

DENR USE ONLY:

Paper Report

Electronic Data - Email CD (data loaded: Yes / No)

Doc/Event #:

NC DENR

Environmental Monitoring Reporting Form

Division of Waste Management - Solid Waste

Notice: This form and any information attached to it are "Public Records" as defined in NC General Statute 132-1. As such, these documents are available for inspection and examination by any person upon request (NC General Statute 132-6).

Instructions:

- Prepare one form for each individually monitored unit.
- Please type or print legibly.
- Attach a notification table with values that attain or exceed NC 2L groundwater standards or NC 2B surface water standards. The notification must include a preliminary analysis of the cause and significance of each value. (e.g. naturally occurring, off-site source, pre-existing condition, etc.).
- Attach a notification table of any groundwater or surface water values that equal or exceed the reporting limits.
- Attach a notification table of any methane gas values that attain or exceed explosive gas levels. This includes any structures on or nearby the facility (NCAC 13B .1629 (4)(a)(i)).
- Send the original signed and sealed form, any tables, and Electronic Data Deliverable to: Compliance Unit, NCDENR-DWM, Solid Waste Section, 1646 Mail Service Center, Raleigh, NC 27699-1646.

Solid Waste Monitoring Data Submittal Information

Name of entity submitting data (laboratory, consultant, facility owner):

Altamont Environmental, Inc. (Consultant)

Contact for questions about data formatting. Include data preparer's name, telephone number and E-mail address:

Name: Andrew Moore

Phone: (828) 281-3350

E-mail: amoore@altamontenvironmental.com

Facility name:	Facility Address:	Facility Permit #	NC Landfill Rule: (.0500 or .1600)	Actual sampling dates (e.g., October 20-24, 2006)
Duke Energy Carolinas, LLC McGuire Nuclear Station Landfill #1 (Unlined)	13339 Hagers Ferry Road Huntersville, NC 28078	6004	.0500	January 16, 2012

Environmental Status: (Check all that apply)

- Initial/Background Monitoring Detection Monitoring Assessment Monitoring Corrective Action

Type of data submitted: (Check all that apply)

- Groundwater monitoring data from monitoring wells Methane gas monitoring data
 Groundwater monitoring data from private water supply wells Corrective action data (specify) _____
 Leachate monitoring data Other(specify) _____
 Surface water monitoring data

Notification attached?

- No. No groundwater or surface water standards were exceeded.
 Yes, a notification of values exceeding a groundwater or surface water standard is attached. It includes a list of groundwater and surface water monitoring points, dates, analytical values, NC 2L groundwater standard, NC 2B surface water standard or NC Solid Waste GWPS and preliminary analysis of the cause and significance of any concentration.
 Yes, a notification of values exceeding an explosive methane gas limit is attached. It includes the methane monitoring points, dates, sample values and explosive methane gas limits.

Certification

To the best of my knowledge, the information reported and statements made on this data submittal and attachments are true and correct. Furthermore, I have attached complete notification of any sampling values meeting or exceeding groundwater standards or explosive gas levels, and a preliminary analysis of the cause and significance of concentrations exceeding groundwater standards. I am aware that there are significant penalties for making any false statement, representation, or certification including the possibility of a fine and imprisonment.

Stuart A. Ryman

P.G.

(828) 281-3350

Facility Representative Name (Print)

Title

(Area Code) Telephone Number

Affix NC Licensed/ Professional Geologist Seal

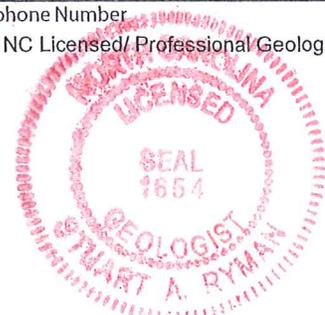
Signature

Date

231 Haywood Street Asheville, NC 28801

Facility Representative Address

NC PE Firm License Number (if applicable effective May 1, 2009)



ALTAMONT ENVIRONMENTAL, INC.

E N G I N E E R I N G & H Y D R O G E O L O G Y



Semiannual Groundwater Monitoring Report

McGuire Nuclear Station

Landfill #1 (Unlined), Permit No. 6004

January 2012 Sampling Event

April 6, 2012

Prepared for
Duke Energy Carolinas, LLC
13339 Hagers Ferry Road
Huntersville, NC 28078
Project #2369.08

Prepared by
Altamont Environmental, Inc.
231 Haywood Street
Asheville, NC 28801
(828) 281-3350

Professional Certification

On behalf of Altamont Environmental, Inc., a firm licensed to practice both engineering (certification number C-2185) and geology (certification number C-299) in the State of North Carolina, I do hereby certify that the information contained in this report is correct and accurate to the best of my knowledge.

A handwritten signature in black ink, appearing to read 'SAR', is written above a horizontal line. The signature is stylized and cursive.

Stuart A. Ryman, P.G.

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1.0 Background

The McGuire Nuclear Station Landfill #1 (Unlined)¹ is located at the Duke Energy Carolinas, LLC (Duke) McGuire Nuclear Station, near Huntersville, North Carolina, in Mecklenburg County. The landfill is closed and no longer accepts waste. The landfill and nearby area are portrayed on Figure 1. The approximate limit of waste is shown on Figure 2.

The landfill is located south of NC Highway 73, east of the Catawba River, and to the west of Cashion Road. Cashion Road runs along a topographic divide, with topography sloping away from Cashion Road to the northwest and to the southeast. Thus, surface water to the northwest of Cashion Road drains towards the Catawba River. There are surface water drainage features to the northeast and southwest of the landfill that eventually merge to the northwest, toward a perennial, unnamed stream.

As described in the Sampling and Analysis Plan² (SAP), the monitoring system at the landfill consists of twelve groundwater monitoring wells and one surface water sample location, as listed below.

Monitoring Wells:	MW-1 MW-1D MW-2A MW-2D MW-3 MW-3D MW-4 MW-4D MW-11 MW-11D MW-12 MW-12D
Surface Water Sample Location:	SW-1

The monitoring wells and the surface water sample location are shown on Figure 2. The wells were installed as well pairs with one shallow well and one deeper well adjacent to each other. The well with the “D” designation is the deeper well in each well pair. The shallow wells are screened to intercept the water table. The deep wells are constructed so that the bottom of the screen is located in residual material just above auger refusal. Monitoring wells MW-1 and MW-1D are located upgradient of the landfill.

¹ In response to the North Carolina Division of Public Health, Radiation Protection Section, November 17, 2006 letter to Duke Energy, LLC, Duke offered to indicate the McGuire Nuclear Station Landfill #1 as “(Unlined)” in reports.

² *McGuire Nuclear Station Landfill #1, Permit Number 60-04, Ground-Water Monitoring Program Sampling and Analysis Plan (SAP)*, September 14, 1996, Revised, November 24, 1997, March 9, 2001.

2.0 Methods

2.1 Sampling and Analysis Methods

Groundwater sampling, surface water sampling, and documentation of sampling activities were performed by Duke personnel following the procedures outlined in the SAP. The groundwater and surface water samples were analyzed by the Duke Analytical Laboratory (North Carolina Laboratory Certification #248) and Pace Analytical Services, Inc. Huntersville (North Carolina Laboratory Certification #12). Radiological analyses were performed by Duke's EnRad Laboratory.

The groundwater and surface water samples were analyzed for the following constituents, in accordance with the SAP:

- Select metals using US Environmental Protection Agency (EPA) Methods 200.7 and 200.8
- Mercury using EPA Method 7470
- Sulfate using EPA Method 300.0
- Volatile organic compounds (VOCs) using EPA Method 8260

The samples were analyzed for the following radiological parameters:

- Gross alpha
- Gross beta
- Tritium

In addition, the following analysis was performed in accordance with the requirements of the Radioactive Materials License No. 060-0379-7 issued by the North Carolina Division of Radiation Protection:

- Gamma radioactivity for select isotopes

2.2 Statement of Work

Altamont Environmental Inc. (Altamont) completed the following tasks:

- Received field sampling information provided by Duke (performed by Duke personnel) for monitoring wells MW-1, MW-1D, MW-2A, MW-2D, MW-3, MW-3D, MW-4, MW-4D, MW-11, MW-11D, MW-12, and MW-12D. Data were also received for surface water sample location SW-1. The samples were collected on January 16, 2012 and Altamont received the data on February 8, 2012.
- Reviewed the laboratory analytical results for the samples. The Electronic Data Deliverable (EDD), provided by Duke, was adapted to conform to the format requirements of the North Carolina Department of Environment and Natural Resources (DENR) EDD template. Altamont added an italicized J data qualifier (*J*) to indicate a detected concentration that is greater than the laboratory's method reporting limit (MRL), but lower than the Solid Waste Section Limit (SWSL). A copy of the original EDD is retained in Altamont's files.
- Developed a generalized groundwater surface contour map using map data and groundwater elevation data supplied by Duke.
- Prepared and submitted this Semiannual Groundwater Monitoring Report to Duke and to DENR.

3.0 Results

3.1 Site Groundwater Flow

Generalized groundwater surface contours for the site are shown on Figure 3. These contours were developed using the groundwater elevations measured in the shallow wells on January 16, 2012.

Groundwater flow at the site is generally from the southeast, near MW-1 and Cashion Road, toward the northwest and MW-3.

3.2 Analytical Results

A summary of the field data is presented in Table 1.

The field and analytical results of groundwater sampling are summarized in Table 2. Results below the heavy black line in Tables 2 and 3 are EPA Method 8260 constituents detected above the method detection limit (MDL) in at least one well or surface water sampling location. EPA Method 8260 constituents not listed were not detected above the MDL.

The field and analytical results of surface water sampling are summarized in Table 3. Surface water sample location SW-1 is located on an unnamed stream. The unnamed stream is a tributary of the Catawba River. The Catawba River is classified by the DENR Division of Water Quality as a Class WS-IV water at its confluence with the unnamed stream. The field and analytical results from these locations are compared to Title 15A, North Carolina Administrative Code (NCAC), Subchapter 2B surface water quality standards (2B standards) for Class WS-IV water.

A summary of the analytical results that equal or exceed the Title 15A, NCAC, Subchapter 2L groundwater quality standards (2L standards) is presented in Table 4.

The MDL was greater than the respective 2L standard for the following constituents:

- 1,1,2,2-Tetrachloroethane
- 1,2,3-Trichloropropane
- 1,2-Dibromo-3-chloropropane
- 1,2-Dibromoethane (EDB)
- Vinyl chloride

The MDL was greater than the respective 2B standard for the following constituents:

- Mercury
- Silver

The MDLs for the abovementioned constituents were all below their corresponding Solid Waste Section Limits (SWSLs). Therefore, in accordance with the DENR February 23, 2007 memo³, the results are considered to be estimated.

The constituents at the following wells were detected at concentrations in excess of their corresponding SWSLs, but less than their 2L standards:

- Barium in MW-1

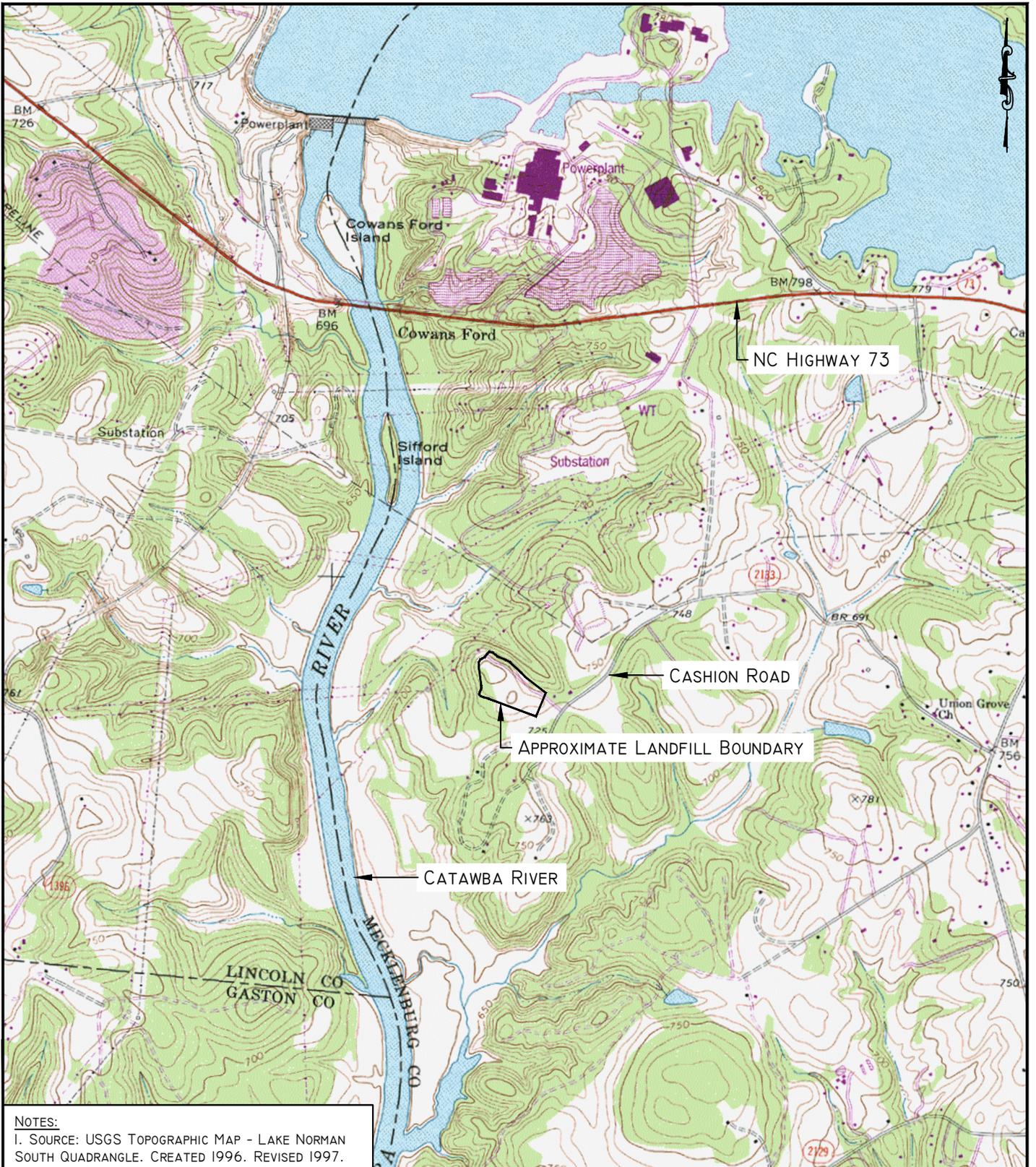
³ DENR Division of Waste Management memo dated February 23, 2007. Re: Addendum to October 27, 2006, North Carolina Solid Waste Section Memorandum Regarding New Guidelines for Electronic Submittal of Environmental Data.

- Methylene chloride in MW-4D
- Trichloroethene in MW-4D

The analytical results for radiological constituents are summarized in Table 5. These results were provided by Duke. A copy of this report is submitted to the DENR Radiation Protection Section for reference.

The chain-of-custody forms can be found in Appendix A.

FIGURES



NOTES:
 I. SOURCE: USGS TOPOGRAPHIC MAP - LAKE NORMAN SOUTH QUADRANGLE. CREATED 1996. REVISED 1997.

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DRAWN BY: ANDREW MOORE
 PROJECT MANAGER: WILLIAM M. MILLER
 CLIENT: DUKE ENERGY CAROLINAS, LLC
 DATE: 02/28/12

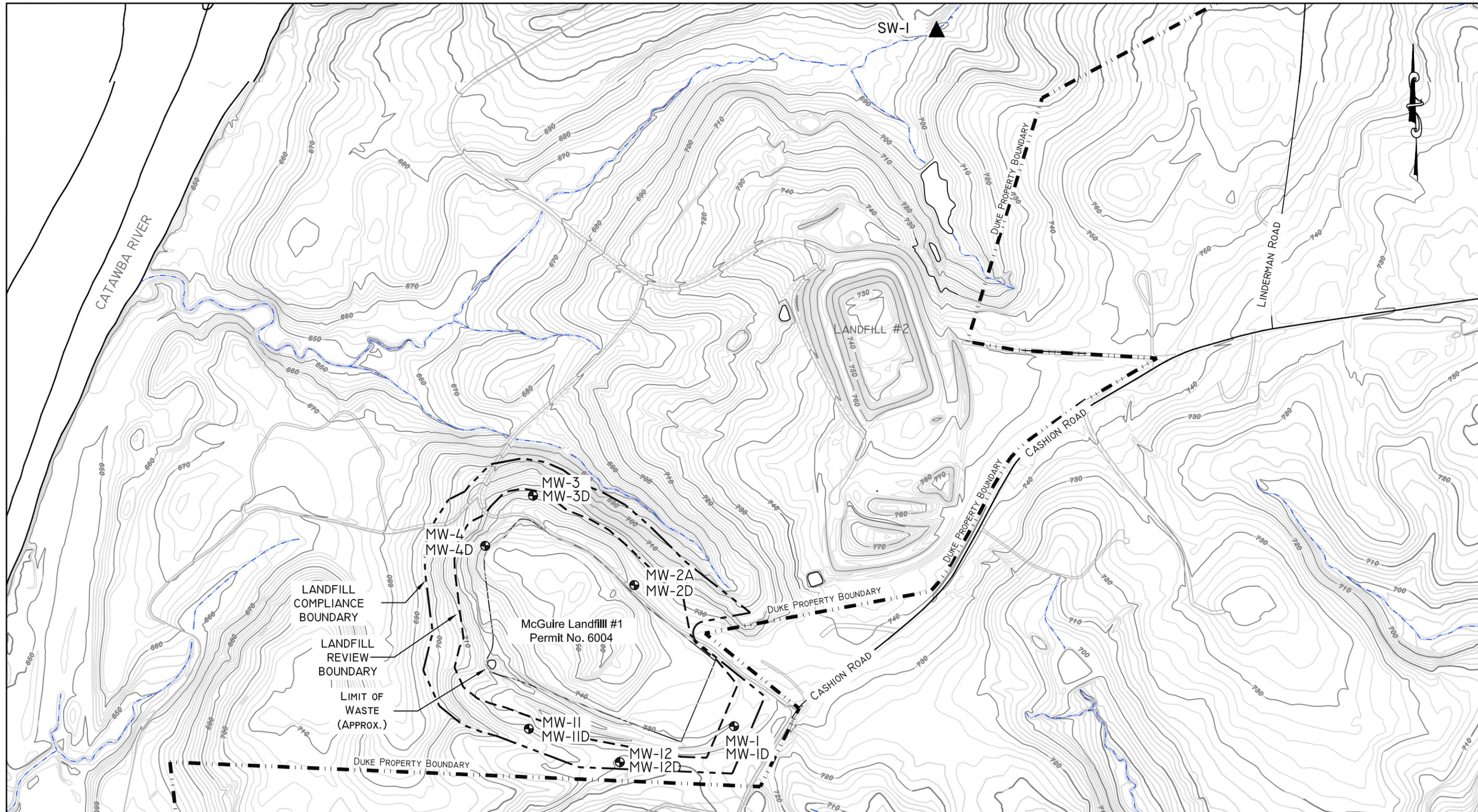


SITE LOCATION MAP

MCUIRE NUCLEAR STATION
 LANDFILL #1 (UNLINED) PERMIT No. 6004

FIGURE

1



	GROUNDWATER MONITORING WELL(S)
	SURFACE WATER SAMPLING LOCATION
	APPROXIMATE LIMIT OF WASTE
	LANDFILL REVIEW BOUNDARY
	LANDFILL COMPLIANCE BOUNDARY
	STREAM

BASE MAP AND STREAM DATA PROVIDED BY DUKE ENERGY CAROLINAS, LLC.

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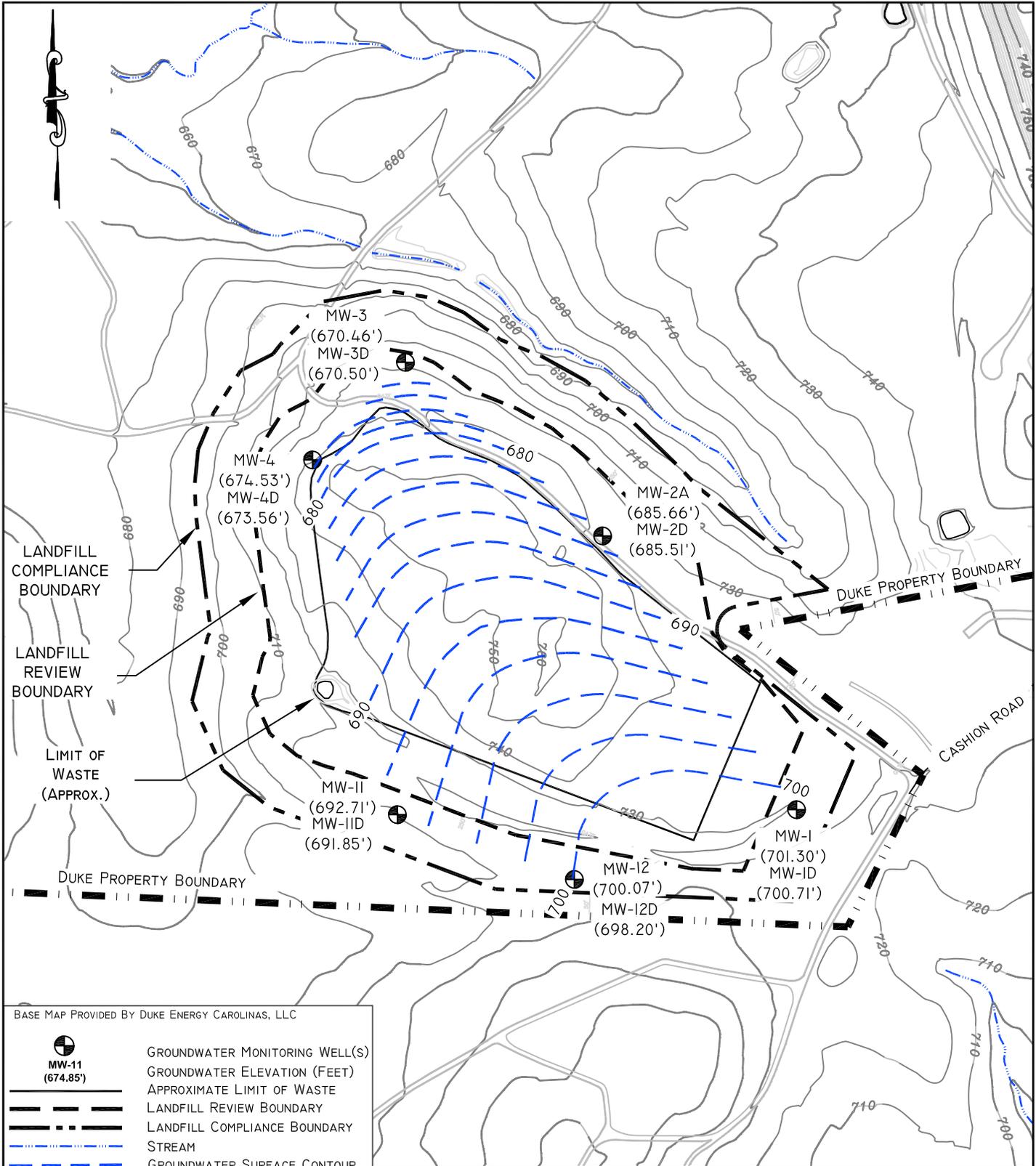
DRAWN BY: ANDREW MOORE
 PROJECT MANAGER: WILLIAM M. MILLER
 CLIENT: DUKE ENERGY CAROLINAS, LLC
 DATE: 03/26/12

SCALE (FEET)
 0 200 400

SAMPLE LOCATIONS

McGUIRE NUCLEAR STATION
 LANDFILL #1 (UNLINED)
 PERMIT No. 6004

FIGURE
2



BASE MAP PROVIDED BY DUKE ENERGY CAROLINAS, LLC

- MW-11 (674.85')
- GROUNDWATER SURFACE CONTOUR
- APPROXIMATE LIMIT OF WASTE
- LANDFILL REVIEW BOUNDARY
- LANDFILL COMPLIANCE BOUNDARY
- STREAM

NOTES:
 1. GROUNDWATER SURFACE CONTOURS DEVELOPED USING GROUNDWATER ELEVATIONS MEASURED IN SHALLOW WELLS ON JANUARY 16, 2012.

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DRAWN BY: ANDREW MOORE
 PROJECT MANAGER: WILLIAM M. MILLER
 CLIENT: DUKE ENERGY CAROLINAS, LLC
 DATE: 3/26/12

SCALE (FEET)
 150 0 150 300

**GENERALIZED
 GROUNDWATER
 SURFACE CONTOURS**
 JANUARY 16, 2012
 MCGUIRE NUCLEAR SATION
 LANDFILL #1 (UNLINED)
 PERMIT No. 6004

FIGURE
3

TABLES

Table 1 - Field Data Parameters
Duke Energy Carolinas, LLC/McGuire Nuclear Station
Landfill #1 (Unlined) - Permit No. 6004

DATE	WELL No.	WELL DEPTH (feet)	DEPTH TO WATER (feet)	WATER ELEV. (feet)	APPEARANCE	ODOR	PURGE METHOD	PUMP RATE (mL/min)	WELL VOLUME (gal)	EVAC VOLUME (gal)	EVAC (yes/no)	TEMP (deg C)	SPECIFIC CONDUCTANCE (umho/cm)	pH (SU)	TURBIDITY (NTU)	ORP (mV-NHE)	DO (mg/L)
1/16/2012	MW-1	69.00	28.99	701.30	Normal	None	CP	N/A	6.53	21.00	No	15.20	101	6.2	5.9	N/A	N/A
1/16/2012	MW-1D	88.60	29.96	700.71	Normal	None	CP	N/A	9.56	30.00	No	15.32	85	6.3	2.9	N/A	N/A
1/16/2012	MW-2A	78.00	54.59	685.66	Normal	None	CP	N/A	3.82	16.00	No	14.99	64	6.5	1.2	N/A	N/A
1/16/2012	MW-2D	110.10	55.28	685.51	Normal	None	CP	N/A	8.94	27.00	No	15.10	59	6.8	1.8	N/A	N/A
1/16/2012	MW-3	71.00	58.58	670.46	Normal	None	CP	N/A	2.03	6.00	No	14.35	71	6.1	2.7	N/A	N/A
1/16/2012	MW-3D	88.88	57.93	670.50	Normal	None	CP	N/A	5.05	15.00	No	14.26	106	6.5	0.8	N/A	N/A
1/16/2012	MW-4	73.95	66.71	674.53	Normal	None	CP	N/A	1.18	1.25	Yes	13.78	179	5.3	1.6	N/A	N/A
1/16/2012	MW-4D	101.48	67.13	673.56	Normal	None	CP	N/A	5.60	23.00	No	14.46	119	6.1	0.7	N/A	N/A
1/16/2012	MW-11	38.54	29.91	692.71	Normal	None	CP	N/A	1.41	2.00	Yes	13.18	15	4.6	51.2	N/A	N/A
1/16/2012	MW-11D	101.80	31.31	691.85	Normal	None	CP	N/A	11.50	20.50	Yes	14.09	29	5.5	10.5	N/A	N/A
1/16/2012	MW-12	29.59	24.76	700.07	Red/Iron	None	CP	N/A	0.79	1.50	No	12.73	19	5.1	135.0	N/A	N/A
1/16/2012	MW-12D	68.56	26.60	698.20	Normal	None	CP	N/A	6.84	21.00	No	13.87	97	6.3	3.3	N/A	N/A
1/16/2012	SW-1	N/A	N/A	N/A	Normal	None	NP	N/A	N/A	N/A	N/A	5.70	108	6.6	12.8	N/A	N/A

Notes:

1. Purge Methods; CP=Conventional Purge (3-5 well volumes), NP=No Purge.
2. Field sampling performed by Duke Energy Carolinas, LLC personnel.
3. umho/cm indicates micro mhos per centimeter.
4. SU indicates Standard Units.
5. NTU indicates Nephelometric Turbidity Units.
6. mV-NHE indicates millivolts-Normal Hydrogen Electrode.
7. Information provided by Tim Hunsucker of Duke Energy Carolinas, LLC on February 8, 2012.

**Table 2 - Groundwater Field and Analytical Results
Duke Energy Carolinas, LLC/McGuire Nuclear Station
Landfill #1 (Unlined) - Permit No. 6004**

Parameter	SWS ID	Units	Certificate Code	Monitoring Wells					SWSL	15A NCAC 2L
				6004 MW-1	6004 MW-1D	6004 MW-2A	6004 MW-2D	6004 MW-3		
Field pH	320	SU	5193	6.2	6.3	6.5	6.8	6.1	-	6.5-8.5
Specific Conductance	323	umho/cm	5193	101	85	64	59	71	-	-
Temperature	325	°C	5193	15.20	15.32	14.99	15.10	14.35	-	-
Top of Casing	328	feet	-	730.29	730.67	740.25	740.79	729.04	-	-
Depth to Water	318	feet	-	28.99	29.96	54.59	55.28	58.58	-	-
Water Elevation	427	feet	-	701.30	700.71	685.66	685.51	670.46	-	-
Well Depth	411	feet	-	69.00	88.60	78.00	110.10	71.00	-	-
Arsenic	14	µg/L	248	0.667 U	0.667 U	0.667 U	0.667 U	0.667 U	10	10
Barium	15	µg/L	248	194	75.04 J	16.39 J	12.94 J	36.55 J	100	700
Cadmium	34	µg/L	248	0.667 U	0.667 U	0.667 U	0.667 U	0.667 U	1	2
Chromium	51	µg/L	248	3.34 U	3.34 U	3.34 U	3.34 U	3.34 U	10	10
Lead	131	µg/L	248	0.667 U	0.667 U	0.667 U	0.667 U	3.82 J	10	15
Mercury	132	µg/L	248	0.0334 U	0.0334 U	0.0334 U	0.0334 U	0.0334 U	0.2	1
Selenium	183	µg/L	248	0.667 U	0.667 U	0.667 U	0.667 U	0.667 U	10	20
Silver	184	µg/L	248	3.34 U	3.34 U	3.34 U	3.34 U	3.34 U	10	20
Sulfate	315	µg/L	248	357 J	312 J	577 J	357 J	481 J	250,000	250,000
Gross Alpha	314	pCi/L	248	0.373	<0.0059	<0.094	<0.0899	<0.183	NE	15
Gross Beta	NE	pCi/L	248	1.84	1.62	0.701	<0.406	<0.231	NE	NE
H3GW (Tritium)	NE	pCi/L	248	<32.3	<-14	<4.67	<49.1	<-12	NE	NE
Carbon disulfide	35	µg/L	12	15.4 J	14.8 J	13.7 J	13.7 J	13 J	100	700
Chloromethane	137	µg/L	12	0.11 U	0.11 J	0.11 U	0.11 U	0.17 J	1	3
cis-1,2-Dichloroethene	78	µg/L	12	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	5	70
Methylene chloride	140	µg/L	12	0.97 U	0.97 U	0.97 U	0.97 U	0.97 U	1	5
Tetrachloroethene	192	µg/L	12	0.46 U	0.46 U	0.46 U	0.46 U	0.46 U	1	0.7
Trichloroethene	201	µg/L	12	0.47 U	0.47 U	0.47 U	0.47 U	0.47 U	1	3
Trichlorofluoromethane	203	µg/L	12	0.2 U	0.2 U	0.2 U	0.2 U	0.52 J	1	2,000
o-Xylene	408	µg/L	12	0.23 U	0.23 U	0.23 U	0.23 U	0.23 U	NE	500*
Xylene (total)	346	µg/L	12	0.66 U	0.66 U	0.66 U	0.66 U	0.66 U	5	500

Notes:

- Concentrations presented in micrograms per liter (µg/L).
- SWS ID is the Solid Waste Section Identification Number.
- SWSL is the Solid Waste Section Limit. DENR defines the SWSL as the lowest amount of analyte in a sample that can be quantitatively determined with suitable precision and accuracy.
- 15A NCAC 2L standard is from "North Carolina Administrative Code, Title 15A: Department of Environment and Natural Resources, Subchapter 2L - Groundwater Classifications and Standards," DENR (last amended on January 1, 2010).
- NE indicates not established. Blank cells indicate that there is no information relevant to the respective row.
- Grayed values indicate values that attain or exceed the SWSL standard.
- Bold values indicate values that attain or exceed the 15A NCAC 2L standard.
- Qualifiers in non-italicized text are laboratory data qualifiers or "flags". "U" is used for parameters not detected at concentrations above the method detection limit (MDL). "J" is used for parameters detected at estimated concentrations above the MDL but below the laboratory's method reporting limit (MRL). An italicized J-flag is a data qualifier, added by Altamont, to indicate a detected concentration that is greater than the laboratory's MRL but less than the SWSL.
- Data obtained from Electronic Data Deliverable (EDD) provided by Tim Hunsucker of Duke Energy Carolinas, LLC on February 8, 2012.
- NA indicates not analyzed.
- * The 2L standard for Xylenes-Total used.

**Table 2 - Groundwater Field and Analytical Results
Duke Energy Carolinas, LLC/McGuire Nuclear Station
Landfill #1 (Unlined) - Permit No. 6004**

Parameter	SWS ID	Units	Certificate Code	Monitoring Wells					SWSL	15A NCAC 2L
				6004 MW-3D	6004 MW-4	6004 MW-4D	6004 MW-11	6004 MW-11D		
Field pH	320	SU	5193	6.5	5.3	6.1	4.6	5.5	-	6.5-8.5
Specific Conductance	323	umho/cm	5193	106	179	119	15	29	-	-
Temperature	325	°C	5193	14.26	13.78	14.46	13.18	14.09	-	-
Top of Casing	328	feet	-	728.43	741.24	740.69	722.62	723.16	-	-
Depth to Water	318	feet	-	57.93	66.71	67.13	29.91	31.31	-	-
Water Elevation	427	feet	-	670.50	674.53	673.56	692.71	691.85	-	-
Well Depth	411	feet	-	88.88	73.95	101.48	38.54	101.80	-	-
Arsenic	14	µg/L	248	0.667 U	0.667 U	0.667 U	0.667 U	0.667 U	10	10
Barium	15	µg/L	248	20.81 J	62.97 J	20.4 J	6 J	10.58 J	100	700
Cadmium	34	µg/L	248	0.667 U	0.667 U	0.667 U	0.667 U	0.667 U	1	2
Chromium	51	µg/L	248	3.34 U	3.34 U	3.34 U	3.34 U	3.34 U	10	10
Lead	131	µg/L	248	0.667 U	0.667 U	0.667 U	0.667 U	0.667 U	10	15
Mercury	132	µg/L	248	0.0334 U	0.0334 U	0.0334 U	0.0334 U	0.0334 U	0.2	1
Selenium	183	µg/L	248	0.667 U	0.667 U	0.667 U	0.667 U	0.667 U	10	20
Silver	184	µg/L	248	3.34 U	3.34 U	3.34 U	3.34 U	3.34 U	10	20
Sulfate	315	µg/L	248	841 J	1,039 J	340 J	533 J	686 J	250,000	250,000
Gross Alpha	314	pCi/L	248	<0.0933	<0.11	0.400	0.511	<0.123	NE	15
Gross Beta	NE	pCi/L	248	1.52	0.605	0.732	<0.404	<0.125	NE	NE
H3GW (Tritium)	NE	pCi/L	248	<-59	<65.7	<16.4	<32.9	<-14	NE	NE
Carbon disulfide	35	µg/L	12	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	100	700
Chloromethane	137	µg/L	12	0.12 J	0.14 J	0.2 J	0.18 J	0.11 U	1	3
cis-1,2-Dichloroethene	78	µg/L	12	0.4 J	1.2 J	3.5 J	0.19 U	0.19 U	5	70
Methylene chloride	140	µg/L	12	0.97 U	0.97 U	1.4	0.97 U	0.97 U	1	5
Tetrachloroethene	192	µg/L	12	0.46 U	1.8	0.77 J	0.46 U	0.46 U	1	0.7
Trichloroethene	201	µg/L	12	0.47 U	0.73 J	2.2	0.47 U	0.47 U	1	3
Trichlorofluoromethane	203	µg/L	12	0.42 J	0.2 U	0.2 U	0.2 U	0.2 U	1	2,000
o-Xylene	408	µg/L	12	0.23 U	0.23 U	3.6	0.23 U	0.23 U	NE	500*
Xylene (total)	346	µg/L	12	0.66 U	0.66 U	3.8 J	0.66 U	0.66 U	5	500

Notes:

- Concentrations presented in micrograms per liter (µg/L).
- SWS ID is the Solid Waste Section Identification Number.
- SWSL is the Solid Waste Section Limit. DENR defines the SWSL as the lowest amount of analyte in a sample that can be quantitatively determined with suitable precision and accuracy.
- 15A NCAC 2L standard is from "North Carolina Administrative Code, Title 15A: Department of Environment and Natural Resources, Subchapter 2L - Groundwater Classifications and Standards," DENR (last amended on January 1, 2010).
- NE indicates not established. Blank cells indicate that there is no information relevant to the respective row.
- Grayed values indicate values that attain or exceed the SWSL standard.
- Bold values indicate values that attain or exceed the 15A NCAC 2L standard.
- Qualifiers in non-italicized text are laboratory data qualifiers or "flags". "U" is used for parameters not detected at concentrations above the method detection limit (MDL). "J" is used for parameters detected at estimated concentrations above the MDL but below the laboratory's method reporting limit (MRL). An italicized J-flag is a data qualifier, added by Altamont, to indicate a detected concentration that is greater than the laboratory's MRL but less than the SWSL.
- Data obtained from Electronic Data Deliverable (EDD) provided by Tim Hunsucker of Duke Energy Carolinas, LLC on February 8, 2012.
- NA indicates not analyzed.
- * The 2L standard for Xylenes-Total used.

**Table 2 - Groundwater Field and Analytical Results
Duke Energy Carolinas, LLC/McGuire Nuclear Station
Landfill #1 (Unlined) - Permit No. 6004**

Parameter	SWS ID	Units	Certificate Code	Monitoring Wells		Trip Blank	Field Blank	SWSL	15A NCAC 2L
				6004 MW-12	6004 MW-12D				
Field pH	320	SU	5193	5.1	6.3	-	-	-	6.5-8.5
Specific Conductance	323	umho/cm	5193	19	97	-	-	-	-
Temperature	325	°C	5193	12.73	13.87	-	-	-	-
Top of Casing	328	feet	-	724.83	724.80	-	-	-	-
Depth to Water	318	feet	-	24.76	26.60	-	-	-	-
Water Elevation	427	feet	-	700.07	698.20	-	-	-	-
Well Depth	411	feet	-	29.59	68.56	-	-	-	-
Arsenic	14	µg/L	248	0.667 U	0.667 U	NA	0.667 U	10	10
Barium	15	µg/L	248	13.62 J	11.32 J	NA	3.34 U	100	700
Cadmium	34	µg/L	248	0.667 U	0.667 U	NA	0.667 U	1	2
Chromium	51	µg/L	248	3.34 U	3.34 U	NA	3.34 U	10	10
Lead	131	µg/L	248	0.667 U	0.667 U	NA	0.667 U	10	15
Mercury	132	µg/L	248	0.036 J	0.0334 U	NA	0.0334 U	0.2	1
Selenium	183	µg/L	248	0.667 U	0.667 U	NA	0.667 U	10	20
Silver	184	µg/L	248	3.34 U	3.34 U	NA	3.34 U	10	20
Sulfate	315	µg/L	248	106 J	117 J	NA	18 U	250,000	250,000
Gross Alpha	314	pCi/L	248	0.317	<0.050	NA	NA	NE	15
Gross Beta	NE	pCi/L	248	1.31	0.681	NA	NA	NE	NE
H3GW (Tritium)	NE	pCi/L	248	<51.4	<32.7	NA	NA	NE	NE
Carbon disulfide	35	µg/L	12	1.2 U	1.2 U	73 J	1.2 U	100	700
Chloromethane	137	µg/L	12	0.14 J	0.22 J	0.13 J	0.11 U	1	3
cis-1,2-Dichloroethene	78	µg/L	12	0.19 U	0.19 U	0.19 U	0.19 U	5	70
Methylene chloride	140	µg/L	12	0.97 U	0.97 U	0.97 U	0.97 U	1	5
Tetrachloroethene	192	µg/L	12	0.46 U	0.46 U	0.46 U	0.46 U	1	0.7
Trichloroethene	201	µg/L	12	0.47 U	0.47 U	0.47 U	0.47 U	1	3
Trichlorofluoromethane	203	µg/L	12	0.2 U	0.2 U	0.2 U	0.2 U	1	2,000
o-Xylene	408	µg/L	12	0.23 U	0.23 U	0.23 U	0.23 U	NE	500*
Xylene (total)	346	µg/L	12	0.66 U	0.66 U	0.66 U	0.66 U	5	500

Notes:

- Concentrations presented in micrograms per liter (µg/L).
- SWS ID is the Solid Waste Section Identification Number.
- SWSL is the Solid Waste Section Limit. DENR defines the SWSL as the lowest amount of analyte in a sample that can be quantitatively determined with suitable precision and accuracy.
- 15A NCAC 2L standard is from "North Carolina Administrative Code, Title 15A: Department of Environment and Natural Resources, Subchapter 2L - Groundwater Classifications and Standards," DENR (last amended on January 1, 2010).
- NE indicates not established. Blank cells indicate that there is no information relevant to the respective row.
- Grayed values indicate values that attain or exceed the SWSL standard.
- Bold values indicate values that attain or exceed the 15A NCAC 2L standard.
- Qualifiers in non-italicized text are laboratory data qualifiers or "flags". "U" is used for parameters not detected at concentrations above the method detection limit (MDL). "J" is used for parameters detected at estimated concentrations above the MDL but below the laboratory's method reporting limit (MRL). An italicized J-flag is a data qualifier, added by Altamont, to indicate a detected concentration that is greater than the laboratory's MRL but less than the SWSL.
- Data obtained from Electronic Data Deliverable (EDD) provided by Tim Hunsucker of Duke Energy Carolinas, LLC on February 8, 2012.
- NA indicates not analyzed.
- * The 2L standard for Xylenes-Total used.

**Table 3 - Surface Water Field and Analytical Results
Duke Energy Carolinas, LLC/McGuire Nuclear Station
Landfill #1 (Unlined) - Permit No. 6004**

Parameter	SWS ID	Units	Certificate Code	SW-1	SWSL	15A NCAC 2B
Field pH	320	SU	5193	6.6	-	6.0-9.0
Specific Conductance	323	umho/cm	5193	108	-	-
Temperature	325	°C	5193	5.70	-	-
Arsenic	14	µg/L	248	0.667 U	10	10
Barium	15	µg/L	248	30.22 J	100	1,000
Cadmium	34	µg/L	248	0.667 U	1	2*
Chromium	51	µg/L	248	3.34 U	10	50*
Lead	131	µg/L	248	0.667 U	10	25*
Mercury	132	µg/L	248	0.0334 U	0.2	0.012*
Selenium	183	µg/L	248	0.667 U	10	5*
Silver	184	µg/L	248	3.34 U	10	0.06*
Sulfate	315	µg/L	248	1,799 J	250,000	250,000
Gross Alpha	314	pCi/L	248	<0.0924	NE	NE
Gross Beta	NE	pCi/L	248	1.20	NE	NE
H3GW (Tritium)	NE	pCi/L	248	<81.8	NE	NE
Carbon disulfide	35	µg/L	12	1.2 U	100	LD
Chloromethane	137	µg/L	12	0.17 J	1	2.6*
cis-1,2-Dichloroethene	78	µg/L	12	0.19 U	5	330*
Methylene chloride	140	µg/L	12	0.97 U	1	4.6*
Tetrachloroethene	192	µg/L	12	0.46 U	1	0.7
Trichloroethene	201	µg/L	12	0.47 U	1	2.5
Trichlorofluoromethane	203	µg/L	12	0.2 U	1	9100*
o-Xylene	408	µg/L	12	0.23 U	NE	800*
Xylene (total)	346	µg/L	12	0.66 U	5	670*

Notes:

- Concentrations presented in micrograms per liter (µg/L) or picoCuries per liter (pCi/L).
- SWS ID is the Solid Waste Section Identification Number.
- SWSL is the Solid Waste Section Limit. DENR defines the SWSL as the lowest amount of analyte in a sample that can be quantitatively determined with suitable precision and accuracy.
- 15A NCAC 2B standard is from "North Carolina Administrative Code, Title 15A: Department of Environment and Natural Resources, Subchapter 2B - Surface Water and Wetland Standards," (last amended on May 1, 2007) for Class WS-IV water.
- * Indicates that no 2B standard exists for Class WS-IV water. Where no 2B standard exists, the NC and EPA Criteria Table for Water Supply water used.
NC and EPA Criteria Table downloaded from DENR website at <http://portal.ncdenr.org/web/wq/ps/csu/swstandards> (Downloaded 8/26/2011). The table is dated 2/5/2010.
- NE indicates not established. Blank cells indicate that there is no information relevant to the respective row.
- Grayed values indicate values that attain or exceed the SWSL standard.
- Bold values indicate values that attain or exceed the 15A NCAC 2B standard.
- NE means not established. Blank cells indicate that there is no information relevant to the respective row.
- LD from NC and EPA Criteria Table and indicates limited data available.
- Qualifiers in non-italicized text are laboratory data qualifiers or "flags". "U" is used for parameters not detected at concentrations above the method detection limit (MDL). "J" is used for parameters detected at estimated concentrations above the MDL but below the laboratory's method reporting limit (MRL). An italicized J-flag is a data qualifier, added by Altamont, to indicate a detected concentration that is greater than the laboratory's MRL but less than the SWSL.
- Data obtained from Electronic Data Deliverable (EDD) provided by Tim Hunsucker of Duke Energy Carolinas on February 8, 2012.

**Table 4 - Field and Analytical Results that Equal or Exceed
NCAC 2L Groundwater Quality Standards
Duke Energy Carolinas, LLC/McGuire Nuclear Station
Landfill #1 (Unlined) - Permit No. 6004**

Sample Date: January 16, 2012						
Field sampling performed by Duke Energy Carolinas, LLC						
Parameter	Well ID	Result	Units	15A NCAC 2L Standard	Historical Concentrations	Cause and Significance
pH	MW-1	6.2	SU	6.5 - 8.5	6.0 - 7.0	pH consistent with historic readings at MW-1.
	MW-1D	6.3			5.9 - 7.0	pH consistent with historic readings at MW1-D.
	MW-2A	6.5			5.7 - 7.4	pH consistent with historic readings at MW-2A.
	MW-3	6.1			5.7 - 7.5	pH consistent with historic readings at MW-3.
	MW-3D	6.5			6.1 - 7.1	pH consistent with historic readings at MW-3D.
	MW-4	5.3			5.4 - 8.1	pH at MW-4 lowest since sampling began.
	MW-4D	6.1			6.1 - 7.1	pH consistent with historic readings at MW-4D.
	MW-11	4.6			4.4 - 5.3	pH consistent with historic readings at MW-11.
	MW-11D	5.5			5.5 - 6.2	pH consistent with historic readings at MW-11D.
	MW-12	5.1			5.0 - 5.6	pH consistent with historic readings at MW-12.
	MW-12D	6.3			6.2 - 7.4	pH consistent with historic readings at MW-12D.
	Tetrachlorethene	MW-4			1.8	µg/L
MW-4D		0.77	0.52 - <2.0			

Notes:

1. 15A NCAC 2L standard is from "North Carolina Administrative Code, Title 15A: Department of Environment and Natural Resources, Subchapter 2L - Groundwater Classifications and Standards," DENR (last amended on January 1, 2010).
2. Data obtained from Electronic Data Deliverable (EDD) provided by Tim Hunsucker of Duke Energy Carolinas, LLC on February 8, 2012.
3. Historical concentrations based on data in Duke Energy Carolinas, LLC analytical results database.

Table 5 - Radiological Analytical Results
Duke Energy Carolinas, LLC/McGuire Nuclear Station
Landfill # 1 (Unlined) - Permit No. 6004

Sample Date: January 16, 2012 Laboratory Certification Code
Duke Energy Analytical Laboratory #248
 Field Sampling Performed by Duke Energy Carolinas, LLC

Parameter	Units	Certificate Code	Monitoring Wells												SW-1
			MW-1	MW-1D	MW-2A	MW-2D	MW-3	MW-3D	MW-4	MW-4D	MW-11	MW-11D	MW-12	MW-12D	
Alpha	pCi/L	248	0.373	<-0.0059	<-0.094	<-0.0899	<0.183	<0.0933	<-0.11	0.400	0.511	<0.123	0.317	<-0.050	<0.0924
BaLa-140	pCi/L	248	<4.81	<6.19	<7.08	<6.61	<4.51	<6.87	<4.63	<4.18	<6.12	<4.46	<5.09	<7.09	<4.04
Be-7	pCi/L	248	<31.7	<37.4	<43.0	<39.2	<28.3	<44.8	<39.2	<29.8	<33.2	<34.4	<30.4	<41.6	<30.6
Beta	pCi/L	248	1.84	1.62	0.701	<0.406	<0.231	1.52	0.605	0.732	<0.404	<0.125	1.31	0.681	1.20
Co-58	pCi/L	248	<3.48	<4.85	<5.12	<3.89	<3.27	<5.59	<4.21	<3.31	<4.81	<3.63	<3.69	<4.38	<3.61
Co-60	pCi/L	248	<4.60	<5.64	<6.85	<5.83	<4.77	<6.35	<3.94	<5.29	<5.42	<6.22	<5.47	<6.07	<4.77
Cs-134	pCi/L	248	<3.77	<4.52	<3.99	<3.66	<3.58	<4.99	<4.21	<3.40	<4.39	<3.96	<3.48	<4.76	<3.92
Cs-137	pCi/L	248	<3.82	<4.22	<5.32	<4.70	<4.32	<5.78	<4.79	<4.02	<5.01	<4.46	<4.72	<5.32	<3.71
Fe-59	pCi/L	248	<6.40	<8.32	<9.76	<10.4	<6.76	<9.77	<8.48	<5.89	<11.7	<8.45	<8.26	<7.74	<7.81
H3GW	pCi/L	248	<32.3	<14	<4.67	<49.1	<12	<59	<65.7	<16.4	<32.9	<14	<51.4	<32.7	<81.8
I-131	pCi/L	248	<3.80	<4.95	<4.92	<4.60	<4.01	<6.24	<4.29	<3.94	<4.30	<4.49	<4.36	<5.15	<3.65
K-40	pCi/L	248	41.4	102	49.7	69.4	62.8	212	137	<65.2	89.8	231	71.4	96.4	72.9
Mn-54	pCi/L	248	<3.55	<4.41	<5.59	<4.60	<3.76	<5.45	<4.90	<3.91	<4.50	<4.00	<4.33	<4.60	<3.23
Nb-95	pCi/L	248	<4.31	<5.25	<4.70	<4.81	<3.58	<5.46	<4.95	<3.26	<5.70	<3.94	<4.02	<5.23	<3.36
Zn-65	pCi/L	248	<7.70	<9.37	<9.05	<7.48	<8.69	<9.18	<9.36	<8.67	<8.96	<9.41	<8.24	<9.32	<8.27
Zr-95	pCi/L	248	<6.22	<7.71	<6.74	<7.00	<6.86	<9.31	<6.88	<5.75	<8.78	<7.23	<6.48	<9.12	<7.02

Notes:

1. Concentrations presented in picocuries per liter (pCi/L).
2. Data obtained from EnRad Laboratory Report (Job: MCGUIRE_12DEC2011_A) provided by Tim Hunsucker of Duke Energy Carolinas, LLC on February 8, 2012.

APPENDIX A
Chain-of-Custody Forms



For Detailed Instructions, see:
http://dewwww/lessenv/coc/

Duke Energy Analytical Lab Services
Mail Code MGO3A2 (Building 7405)
13339 Hagers Ferry Rd
Huntersville, N. C. 28078
(704) 875-5245
Fax: (704) 875-5038

CHAIN OF CUSTODY RECORD AND ANALYSIS REQUEST FORM

19 Page 1 of 1
DISTRIBUTION
ORIGINAL to LAB,
COPY to CLIENT

Rev 11/10/11

Customer must Complete

1) Project Name MNS Landfill 1 # 60-04		Permit	2) Phone No: 875-5257	
3) Client C. Campbell / T. Hunsucker			4) Fax No: 875-4349	
5) Business Unit: 20036	6) Process: BLDFLGN	7) Resp. To: MC00		
8) Project ID:	9) Activity ID:	10) Mail Code:		

Analytical Laboratory Use Only		Samples Originating From	NC <input checked="" type="checkbox"/> SC <input type="checkbox"/>
LIMS # J12010129	MATRIX GW_RCRA	SAMPLE PROGRAM	
Logged By cpt	Date & Time 1-17-12 0802	Groundwater <input checked="" type="checkbox"/>	NPDES <input type="checkbox"/>
Vendor	1.2	Drinking Water <input type="checkbox"/>	UST <input type="checkbox"/>
	COOLER	RCRA Waste <input type="checkbox"/>	

PO #	PACE PO #146146	15 Preserv.: 1=HCL 2=H ₂ SO ₄ 3=HNO ₃ 4=Ice 5=None	3	3	3	3	3	3	1,4	20 Total # of Containers				
MR #														
Customer to complete all appropriate NON-SHADED areas.						16 Analyses Required	17 Comp.	18 Grab	ALK (4.5), SO ₄ , Cl (IC) 4	Hg (7470)	Metals Prep - 3030C (ICP-EPA-200.7) Ag, Ba, Ca, Cr, K, Mg, Na	(IMS-EPA-200.8) As, Cd, Pb, Se	VOCs (EPA 8260B) (See Attached List)	Chlorene (pm)

LAB USE ONLY	11 Lab ID
	2012000642
	2012000643
	2012000644
	2012000645
	2012000646
	2012000647
	2012000648
	2012000649
	2012000650
	2012000651
	2012000652
	2012000653
	2012000654
	2012000655
	2012000656

Customer to complete appropriate columns to right

12 Chem Desktop No.	13 Sample Description or ID	14 Collection Information		
		Date	Time	Signature
	TRIP BLANK	1/16/12	0515	WC
	MW-1	1/16/12	1215	WC
	MW-1D	1/16/12	1230	WC
	MW-2A	1/16/12	1130	RW
	MW-2D	1/16/12	1145	RW
	MW-3	1/16/12	0945	RW
	MW-3D	1/16/12	0955	RW
	MW-4	1/16/12	0800	RW
	MW-4D	1/16/12	0830	RW
	MW-11	1/16/12	0800	WC
	MW-11D	1/16/12	0855	WC
	MW-12	1/16/12	0945	WC
	MW-12D	1/16/12	1040	WC
	SW-1	1/16/12	1300	WC
	FIELD BLANK	1/16/12	1330	WC

Customer to sign & date below

21) Relinquished By LO GLU	Date/Time 1/17/12 0720	Accepted By Candy Knot	Date/Time 1-17-12 0720
Relinquished By Candy Knot	Date/Time 1-17-12 1043	Accepted By [Signature]	Date/Time 1-17-12 1043
Relinquished By	Date/Time	Accepted By	Date/Time
23) Seal/Locked By	Date/Time	Sealed/Lock Opened By	Date/Time
24) Comments			

Customer, important please indicate desired turnaround

22 Requested Turnaround

14 Days

*7 Days _____

*48 Hr _____

*Other _____

* Add. Cost Will Apply

