Dare County C&D Landfill Facility Permit No. 28-03 Semi-Annual Sampling Report

(September 2013 Sampling Event)

Dare County

Report

November 2013

CDM Smith

DENR USE ONLY: ☐ Paper Report ☐ Electronic Data - Email CD (data loaded: Yes / No) Doc/Event #:

NC DENR
Division of Waste Management - Solid Waste

Environmental Monitoring Reporting Form

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):

Consultant - CDM Smith Inc.

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

Name: Mathew F. Colone Phone: 919-787-5620

E-mail: colonemf@cdmsmith.com

Facility name:	Facility Address:	Facility Permit #	NC Landfill Rule: (.0500 or .1600)	Actual sampling dates (e.g., October 20-24, 2006)
Dare County C&D Landfill	1603 Cub Road Manns Harbor, NC 27953	28-03	.0500	September 30, 2013

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

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.

Mathew F. Colone — Consultant — (919) 787-5620

Facility Representative Name (Print) — Title — (Area Code) Telephone Number

Signature — 11/20/2013 Date — Affix NC Licensed/Professional Geologist Seal

NORTH CAROLINA LICENSED SEAL 1851 GEOLOGIST MATHEW F. COLONE

11/20/2013

5400 Glenwood Ave, Suite 300, Raleigh, NC 27612

Facility Representative Address

F-0412

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

Revised 6/2009

5400 Glenwood Avenue, Suite 300
Raleigh, North Carolina 27612
tel: 919 787-5620
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November 20, 2013

Ms. Jaclynne Drummond
North Carolina Department of Environment and
Natural Resources
Division of Waste Management
Solid Waste Section
1646 Mail Service Center
Raleigh, North Carolina 27699-1646

Subject: September 2013 Semi-Annual Monitoring Sampling Report
Dare County C&D Landfill
Facility Permit No. 28-03

Dear Ms. Drummond:

CDM Smith Inc., on behalf of Dare County, is submitting an electronic copy of the September 2013 semi-annual sampling event report. This letter report presents the results of the most recent semi-annual sampling event that was completed at the Dare County C&D Landfill and constitutes the second semi-annual sampling event for 2013. The approved groundwater monitoring network consists of 13 wells (i.e. MW-1, -2, -3, -8, -9, -10, -11, -12, -13, -14, -15, -16, and -17) and 3 surface water sampling locations (i.e. SW-1, -2, and -3). Field activities and sampling results are discussed below.

Field Activities

Groundwater and surface water samples from the Dare County C&D Landfill were collected on September 30, 2013 by Environment One, Inc. (Environment One). Monitoring wells and surface water sample locations are shown on **Figure 1**. Groundwater elevations were measured at each well prior to sampling using an electronic water level indicator with an accuracy of 0.01 feet. These groundwater elevations as presented in **Table 1** were used to construct a potentiometric surface map for this sampling event. The potentiometric contours are presented on **Figure 1**.

Each well was measured in the field for pH, conductivity, temperature, turbidity, dissolved oxygen (DO), and oxidation-reduction potential (ORP) prior to sampling with the exception of wells MW-13 through MW-17. The DO and ORP sensors in the water quality meter failed prior to purging monitoring wells MW-13 through MW-17. The water quality parameters at the time samples were collected are presented in **Table 1**.

Sampling Results

Environment One located in Greenville, North Carolina analyzed the groundwater and surface water samples for North Carolina Appendix I volatile organic compounds (VOCs) by U.S. Environmental Protection Agency (EPA) Method 8260B, metals by EPA Method 200.8 and Standard Method (SM) 3111B, mercury by EPA Method 245.1, alkalinity by SM 2320B, chloride by SM 4500-CLB, sulfate by SM 4500-SO4, and total dissolved solids by SM 2540C. Note that analytical results for total dissolved solids are provided in **Table 1**. In accordance with Solid Waste Section guidelines, the analytical results were reported to the laboratory specific method detection limit (MDL) and are quantifiable at or below Solid Waste Section Limits (SWSLs). All monitoring wells and surface water sample locations for the C&D Landfill had detections of analytes above the MDL with a majority of the detections below SWSLs. These detections were qualified as estimated or "J" flags.

The following list presents the analytes detected above the MDL at each sample location. No "J" flag detections are provided. Underlined analytes exceeded the North Carolina 2L Standard, Groundwater Protection Standard, or the North Carolina Surface Water Standards for Class C Waters. A complete summary of all detected and estimated concentrations for the September 2013 sampling event is presented in **Table 2**. A copy of the laboratory report is provided in **Appendix A**.

MW-1

Inorganics:	Alkalinity, <u>Chloride</u>
Metals:	<u>Iron</u>, <u>Manganese</u>
Volatile Organic Compounds:	None Detected

MW-2

Inorganics:	Alkalinity, Chloride
Metals:	<u>Iron</u>, <u>Manganese</u>
Volatile Organic Compounds:	None Detected

MW-3

Inorganics:	Alkalinity, Chloride
Metals:	<u>Iron</u>, <u>Manganese</u>
Volatile Organic Compounds:	None Detected

MW-8

Inorganics:	Alkalinity, <u>Chloride</u>
Metals:	Barium, <u>Iron</u>, <u>Manganese</u>, Selenium
Volatile Organic Compounds:	None Detected

MW-9

Inorganics:	Alkalinity, Chloride
Metals:	Arsenic, Iron, Zinc
Volatile Organic Compounds:	None Detected

MW-10

Inorganics:	Alkalinity, Chloride, Sulfate
Metals:	Iron, Manganese
Volatile Organic Compounds:	None Detected

MW-11

Inorganics:	Alkalinity, Chloride, Sulfate
Metals:	Iron, Manganese
Volatile Organic Compounds:	None Detected

MW-12

Inorganics:	Alkalinity, Chloride
Metals:	Iron
Volatile Organic Compounds:	None Detected

MW-13

Inorganics:	Alkalinity, Chloride
Metals:	Iron, Manganese
Volatile Organic Compounds:	None Detected

MW-14

Inorganics:	Alkalinity, Chloride, Sulfate
Metals:	Arsenic, Iron, Manganese
Volatile Organic Compounds:	None Detected

MW-15

Inorganics:	Alkalinity, Chloride
Metals:	Arsenic, Iron, Manganese, Zinc
Volatile Organic Compounds:	None Detected

MW-16

Inorganics:	Alkalinity, Chloride, Sulfate
Metals:	Barium, Iron, Manganese, Selenium
Volatile Organic Compounds:	None Detected

MW-17

Inorganics:	Alkalinity, Chloride
Metals:	Iron, Manganese, Zinc
Volatile Organic Compounds:	None Detected

SW-1

Inorganics:	Alkalinity, Chloride
Metals:	Iron, Manganese
Volatile Organic Compounds:	None Detected

SW-2

Inorganics:	Alkalinity, Chloride
Metals:	Iron, Manganese
Volatile Organic Compounds:	None Detected

SW-3

Inorganics:	Alkalinity, Chloride
Metals:	Iron, Manganese, Zinc
Volatile Organic Compounds:	None Detected

"J" flags were not included in the previous list, but several locations had "J" flag detections that exceeded the standards. The "J" flag constituents above the standards along with their locations are listed below.

Cobalt:	MW-9
Mercury:	SW-1, -2, and -3
Vanadium:	MW-1, -2, -3, -8, -9, -10, -11, -12, -13, -14, -15, -16, and -17

No analytes were detected in the trip blank. Metals were detected in the equipment blank below NC 2L Standards. A duplicate sample was collected from MW-8 and had analytes detected at similar concentrations to the parent sample.

The semi-annual groundwater monitoring program will be continued by Dare County. The first semi-annual sampling event for 2014 is tentatively scheduled for February. If you have any questions or require further explanation, do not hesitate to call me at (919) 787-5620.

Very truly yours,

Mathew F. Colone, P.G.
CDM Smith Inc.

Attachments

cc: Edward Mann, Dare County

Table 1
Water Quality Field Parameters
September 2013 Semi-Annual Sampling Event
Dare County C&D Landfill

		Water Quality Parameters							Groundwater Elevations - 9/30/13		
Facility Permit Number	Monitoring Well Code	pH (S.U.)	Conductivity (µS/cm)	Temperature (deg.C)	Turbidity (NTUs)	Dissolved Oxygen (mg/l)	Oxidation-Reduction Potential (mV)	TDS (mg/L)	TOC Elevation (feet AMSL)	Depth to Groundwater (feet)	Groundwater Elevation (feet AMSL)
28-03	MW-1	6.8	3,608	20	22	1.04	-75.3	1,120	1.61	2.33	-0.72
28-03	MW-2	6.8	730	21	2	1.27	-0.3	519	1.55	3.20	-1.65
28-03	MW-3	6.3	1,064	19	3	0.44	-87.2	752	1.74	4.31	-2.57
28-03	MW-8	5.6	8,944	21	144	0.61	2.5	4,710	2.90	3.16	-0.26
28-03	MW-9	5.8	253	21	61	0.43	80.5	271	4.99	7.10	-2.11
28-03	MW-10	5.9	924	21	6	0.43	18.0	650	2.87	6.04	-3.17
28-03	MW-11	5.9	721	21	6	0.36	13.1	647	3.56	5.81	-2.25
28-03	MW-12	4.8	152	20	2	0.54	295.5	141	2.80	4.84	-2.04
28-03	MW-13	6.4	990	20	4	--	--	645	2.96	4.24	-1.28
28-03	MW-14	6.4	614	20	32	--	--	595	2.96	4.40	-1.44
28-03	MW-15	5.8	252	21	123	--	--	250	3.17	4.73	-1.56
28-03	MW-16	6.1	9,502	20	5	--	--	600	5.56	5.66	-0.10
28-03	MW-17	5.7	430	20	9	--	--	453	2.85	5.24	-2.39
Surface Water Sampling Locations											
28-03	SW-1	7.5	1,741	22	11	5	--	918			
28-03	SW-2	7.2	1,738	22	8	3	--	980			
28-03	SW-3	7.2	1,734	22	25	2	--	989			

Notes:
1. mg/L - milligrams per liter
2. µS/cm - Microsiemens per centimeter
3. TDS - Total Dissolved Solids
4. AMSL - Above Mean Sea Level
5. TOC - Top of Casing
6. S.U. - Standard Unit
7. mV - Millivolts
8. NTUs - Nephelometric Turbidity Units
9. -- Not measured

Table 2a
Detected Groundwater Constituents - Metals, Volatile Organic Compounds, and Inorganics
September 2013 Semi-Annual Sampling Event
Dare County C&D Landfill

			Metals																		Volatile Organic Compounds						Inorganics		
Facility Permit Number	Monitoring Well Code	Sample Date	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Copper	Iron	Lead	Manganese	Mercury	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc	Acetone	Benzene	Carbon Disulfide	Chlorobenzene	Chloromethane	Toluene	Alkalinity	Chloride	Sulfate
North Carolina 2L or Groundwater Protection Standard			1*	10	700	4*	2	10	1*	1,000	300	15	50	1	100	20	20	0.28*	0.3*	1,000	6,000	1	700	50	3	600	NS	250	250
Solid Waste Section Limit			6	10	100	1	1	10	10	10	300	10	50	0.2	50	10	10	5.5	25	10	100	1	100	3	1	1	NE	NE	250
28-03	MW-1	22-Aug-11		2.7J	48.1J	0.10J		1.6J	0.57J	2.5J	46,050	0.60J	552		2.5J	7.3J			3J	3.9J							239	1,070	58.8J
28-03	MW-1	16-Feb-12		2.2J	42.2J	0.09J		1.6J	0.39J	1.9J	49,400	0.47J	578		2J	6.7J			2.3J	1.8J							296	1,000	45.2J
28-03	MW-1	14-Aug-12		1.5J	42.9J	0.13J		0.85J	0.20J	1.9J	46,550		473		2J	5.5J			1J	15							273	906	64.5J
28-03	MW-1	28-Feb-13	0.15J	3.3J	76.9J	0.71J		3.4J	0.81J	3J	99,700	1.5J	526		3.2J	7.5J			6J	6.6J							254	975	61.5J
28-03	MW-1	30-Sep-13	0.11J	2.4J	34.1J	0.06J			0.16J	1.7J	20,540	0.03J	341	0.04J	2.2J	7.1J			3J	2J							276	950	27.3J
28-03	MW-2	22-Aug-11		0.21J	7.8J				0.14J	0.72J	16,160	0.06J	282		1.2J	0.26J			1.4J	2J							388	39	
28-03	MW-2	16-Feb-12		0.32J	12.9J	0.06J		0.94J	0.18J	1.5J	45,400	0.43J	344		0.88J	0.26J			1.9J	2.8J							393	37	
28-03	MW-2	14-Aug-12			8.7J		0.05J		0.12J	1.0J	23,480		262		1.2J				0.39J	11							378	38	10.9J
28-03	MW-2	28-Feb-13	0.31J	0.59J	45.8J	0.20J	0.14J	1.4J	0.15J	10	204,100	3.1J	399		1.5J	0.51J			3.9J	46							353	46	12.6J
28-03	MW-2	30-Sep-13	0.05J	0.22J	8.3J	0.03J			0.13J	0.40J	21,150	0.03J	219	0.04J	1.4J	0.53J			3.3J	1.8J							404	43	16.4J
28-03	MW-3	22-Aug-11		0.18J	13.0J	0.11J	0.04J		0.18J	0.72J	25,400	0.08J	355		1.2J				1.1J	3.6J							391	35	12.1J
28-03	MW-3	16-Feb-12			10.7J	0.11J	0.04J	0.22J	0.15J	0.28J	25,275	0.07J	398		0.77J				0.71J								408	34	
28-03	MW-3	14-Aug-12			13.8J	0.10J	0.04J	0.28J	0.16J	0.64J	25,325		244		1.6J				0.13J	6.9J							416	38	18.2J
28-03	MW-3	28-Feb-13	0.04J	0.48J	31.1J	0.32J	0.09J	1.0J	0.20J	0.24J	81,850	0.12J	553		1.9J	0.67J			1.5J	2.1J							473	56	108J
28-03	MW-3	30-Sep-13	0.04J	0.49J	15.4J	0.11J			0.15J	0.40J	30,090		373	0.04J	1.7J	0.63J			3.1J	1.6J							478	50	56.4J
28-03	MW-8	22-Aug-11		4.2J	253	0.74J		4.5J	0.12J	7.7J	31,125	0.11J	101		1.3J			0.05J	8.4J	3.1J							128	2,724	213J
28-03	MW-8	16-Feb-12		3.3J	237	0.5J		3.6J	0.24J	6.0J	24,150	0.16J	166		1.8J	14			5.4J	2.7J							179	2,699	166J
28-03	MW-8	14-Aug-12	0.04J	4.1J	192	0.96J		5.4J	0.15J	5.1J	35,150	0.17J	95		1.6J	16			11.1J	5.2J							157	2,693	191J
28-03	MW-8	28-Feb-13		9J	197	0.47J		3.6J	0.28J	8.0J	20,950		130		1.8J				6.3J	2.4J							177	3,049	191J
28-03	MW-8	30-Sep-13	0.05J	5.2J	215	0.32J		2.8J	0.15J	4.9J	41,480	0.04J	72	0.04J	1.6J	19			4.1J	3.6J							173	2,724	171J
28-03	MW-9	22-Aug-11		21	35.8J	0.18J	0.16J	6.1J	5.6J	2.8J	194,750	2.6J	162		7.1J	1.0J		0.12J	9.4J	47							38	12	194J
28-03	MW-9	16-Feb-12	0.21J	249	47.4J	0.45J	0.18J	14	3.2J	5.1J	68,075	8.1J	69		3.6J	1.5J	0.07J	0.08J	31	21							11	16	120J
28-03	MW-9	14-Aug-12	0.12J	36	25.3J	0.26J	0.20J	6.4J	3.6J	3.3J	9,725	3.5J	37J	0.02J	4.1J	0.72J		0.21J	11.5J	22							21	16	74.6J
28-03	MW-9	28-Feb-13		22	27.3J	0.18J	0.08J	7.6J	1.9J	3.3J	14,470	5.2J	27J		3.3J	0.91J		0.10J	13.9J	10							76	7	35.8J
28-03	MW-9	30-Sep-13	0.12J	28	21.8J	0.18J	0.17J	4.2J	1.9J	2.9J	24,650	2.2J	27J	0.03J	3.5J	1.4J		0.07J	11.9J	11							57	12	62.1J
28-03	MW-10	22-Aug-11	0.26J	5.8J	63.1J	0.22J	0.11J	3.9J	0.51J	1.3J	116,250	1.0J	567		2.3J	1.1J		0.05J	7.5J	5.3J							209	34	626
28-03	MW-10	16-Feb-12		10	42.5J	0.25J	0.12J	3.2J	2J	1.4J	68,475	1.3J	617		6.7J	1.1J		0.07J	8.5J	14							45	39	3,365
28-03	MW-10	14-Aug-12	0.10J	11	43.5J	0.10J	0.10J	1.2J	0.79J	1.7J	8,875	1.4J	440		4.2J	0.55J	0.37J		5.7J	6.4J							250	7	584
28-03	MW-10	28-Feb-13		16	20.8J	0.13J	0.05J	1.8J	0.43J	2.5J	36,300	5.7J	111		2.4J	0.52J			20.6J	2.9J							196	8	93.5J
28-03	MW-10	30-Sep-13	0.05J	6.4J	42.7J	0.08J	0.07J	0.81J	0.38J	0.77J	19,340	0.15J	193	0.05J	2.9J	0.90J			7.3J	3.6J							224	10	297

Table 2a
Detected Groundwater Constituents - Metals, Volatile Organic Compounds, and Inorganics
September 2013 Semi-Annual Sampling Event
Dare County C&D Landfill

			Metals																		Volatile Organic Compounds						Inorganics		
Facility Permit Number	Monitoring Well Code	Sample Date	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Copper	Iron	Lead	Manganese	Mercury	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc	Acetone	Benzene	Carbon Disulfide	Chlorobenzene	Chloromethane	Toluene	Alkalinity	Chloride	Sulfate
North Carolina 2L or Groundwater Protection Standard			1*	10	700	4*	2	10	1*	1,000	300	15	50	1	100	20	20	0.28*	0.3*	1,000	6,000	1	700	50	3	600	NS	250	250
Solid Waste Section Limit			6	10	100	1	1	10	10	10	300	10	50	0.2	50	10	10	5.5	25	10	100	1	100	3	1	1	NE	NE	250
28-03	MW-11	22-Aug-11		1.7J	50.1J	0.07J	0.10J	2.1J	0.74J	1.3J	18,880	1.4J	257		1.5J	0.41J		0.08J	3.6J	5.6J							93	47	257
28-03	MW-11	16-Feb-12		5.1J	72.4J	0.13J	0.16J	2.2J	2.7J	1.5J	54,125	1.6J	295		3.6J	0.35J		0.04J	4.7J	9J							48	60	376
28-03	MW-11	14-Aug-12	0.06J	5.8J	35.6J	0.11J	0.16J	1.8J	1.3J	1.6J	10,965	1.2J	100		3.0J	0.43J			3.8J	7.3J							83	23	192J
28-03	MW-11	28-Feb-13		2.6J	38.5J	0.11J	0.09J	1.4J	1.0J	1.1J	18,210	0.57J	96		3.0J	0.63J			3.4J	3.4J							141	33	297
28-03	MW-11	30-Sep-13	0.07J	2.6J	39.9J	0.05J	0.07J	0.46J	0.45J	1.6J	8,090	0.30J	93	0.05J	2.6J	0.65J			4.8J	6.2J							123	20	259
28-03	MW-12	22-Aug-11		5.5J	59.8J	0.10J	0.07J	1.2J	0.54J	0.85J	26,700	0.74J	579		2.3J	0.34J		0.03J	3.7J	6.5J							209	51	
28-03	MW-12	16-Feb-12		3.3J	43.6J	0.1J	0.04J	1.4J	0.93J	0.94J	11,685	1.3J	253		2.2J	0.24J		0.08J	3.6J	4.1J							49	38	14.6J
28-03	MW-12	14-Aug-12		2.9J	45.4J	0.10J	0.09J	0.97J	0.89J	1.1J	25,825	0.53J	367		3.1J	0.24J			2.0J	8.2J							100	27	19.7J
28-03	MW-12	28-Feb-13	0.19J	5.5J	38.6J	0.29J	0.10J	3.4J	0.82J	2.9J	13,830	4.2J	48J	0.02J	2.8J	0.32J			11.7J	8.3J							4	10	22.7J
28-03	MW-12	30-Sep-13	0.05J	1.1J	40.8J	0.11J	0.08J		0.46J	1.3J	474	0.31J	22J	0.04J	1.6J	0.40J		0.04J	3.3J	4.5J							2	25	14.3J
28-03	MW-13	18-Oct-11		2.7J	30.0J	0.10J	0.11J	2.5J	0.59J	0.78J	21,100	0.51J	2,672		1.3J	0.59J		0.03J	2.8J	4.9J							296	43	7.9J
28-03	MW-13	16-Feb-12	0.25J	3.8J	31.4J	0.08J	0.08J	1.4J	0.26J	0.27J	40,875	0.31J	351	0.11J	0.93J	0.34J		0.03J	2.5J	1.6J							343	46	12.9J
28-03	MW-13	14-Aug-12		3.4J	28.8J		0.08J	1.2J	0.14J	0.61J	33,860		211		0.85J	0.38J			1.6J	7.7J							253	46	20.0J
28-03	MW-13	28-Feb-13	0.29J	32	122	1	0.40J	20	5.8J	6.3J	200,400	16	379	0.05J	11.7J	1.2J		0.32J	46	140							209	57	52.8J
28-03	MW-13	30-Sep-13	0.24J	2.6J	40.7J	0.08J		0.91J	0.17J	0.54J	76,050	0.11J	329	0.05J	1.1J	1J	0.04J	0.06J	1.9J	1.3J							193	80	218J
28-03	MW-14	18-Oct-11		33	76.8J	0.54J	0.26J	6.2J	0.40J	0.57J	74,700	0.63J	188		1.0J	0.50J			12.0J	3.5J							243	38	
28-03	MW-14	16-Feb-12		3.3J	29.3J		0.04J	1.9J	0.2J	0.7J	32,250	0.18J	206		0.88J				1.8J	1.9J							273	36	
28-03	MW-14	14-Aug-12		3.6J	42.3J		0.09J	1.4J	0.15J	0.64J	50,075		220		0.94J	0.26J			1.3J	23							226	39	96.4J
28-03	MW-14	28-Feb-13	0.22J	74	218	2	0.52J	26	6.0J	7.1J	449,500	23	315	0.08J	12.4J	1.2J	0.12J	0.43J	53	129							153	53	175J
28-03	MW-14	30-Sep-13	0.14J	10	66.1J	0.10J	0.05J	3.2J	0.33J	0.71J	96,150	0.53J	186	0.04J	1.1J	0.62J		0.04J	3.4J	3.7J							228	27	253
28-03	MW-15	18-Oct-11		13	43.0J	0.26J	0.23J	3.5J	1.3J	1.6J	43,025	2.1J	292		2.7J	0.28J		0.05J	4.7J	354							191	29	30.2J
28-03	MW-15	16-Feb-12		5.3J	24.9J	0.07J	0.09J	0.9J	0.33J	0.3J	29,125	0.38J	226		0.62J				1.2J	78							143	30	23.4J
28-03	MW-15	14-Aug-12		11	28.3J	0.11J	0.13J	0.27J	0.12J	0.80J	32,000	0.12J	99		0.86J			0.07J	0.22J	72							92	28	28.3J
28-03	MW-15	28-Feb-13	0.16J	65	223	2	0.58J	28	6.8J	8.0J	281,600	30	354	0.08J	14.2J	1.5J	0.13J	0.39J	63	59							177	47	179J
28-03	MW-15	30-Sep-13	0.08J	13	50.1J	0.13J		0.52J	0.27J	0.57J	38,000	0.11J	110	0.03J	0.92J	0.35J		0.03J	1.1J	98							78	37	26.6J
28-03	MW-16	18-Oct-11	0.15J	3.7J	278	0.48J		3.9J	0.38J	7.6J	29,425	0.22J	89		2.1J				5.5J	3.7J							154	3,099	207J
28-03	MW-16	16-Feb-12		6.6J	283	0.36J		3.2J	0.17J	6.1J	24,175	0.06J	108		1.8J	21			4.7J	1J							163	2,824	255
28-03	MW-16	14-Aug-12	0.12J	8J	472	0.38J		3.1J	0.26J	8.2J	27,313	0.16J	81		2.2J	30		0.07J	4.2J	6.2J							133	3,539	177J
28-03	MW-16	28-Feb-13	0.16J	12	308	0.26J		2.9J	0.37J	9.2J	46,050		307		3.6J	31			3.6J	2.7J							304	2,799	178J
28-03	MW-16	30-Sep-13	0.10J	6.2J	366	0.44J		3.4J	0.21J	7.7J	45,800	0.09J	145	0.03J	1.8J	24		0.03J	4.6J	3.6J							154	3,374	267

Table 2a
Detected Groundwater Constituents - Metals, Volatile Organic Compounds, and Inorganics
September 2013 Semi-Annual Sampling Event
Dare County C&D Landfill

			Metals																		Volatile Organic Compounds						Inorganics		
Facility Permit Number	Monitoring Well Code	Sample Date	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Copper	Iron	Lead	Manganese	Mercury	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc	Acetone	Benzene	Carbon Disulfide	Chlorobenzene	Chloromethane	Toluene	Alkalinity	Chloride	Sulfate
North Carolina 2L or Groundwater Protection Standard			1*	10	700	4*	2	10	1*	1,000	300	15	50	1	100	20	20	0.28*	0.3*	1,000	6,000	1	700	50	3	600	NS	250	250
Solid Waste Section Limit			6	10	100	1	1	10	10	10	300	10	50	0.2	50	10	10	5.5	25	10	100	1	100	3	1	1	NE	NE	250
28-03	MW-17	18-Oct-11		**30**	63.5J	1	0.33J	2.9J	**3.7J**	1.4J	**47,875**	1.8J	**194**		7.9J	0.91J		0.03J	**8.3J**	957								19	**287**
28-03	MW-17	16-Feb-12		4.1J	36.8J	0.9J	0.21J	1.8J	**3.1J**	1.1J	**7,748**	1.4J	**98**		6.3J	0.51J			**2.1J**	382								22	**372**
28-03	MW-17	14-Aug-12		**11**	43.5J	0.80J	0.19J	2.5J	**2.9J**	1.1J	**30,800**	1.5J	**89**		7.8J	0.69J			**6.1J**	201							4	23	225J
28-03	MW-17	28-Feb-13	0.04J	1.3J	31.1J	0.36J	0.10J	1.1J	**3.8J**	1.6J	**8,480**	1.1J	**53**		5.9J	0.60J		0.08J	**1.9J**	103							1	15	140J
28-03	MW-17	30-Sep-13	0.09J	6J	17.3J	0.11J	0.05J	1.6J	0.31J	1.2J	**28,450**	0.31J	**93**	0.05J	2.3J	1.3J		0.03J	**3.6J**	33							61	17	121J

Notes:

1. Metal and volatile organic compound units are in micrograms per liter (parts per billion).
2. Inorganic units are in milligrams per liter (parts per million).
3. *-Groundwater Protection Standard
4. NE = Not Established
5. NS = No Standard
6. J - Indicates the analytical result is an estimated concentration between the method detection limit and the Solid Waste Section Reporting Limit.

- Blank cell indicates analyte was not detected
- Concentration exceeds N.C. 2L or Groundwater Protection Standard

Table 2b
Detected Surface Water Constituents - Metals, Volatile Organic Compounds, and Inorganics
September 2013 Semi-Annual Sampling Event
Dare County C&D Landfill

			Metals																		Volatile Organic Compounds						Inorganics		
Facility Permit Number	Surface Water Code	Sample Date	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Copper	Iron	Lead	Manganese	Mercury	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc	Acetone	Benzene	Chlorobenzene	Chloromethane	1,4-Dichlorobenzene	Toluene	Alkalinity	Chloride	Sulfate
North Carolina 2B, Action Level, or Human Health Standard			640*	10*	2,000*	6.5	2	50	4*	7**	1,000**	25	NS	0.012	88	5	0.06**	0.47*	NS	50**	2,000	51*	140	96*	100	11	NS	230**	NS
Solid Waste Section Limit			10	10	100	1	1	10	10	10	300	10	50	0.2	50	10	10	5.5	25	10	100	1	3	1	1	1	1	NE	250
28-03	SW-1	22-Aug-11		2.8J	23.7J			0.17J	0.54J	1.4J	274J	0.19J	635		2.5J	2.0J			2.9J	2.4J							214	**392**	76.3J
28-03	SW-1	16-Feb-12		2.1J	93J			0.19J	1.0J	2.1J	403	0.17J	201		3.9J	**7.2J**			0.72J	0.92J							158	**935**	170J
28-03	SW-1	14-Aug-12		2.3J	65.1J				0.64J	2.2J	651	0.38J	225		3.4J	**5.9J**			0.59J	4.7J							143	**717**	158J
28-03	SW-1	28-Feb-13	1.7J	1.8J	13.5J			0.85J	0.28J	1.7J	**4,220**	**35**	14J		0.82J	0.82J			2.2J	4.8J							5	145	
28-03	SW-1	30-Sep-13	0.09J	2.5J	31.8J	0.09J		0.77J	0.31J	1.7J	832	0.31J	201	**0.03J**	2.8J	3.1J			2.8J	2J							224	**304**	30.2J
28-03	SW-2	18-Oct-11	0.21J	3.5J	53.3J			0.70J	0.74J	3.3J	**2,396**	13	153		2.7J	**7.4J**			0.94J	9.4J							91	**1,170**	127J
28-03	SW-2	16-Feb-12		2.9J	97.3J			0.95J	1.4J	2.9J	**2,968**	4.9J	274		4.4J	**6.5J**			1.2J	7.6J							143	**935**	165J
28-03	SW-2	14-Aug-12	0.14J	3.0J	56.0J			0.93J	0.62J	2.0J	**2,389**	4.3J	116		3.0J	4.2J			0.80J	5.4J							128	**549**	150J
28-03	SW-2	28-Feb-13	0.49J	2.3J	35.4J	0.11J		2.0J	1.1J	3.2J	**5,155**	7.8J	169		3.1J	2.6J			3.2J	15							96	**276**	53.5J
28-03	SW-2	30-Sep-13	0.08J	2.1J	33.8J	0.07J		0.70J	0.28J	1.9J	**1,358**	0.73J	94	**0.03J**	2.6J	3.3J			1.8J	2.1J							203	**372**	22.3J
28-03	SW-3	22-Aug-11		4.5J	44.1J			0.53J	0.93J	3.3J	**1,142**	2.8J	106		3.2J	**6.3J**			3.2J	5.2J							178	**965**	117J
28-03	SW-3	16-Feb-12		2.7J	94.4J			0.64J	0.9J	2.2J	924	2.1J	249		3.8J	**8.1J**			0.72J	2.9J							159	**910**	153J
28-03	SW-3	14-Aug-12	0.17J	2.9J	55.4J			0.86J	0.60J	1.9J	**2,274**	3.6J	117		2.9J	4.6J			0.60J	4.8J							116	**567**	144J
28-03	SW-3	28-Feb-13	0.48J	2.2J	36.4J	0.12J	0.04J	2.5J	1.0J	4.1J	**5,650**	8.4J	162		3.1J	2.2J			4.0J	10							99	**270**	43.0J
28-03	SW-3	30-Sep-13	0.10J	4.3J	48.7J	0.16J		1.8J	0.97J	3.2J	**9,640**	6.8J	398	**0.04J**	3.4J	3.2J			4.9J	11							202	**342**	22.1J

Notes:

1. Metal and volatile organic compound concentrations are in micrograms per liter (parts per billion).
2. Inorganic concentrations are in milligrams per liter (parts per million).
3. Standards obtained from section 15A NCAC 02B .0211 Fresh Surface Water Quality Standards for Class C Waters.
4. * - Human Health Standard
5. ** - Action Level Standard
6. NS = No Standard NE = Not Established
7. J - Indicates the analytical result is an estimated concentration between the method detection limit and the Solid Waste Section Reporting Limit.

- Blank cell indicates the analyte was not detected
- Concentration exceeds the North Carolina 2B, Action Level, or Human Health Standard for Class C Waters

CDM Smith

0 250 500 1,000 Feet

Figure 1: Potentiometric Surface Map

November 2013 Semi-Annual Sampling Event
Construction & Demolition Debris Landfill
Dare County, North Carolina

Appendix A

Environment 1, Incorporated

Drinking Water ID: 37715
Wastewater ID: 10

P.O. BOX 7085, 114 OAKMONT DRIVE
GREENVILLE, N.C. 27835-7085

PHONE (252) 756-6208
FAX (252) 756-0633

ID#: 6051

DARE COUNTY (C&D SITE)
MR. EDWARD L. MANN
DARE CO. PUBLIC WORKS
P.O. BOX 1000
MANTEO ,NC 27954

DATE COLLECTED: 09/30/13
DATE REPORTED : 10/31/13

REVIEWED BY:

PARAMETERS	MDL	SWSL	MW-1	MW-2	MW-3	Duplicate MW-8	MW-8	Analysis Date	Analyst	Method Code
PH (field measurement), Units			6.8	6.8	6.3		5.6	09/30/13	BF	4500HB-00
Total Alkalinity (to pH 4.5), mg/l	1.0	1.0	276	404	478		173	10/01/13	TRB	2320B-97
Chloride, mg/l	5.0	5.0	950	43	50		2724	10/01/13	HMB	4500CLB-97
Total Dissolved Residue, mg/l	1.0	1.0	1120	519	752		4710	10/02/13	DRF	2540C-97
Sulfate, mg/l	5.0	250.0	27.3 J	16.4 J	56.4 J		171 J	10/04/13	TRB	4500SO42E97
Antimony, ug/l	0.02	6.0	0.11 J	0.05 J	0.04 J		0.05 J	10/15/13	MEL	EPA200.8
Antimony, ug/l	0.02	6.0				0.05 J		10/17/13	LFJ	EPA200.8
Arsenic, ug/l	0.05	10.0	2.4 J	0.22 J	0.49 J		5.2 J	10/15/13	MEL	EPA200.8
Arsenic, ug/l	0.05	10.0				6.3 J		10/17/13	LFJ	EPA200.8
Barium, ug/l	0.06	100.0	34.1 J	8.3 J	15.4 J			10/15/13	MEL	EPA200.8
Barium, ug/l	0.06	100.0				198		10/17/13	LFJ	EPA200.8
Barium, ug/l	0.06	100.0					215	10/31/13	LFJ	EPA200.8
Beryllium, ug/l	0.03	1.0	0.06 J	0.03 J	0.11 J		0.32 J	10/31/13	LFJ	EPA200.8
Beryllium, ug/l	0.03	1.0				0.32 J		10/17/13	LFJ	EPA200.8
Cadmium, ug/l	0.05	1.0	--- U	--- U	--- U		--- U	10/15/13	MEL	EPA200.8
Cadmium, ug/l	0.05	1.0				--- U		10/17/13	LFJ	EPA200.8
Cobalt, ug/l	0.02	10.0	0.16 J	0.13 J	0.15 J		0.15 J	10/15/13	MEL	EPA200.8
Cobalt, ug/l	0.02	10.0				0.14 J		10/17/13	LFJ	EPA200.8
Copper, ug/l	0.06	10.0	1.7 J	0.40 J	0.40 J		4.9 J	10/15/13	MEL	EPA200.8
Copper, ug/l	0.06	10.0				7.0 J		10/17/13	LFJ	EPA200.8
Total Chromium, ug/l	0.04	10.0	--- U	--- U	--- U		2.8 J	10/15/13	MEL	EPA200.8
Total Chromium, ug/l	0.04	10.0				4.0 J		10/17/13	LFJ	EPA200.8
Iron, ug/l	13.6	300.0	20540	21150	30090		41480	10/23/13	ADD	3111B-99
Iron, ug/l	13.6	300.0				36050		10/31/13	ADD	3111B-99
Manganese, ug/l	0.21	50.0	341	219	373		72	10/15/13	MEL	EPA200.8
Manganese, ug/l	0.21	50.0				126		10/23/13	LFJ	EPA200.7
Lead, ug/l	0.02	10.0	0.03 J	0.03 J	--- U		0.04 J	10/15/13	MEL	EPA200.8
Lead, ug/l	0.02	10.0				0.05 J		10/17/13	LFJ	EPA200.8
Mercury, ug/l	0.01	0.20	0.04 J	0.04 J	0.04 J	0.04 J	0.04 J	10/17/13	ADD	245.1 R3-94
Nickel, ug/l	0.45	50.0	2.2 J	1.4 J	1.7 J		1.6 J	10/15/13	MEL	EPA200.8
Nickel, ug/l	0.45	50.0				1.5 J		10/17/13	LFJ	EPA200.8
Selenium, ug/l	0.06	10.0	7.1 J	0.53 J	0.63 J		19	10/12/13	MEL	EPA200.8
Selenium, ug/l	0.06	10.0				24		10/17/13	LFJ	EPA200.8
Silver, ug/l	0.03	10.0	--- U	--- U	--- U		--- U	10/15/13	MEL	EPA200.8
Silver, ug/l	0.03	10.0				0.03 J		10/17/13	LFJ	EPA200.8
Thallium, ug/l	0.02	5.5	--- U	--- U	--- U		--- U	10/15/13	MEL	EPA200.8
Thallium, ug/l	0.02	5.5				0.12 J		10/17/13	LFJ	EPA200.8
Vanadium, ug/l	0.07	25.0	3.0 J	3.3 J	3.1 J		4.1 J	10/15/13	MEL	EPA200.8
Vanadium, ug/l	0.07	25.0				2.5 J		10/17/13	LFJ	EPA200.8
Zinc, ug/l	0.47	10.0	2.0 J	1.8 J	1.6 J		3.6 J	10/15/13	MEL	EPA200.8
Zinc, ug/l	0.47	10.0				2.6 J		10/17/13	LFJ	EPA200.8
Conductivity (at 25c), uMhos/cm	1.0	1.0	3608	730	1064		8944	09/30/13	BF	2510B-97

J = Between MDL and SWSL, U = Below ALL Quantitation Limits.

Environment 1, Incorporated

Drinking Water ID: 37715
Wastewater ID: 10

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DARE COUNTY (C&D SITE)
MR. EDWARD L. MANN
DARE CO. PUBLIC WORKS
P.O. BOX 1000
MANTEO ,NC 27954

DATE COLLECTED: 09/30/13
DATE REPORTED : 10/31/13

REVIEWED BY:

PARAMETERS	MDL	SWSL	MW-1	MW-2	MW-3	Duplicate MW-8	MW-8	Analysis Date	Analyst	Method Code
Dissolved Oxygen, mg/l	0.1	0.1	1.04	1.27	0.44		0.61	09/30/13	BF	4500OG-01
Temperature, °C			20	21	19		21	09/30/13	BF	2550B-00
Static Water Level, feet			2.33	3.20	4.31		3.16	09/30/13	BF	
Well Depth, feet			20.35	20.97	19.95		19.17	09/30/13	BF	
ORP, mv			-75.3	-0.3	-87.2		+2.5	09/30/13	BF	2580B
Turbidity (Field), NTU	1.0	1.0	22.2	2.24	3.22		144	09/30/13	BF	2130B-01

J = Between MDL and SWSL, U = Below ALL Quantitation Limits.

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Wastewater ID: 10

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DARE COUNTY (C&D SITE)
MR. EDWARD L. MANN
DARE CO. PUBLIC WORKS
P.O. BOX 1000
MANTEO ,NC 27954

DATE COLLECTED: 09/30/13
DATE REPORTED : 10/31/13

REVIEWED BY:

PARAMETERS	MDL	SWSL	MW-9	MW-10	MW-11	MW-12	Equipment Blank	Analysis Date	Analyst	Method Code
PH (field measurement), Units			5.8	5.9	5.9	4.8		09/30/13	BF	4500HB-00
Total Alkalinity (to pH 4.5), mg/l	1.0	1.0	57	224	123	2		10/01/13	TRB	2320B-97
Chloride, mg/l	5.0	5.0	12					10/01/13	HMB	4500CLB-97
Chloride, mg/l	5.0	5.0		10	20	25		10/04/13	HMB	4500CLB-97
Total Dissolved Residue, mg/l	1.0	1.0	271	650	647	141		10/02/13	DRF	2540C-97
Sulfate, mg/l	5.0	250.0	62.1 J	297	259	14.3 J		10/04/13	TRB	4500SO42E97
Antimony, ug/l	0.02	6.0	0.12 J	0.05 J	0.07 J	0.05 J		10/15/13	MEL	EPA200.8
Antimony, ug/l	0.02	6.0					0.22 J	10/17/13	LFJ	EPA200.8
Arsenic, ug/l	0.05	10.0	28	6.4 J	2.6 J	1.1 J		10/15/13	MEL	EPA200.8
Arsenic, ug/l	0.05	10.0					0.35 J	10/17/13	LFJ	EPA200.8
Barium, ug/l	0.06	100.0	21.8 J	42.7 J	39.9 J	40.8 J		10/15/13	MEL	EPA200.8
Barium, ug/l	0.06	100.0					0.32 J	10/17/13	LFJ	EPA200.8
Beryllium, ug/l	0.03	1.0	0.18 J	0.08 J	0.05 J	0.11 J		10/31/13	LFJ	EPA200.8
Beryllium, ug/l	0.03	1.0					0.03 J	10/17/13	LFJ	EPA200.8
Cadmium, ug/l	0.05	1.0	0.17 J	0.07 J	0.07 J	0.08 J		10/15/13	MEL	EPA200.8
Cadmium, ug/l	0.05	1.0					0.06 J	10/17/13	LFJ	EPA200.8
Cobalt, ug/l	0.02	10.0	1.9 J	0.38 J	0.45 J	0.46 J		10/15/13	MEL	EPA200.8
Cobalt, ug/l	0.02	10.0					0.04 J	10/17/13	LFJ	EPA200.8
Copper, ug/l	0.06	10.0	2.9 J	0.77 J	1.6 J	1.3 J		10/15/13	MEL	EPA200.8
Copper, ug/l	0.06	10.0					0.72 J	10/17/13	LFJ	EPA200.8
Total Chromium, ug/l	0.04	10.0	4.2 J	0.81 J	0.46 J	--- U		10/15/13	MEL	EPA200.8
Total Chromium, ug/l	0.04	10.0					--- U	10/17/13	LFJ	EPA200.8
Iron, ug/l	13.6	300.0	24650	19340	8090	474		10/23/13	ADD	3111B-99
Iron, ug/l	13.6	300.0					92 J	10/31/13	ADD	3111B-99
Manganese, ug/l	0.21	50.0	27 J	193	93	22 J		10/15/13	MEL	EPA200.8
Manganese, ug/l	0.21	50.0					--- U	10/17/13	LFJ	EPA200.8
Lead, ug/l	0.02	10.0	2.2 J	0.15 J	0.30 J	0.31 J		10/15/13	MEL	EPA200.8
Lead, ug/l	0.02	10.0					0.10 J	10/17/13	LFJ	EPA200.8
Mercury, ug/l	0.01	0.20	0.03 J	0.05 J	0.05 J	0.04 J	0.03 J	10/17/13	ADD	245.1 R3-94
Nickel, ug/l	0.45	50.0	3.5 J	2.9 J	2.6 J	1.6 J		10/15/13	MEL	EPA200.8
Nickel, ug/l	0.45	50.0					--- U	10/17/13	LFJ	EPA200.8
Selenium, ug/l	0.06	10.0	1.4 J	0.90 J	0.65 J	0.40 J		10/12/13	MEL	EPA200.8
Selenium, ug/l	0.06	10.0					0.20 J	10/17/13	LFJ	EPA200.8
Silver, ug/l	0.03	10.0	--- U	--- U	--- U	--- U		10/15/13	MEL	EPA200.8
Silver, ug/l	0.03	10.0					0.04 J	10/17/13	LFJ	EPA200.8
Thallium, ug/l	0.02	5.5	0.07 J	--- U	--- U	0.04 J		10/15/13	MEL	EPA200.8
Thallium, ug/l	0.02	5.5					0.31 J	10/17/13	LFJ	EPA200.8
Vanadium, ug/l	0.07	25.0	11.9 J	7.3 J	4.8 J	3.3 J		10/15/13	MEL	EPA200.8
Vanadium, ug/l	0.07	25.0					0.34 J	10/17/13	LFJ	EPA200.8
Zinc, ug/l	0.47	10.0	11	3.6 J	6.2 J	4.5 J		10/15/13	MEL	EPA200.8
Zinc, ug/l	0.47	10.0					2.5 J	10/17/13	LFJ	EPA200.8
Conductivity (at 25c), uMhos/cm	1.0	1.0	253	924	721	152		09/30/13	BF	2510B-97

J = Between MDL and SWSL, U = Below ALL Quantitation Limits.

Environment 1, Incorporated

Drinking Water ID: 37715
Wastewater ID: 10

P.O. BOX 7085, 114 OAKMONT DRIVE
GREENVILLE, N.C. 27835-7085

PHONE (252) 756-6208
FAX (252) 756-0633

ID#: 6051

DARE COUNTY (C&D SITE)
MR. EDWARD L. MANN
DARE CO. PUBLIC WORKS
P.O. BOX 1000
MANTEO ,NC 27954

DATE COLLECTED: 09/30/13
DATE REPORTED : 10/31/13

REVIEWED BY:

PARAMETERS	MDL	SWSL	MW-9	MW-10	MW-11	MW-12	Equipment Blank	Analysis Date	Analyst	Method Code
Dissolved Oxygen, mg/l	0.1	0.1	0.43	0.43	0.36	0.54		09/30/13	BF	4500OG-01
Temperature, °C			21	21	21	20		09/30/13	BF	2550B-00
Static Water Level, feet			7.10	6.04	5.81	4.84		09/30/13	BF	
Well Depth, feet			22.75	21.97	20.42	22.65		09/30/13	BF	
ORP, mv			+80.5	+18.0	+13.1	+295.5		09/30/13	BF	2580B
Turbidity (Field), NTU	1.0	1.0	60.9	6.31	6.08	2.17		09/30/13	BF	2130B-01

J = Between MDL and SWSL, U = Below ALL Quantitation Limits.

Environment 1, Incorporated

Drinking Water ID: 37715
Wastewater ID: 10

P.O. BOX 7085, 114 OAKMONT DRIVE
GREENVILLE, N.C. 27835-7085

PHONE (252) 756-6208
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CLIENT: DARE COUNTY (C&D SITE)
MR. EDWARD L. MANN
DARE CO. PUBLIC WORKS
P.O. BOX 1000
MANTEO, NC 27954

REVIEWED BY:

CLIENT ID: 6051

ANALYST: MAO
DATE COLLECTED: 09/30/13
DATE ANALYZED: 10/12/13
DATE REPORTED: 10/31/13

VOLATILE ORGANICS
EPA METHOD 8260B R1(96)

PARAMETERS, ug/l	MDL	SWSL	MW-1	MW-2	MW-3	Duplicate MW-8	MW-8
1. Chloromethane	0.77	1.0	--- U	--- U	--- U	--- U	--- U
2. Vinyl Chloride	0.63	1.0	--- U	--- U	--- U	--- U	--- U
3. Bromomethane	0.67	10.0	--- U	--- U	--- U	--- U	--- U
4. Chloroethane	0.48	10.0	--- U	--- U	--- U	--- U	--- U
5. Trichlorofluoromethane	0.24	1.0	--- U	--- U	--- U	--- U	--- U
6. 1,1-Dichloroethene	0.17	5.0	--- U	--- U	--- U	--- U	--- U
7. Acetone	9.06	100.0	--- U	--- U	--- U	--- U	--- U
8. Iodomethane	0.26	10.0	--- U	--- U	--- U	--- U	--- U
9. Carbon Disulfide	0.23	100.0	--- U	--- U	--- U	--- U	--- U
10. Methylene Chloride	0.64	1.0	--- U	--- U	--- U	--- U	--- U
11. trans-1,2-Dichloroethene	0.23	5.0	--- U	--- U	--- U	--- U	--- U
12. 1,1-Dichloroethane	0.20	5.0	--- U	--- U	--- U	--- U	--- U
13. Vinyl Acetate	0.20	50.0	--- U	--- U	--- U	--- U	--- U
14. Cis-1,2-Dichloroethene	0.25	5.0	--- U	--- U	--- U	--- U	--- U
15. 2-Butanone	2.21	100.0	--- U	--- U	--- U	--- U	--- U
16. Bromochloromethane	0.27	3.0	--- U	--- U	--- U	--- U	--- U
17. Chloroform	0.25	5.0	--- U	--- U	--- U	--- U	--- U
18. 1,1,1-Trichloroethane	0.19	1.0	--- U	--- U	--- U	--- U	--- U
19. Carbon Tetrachloride	0.22	1.0	--- U	--- U	--- U	--- U	--- U
20. Benzene	0.24	1.0	--- U	--- U	--- U	--- U	--- U
21. 1,2-Dichloroethane	0.27	1.0	--- U	--- U	--- U	--- U	--- U
22. Trichloroethene	0.23	1.0	--- U	--- U	--- U	--- U	--- U
23. 1,2-Dichloropropane	0.21	1.0	--- U	--- U	--- U	--- U	--- U
24. Bromodichloromethane	0.21	1.0	--- U	--- U	--- U	--- U	--- U
25. Cis-1,3-Dichloropropene	0.24	1.0	--- U	--- U	--- U	--- U	--- U
26. 4-Methyl-2-Pentanone	1.19	100.0	--- U	--- U	--- U	--- U	--- U
27. Toluene	0.23	1.0	--- U	--- U	--- U	--- U	--- U
28. trans-1,3-Dichloropropene	0.28	1.0	--- U	--- U	--- U	--- U	--- U
29. 1,1,2-Trichloroethane	0.25	1.0	--- U	--- U	--- U	--- U	--- U
30. Tetrachloroethene	0.17	1.0	--- U	--- U	--- U	--- U	--- U
31. 2-Hexanone	1.57	50.0	--- U	--- U	--- U	--- U	--- U
32. Dibromochloromethane	0.24	3.0	--- U	--- U	--- U	--- U	--- U
33. 1,2-Dibromoethane	0.26	1.0	--- U	--- U	--- U	--- U	--- U
34. Chlorobenzene	0.30	3.0	--- U	--- U	--- U	--- U	--- U
35. 1,1,1,2-Tetrachloroethane	0.22	5.0	--- U	--- U	--- U	--- U	--- U
36. Ethylbenzene	0.21	1.0	--- U	--- U	--- U	--- U	--- U
37. Xylenes	0.68	5.0	--- U	--- U	--- U	--- U	--- U
38. Dibromomethane	0.28	10.0	--- U	--- U	--- U	--- U	--- U
39. Styrene	0.19	1.0	--- U	--- U	--- U	--- U	--- U
40. Bromoform	0.20	3.0	--- U	--- U	--- U	--- U	--- U
41. 1,1,2,2-Tetrachloroethane	0.26	3.0	--- U	--- U	--- U	--- U	--- U
42. 1,2,3-Trichloropropane	0.43	1.0	--- U	--- U	--- U	--- U	--- U
43. 1,4-Dichlorobenzene	0.39	1.0	--- U	--- U	--- U	--- U	--- U
44. 1,2-Dichlorobenzene	0.32	5.0	--- U	--- U	--- U	--- U	--- U
45. 1,2-Dibromo-3-Chloropropane	0.34	13.0	--- U	--- U	--- U	--- U	--- U
46. Acrylonitrile	2.72	200.0	--- U	--- U	--- U	--- U	--- U
47. trans-1,4-Dichloro-2-Butene	0.42	100.0	--- U	--- U	--- U	--- U	--- U
48. Tetrahydrofuran	0.39	1.0	--- U	--- U	--- U	--- U	--- U

J = Between MDL and SWSL, U = Below ALL Quantitation Limits.

NOTE: EPA METHOD 8260B R1 (96): Duplicate MW-8 and MW-8 received at pH > 2.

Environment 1, Incorporated

Drinking Water ID: 37715
Wastewater ID: 10

P.O. BOX 7085, 114 OAKMONT DRIVE
GREENVILLE, N.C. 27835-7085

PHONE (252) 756-6208
FAX (252) 756-0633

CLIENT: DARE COUNTY (C&D SITE)
MR. EDWARD L. MANN
DARE CO. PUBLIC WORKS
P.O. BOX 1000
MANTEO, NC 27954

REVIEWED BY:

CLIENT ID: 6051

ANALYST: MAO
DATE COLLECTED: 09/30/13
DATE ANALYZED: 10/12/13
DATE REPORTED: 10/31/13

VOLATILE ORGANICS
EPA METHOD 8260B R1(96)

PARAMETERS, ug/l	MDL	SWSL	MW-9	MW-10	MW-11	MW-12	Equipment Blank
1. Chloromethane	0.77	1.0	--- U	--- U	--- U	--- U	--- U
2. Vinyl Chloride	0.63	1.0	--- U	--- U	--- U	--- U	--- U
3. Bromomethane	0.67	10.0	--- U	--- U	--- U	--- U	--- U
4. Chloroethane	0.48	10.0	--- U	--- U	--- U	--- U	--- U
5. Trichlorofluoromethane	0.24	1.0	--- U	--- U	--- U	--- U	--- U
6. 1,1-Dichloroethene	0.17	5.0	--- U	--- U	--- U	--- U	--- U
7. Acetone	9.06	100.0	--- U	--- U	--- U	--- U	--- U
8. Iodomethane	0.26	10.0	--- U	--- U	--- U	--- U	--- U
9. Carbon Disulfide	0.23	100.0	--- U	--- U	--- U	--- U	--- U
10. Methylene Chloride	0.64	1.0	--- U	--- U	--- U	--- U	--- U
11. trans-1,2-Dichloroethene	0.23	5.0	--- U	--- U	--- U	--- U	--- U
12. 1,1-Dichloroethane	0.20	5.0	--- U	--- U	--- U	--- U	--- U
13. Vinyl Acetate	0.20	50.0	--- U	--- U	--- U	--- U	--- U
14. Cis-1,2-Dichloroethene	0.25	5.0	--- U	--- U	--- U	--- U	--- U
15. 2-Butanone	2.21	100.0	--- U	--- U	--- U	--- U	--- U
16. Bromochloromethane	0.27	3.0	--- U	--- U	--- U	--- U	--- U
17. Chloroform	0.25	5.0	--- U	--- U	--- U	--- U	--- U
18. 1,1,1-Trichloroethane	0.19	1.0	--- U	--- U	--- U	--- U	--- U
19. Carbon Tetrachloride	0.22	1.0	--- U	--- U	--- U	--- U	--- U
20. Benzene	0.24	1.0	--- U	--- U	--- U	--- U	--- U
21. 1,2-Dichloroethane	0.27	1.0	--- U	--- U	--- U	--- U	--- U
22. Trichloroethene	0.23	1.0	--- U	--- U	--- U	--- U	--- U
23. 1,2-Dichloropropane	0.21	1.0	--- U	--- U	--- U	--- U	--- U
24. Bromodichloromethane	0.21	1.0	--- U	--- U	--- U	--- U	--- U
25. Cis-1,3-Dichloropropene	0.24	1.0	--- U	--- U	--- U	--- U	--- U
26. 4-Methyl-2-Pentanone	1.19	100.0	--- U	--- U	--- U	--- U	--- U
27. Toluene	0.23	1.0	--- U	--- U	--- U	--- U	--- U
28. trans-1,3-Dichloropropene	0.28	1.0	--- U	--- U	--- U	--- U	--- U
29. 1,1,2-Trichloroethane	0.25	1.0	--- U	--- U	--- U	--- U	--- U
30. Tetrachloroethene	0.17	1.0	--- U	--- U	--- U	--- U	--- U
31. 2-Hexanone	1.57	50.0	--- U	--- U	--- U	--- U	--- U
32. Dibromochloromethane	0.24	3.0	--- U	--- U	--- U	--- U	--- U
33. 1,2-Dibromoethane	0.26	1.0	--- U	--- U	--- U	--- U	--- U
34. Chlorobenzene	0.30	3.0	--- U	--- U	--- U	--- U	--- U
35. 1,1,1,2-Tetrachloroethane	0.22	5.0	--- U	--- U	--- U	--- U	--- U
36. Ethylbenzene	0.21	1.0	--- U	--- U	--- U	--- U	--- U
37. Xylenes	0.68	5.0	--- U	--- U	--- U	--- U	--- U
38. Dibromomethane	0.28	10.0	--- U	--- U	--- U	--- U	--- U
39. Styrene	0.19	1.0	--- U	--- U	--- U	--- U	--- U
40. Bromoform	0.20	3.0	--- U	--- U	--- U	--- U	--- U
41. 1,1,2,2-Tetrachloroethane	0.26	3.0	--- U	--- U	--- U	--- U	--- U
42. 1,2,3-Trichloropropane	0.43	1.0	--- U	--- U	--- U	--- U	--- U
43. 1,4-Dichlorobenzene	0.39	1.0	--- U	--- U	--- U	--- U	--- U
44. 1,2-Dichlorobenzene	0.32	5.0	--- U	--- U	--- U	--- U	--- U
45. 1,2-Dibromo-3-Chloropropane	0.34	13.0	--- U	--- U	--- U	--- U	--- U
46. Acrylonitrile	2.72	200.0	--- U	--- U	--- U	--- U	--- U
47. trans-1,4-Dichloro-2-Butene	0.42	100.0	--- U	--- U	--- U	--- U	--- U
48. Tetrahydrofuran	0.39	1.0	--- U	--- U	--- U	--- U	--- U

J = Between MDL and SWSL, U = Below ALL Quantitation Limits.

Environment 1, Incorporated

Drinking Water ID: 37715
Wastewater ID: 10

P.O. BOX 7085, 114 OAKMONT DRIVE
GREENVILLE, N.C. 27835-7085

PHONE (252) 756-6208
FAX (252) 756-0633

CLIENT: DARE COUNTY (C&D SITE)
MR. EDWARD L. MANN
DARE CO. PUBLIC WORKS
P.O. BOX 1000
MANTEO, NC 27954

CLIENT ID: 6051

ANALYST: MAO
DATE COLLECTED: 09/30/13
DATE ANALYZED: 10/12/13
DATE REPORTED: 10/31/13

REVIEWED BY: _____

VOLATILE ORGANICS
EPA METHOD 8260B R1(96)

PARAMETERS, ug/l	MDL	SWSL	Trip Blank
1. Chloromethane	0.77	1.0	--- U
2. Vinyl Chloride	0.63	1.0	--- U
3. Bromomethane	0.67	10.0	--- U
4. Chloroethane	0.48	10.0	--- U
5. Trichlorofluoromethane	0.24	1.0	--- U
6. 1,1-Dichloroethene	0.17	5.0	--- U
7. Acetone	9.06	100.0	--- U
8. Iodomethane	0.26	10.0	--- U
9. Carbon Disulfide	0.23	100.0	--- U
10. Methylene Chloride	0.64	1.0	--- U
11. trans-1,2-Dichloroethene	0.23	5.0	--- U
12. 1,1-Dichloroethane	0.20	5.0	--- U
13. Vinyl Acetate	0.20	50.0	--- U
14. Cis-1,2-Dichloroethene	0.25	5.0	--- U
15. 2-Butanone	2.21	100.0	--- U
16. Bromochloromethane	0.27	3.0	--- U
17. Chloroform	0.25	5.0	--- U
18. 1,1,1-Trichloroethane	0.19	1.0	--- U
19. Carbon Tetrachloride	0.22	1.0	--- U
20. Benzene	0.24	1.0	--- U
21. 1,2-Dichloroethane	0.27	1.0	--- U
22. Trichloroethene	0.23	1.0	--- U
23. 1,2-Dichloropropane	0.21	1.0	--- U
24. Bromodichloromethane	0.21	1.0	--- U
25. Cis-1,3-Dichloropropene	0.24	1.0	--- U
26. 4-Methyl-2-Pentanone	1.19	100.0	--- U
27. Toluene	0.23	1.0	--- U
28. trans-1,3-Dichloropropene	0.28	1.0	--- U
29. 1,1,2-Trichloroethane	0.25	1.0	--- U
30. Tetrachloroethene	0.17	1.0	--- U
31. 2-Hexanone	1.57	50.0	--- U
32. Dibromochloromethane	0.24	3.0	--- U
33. 1,2-Dibromoethane	0.26	1.0	--- U
34. Chlorobenzene	0.30	3.0	--- U
35. 1,1,1,2-Tetrachloroethane	0.22	5.0	--- U
36. Ethylbenzene	0.21	1.0	--- U
37. Xylenes	0.68	5.0	--- U
38. Dibromomethane	0.28	10.0	--- U
39. Styrene	0.19	1.0	--- U
40. Bromoform	0.20	3.0	--- U
41. 1,1,2,2-Tetrachloroethane	0.26	3.0	--- U
42. 1,2,3-Trichloropropane	0.43	1.0	--- U
43. 1,4-Dichlorobenzene	0.39	1.0	--- U
44. 1,2-Dichlorobenzene	0.32	5.0	--- U
45. 1,2-Dibromo-3-Chloropropane	0.34	13.0	--- U
46. Acrylonitrile	2.72	200.0	--- U
47. trans-1,4-Dichloro-2-Butene	0.42	100.0	--- U
48. Tetrahydrofuran	0.39	1.0	--- U

J = Between MDL and SWSL, U = Below ALL Quantitation Limits.

Environment 1, Inc.
P.O. Box 7085, 114 Oakmont Dr.
Greenville, NC 27858

Phone (252) 756-6208 • Fax (252) 756-0633

CHAIN OF CUSTODY RECORD

CLIENT: 6051 **Week: 35**

DARE COUNTY (C&D SITE)
MR. EDWARD L. MANN
DARE CO. PUBLIC WORKS
P.O. BOX 1000
MANTEO NC 27954

DISINFECTION: ☐ CHLORINE ☐ UV ☐ NONE ☐ _____

SAMPLE LOCATION	COLLECTION DATE	COLLECTION TIME	TOTAL CHLORINE, mg/l OR ug/l AT COLLECTION	TEMPERATURE, °C AT COLLECTION	# OF CONTAINERS	Field pH	Alkalinity	Chloride	TDS	Sulfate	Metals	Conductivity	DO	Temperature	Field Parameter	EPA 8260B	8260 Dup. 1	8260 Dup. 2	ORP	Field Parmeter
											2									
CONTAINER TYPE, P/G						P	P	P	P	P	P	P	P	P		G	G	G	P	P
CHEMICAL PRESERVATION						A	A	A	A	A	A	A	A	A		E	E	E	A	A
MW-1	9-30-13	1140		20	8	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
MW-2	9-30-13	1140		21	7	G	G	G	G	G	G	G	G	G	G	G	G		G	G
MW-3	9-30-13	1200		19	7	G	G	G	G	G	G	G	G	G	G	G	G		G	G
Duplicate MW-8	9-30-13	1045		21	3						G					G	G			
MW-8	9-30-13	1045		21	7	G	G	G	G	G	G	G	G	G	G	G	G		G	G
MW-9	9-30-13	1420		21	7	G	G	G	G	G	G	G	G	G	G	G			G	G
MW-10	9-30-13	1315		21	7	G	G	G	G	G	G	G	G	G	G	G	G		G	G
MW-11	9-30-13	1250		21	7	G	G	G	G	G	G	G	G	G	G	G	G		G	G
MW-12	9-30-13	1230		20	7	G	G	G	G	G	G	G	G	G	G	G	G		G	G
Equipment Blank	9-30-13	0900			3						G					G	G			
Trip Blank	9-30-13				2											G	G			

CHLORINE NEUTRALIZED AT COLLECTION
pH CHECK (LAB)
CONTAINER TYPE, P/G
CHEMICAL PRESERVATION

PARAMETERS

A - NONE D - NAOH
B - HNO_3 E - HCL
C - H_2SO_4 F - ZINC ACETATE/NAOH
G - NA THIOSULFATE

CLASSIFICATION:
☐ WASTEWATER (NPDES)
☐ DRINKING WATER
☐ DWQ/GW
☒ SOLID WASTE SECTION

CHAIN OF CUSTODY MAINTAINED DURING SHIPMENT/DELIVERY: (Y) N

SAMPLES COLLECTED BY: (Please Print) Bobby Tom

SAMPLES RECEIVED IN LAB AT 0.8 °C

RELINQUISHED BY (SIG.) (SAMPLER)	DATE/TIME	RECEIVED BY (SIG.)	DATE/TIME
Bobby Tom	9-30-13 1650	[signature]	9/30/13 1452
RELINQUISHED BY (SIG.)	DATE/TIME	RECEIVED BY (SIG.)	DATE/TIME
RELINQUISHED BY (SIG.)	DATE/TIME	RECEIVED BY (SIG.)	DATE/TIME

COMMENTS:

PLEASE READ Instructions for completing this form on the reverse side.

Sampler must place a "C" for composite sample or a "G" for Grab sample in the blocks above for each parameter requested.

FORM #5

№ 262631

Environment 1, Incorporated

Drinking Water ID: 37715
Wastewater ID: 10

P.O. BOX 7085, 114 OAKMONT DRIVE
GREENVILLE, N.C. 27835-7085

PHONE (252) 756-6208
FAX (252) 756-0633

ID#: 6051 A

DARE COUNTY (C&D SITE)
MR. EDWARD L. MANN
DARE CO. PUBLIC WORKS
P.O. BOX 1000
MANTEO ,NC 27954

DATE COLLECTED: 09/30/13
DATE REPORTED : 10/31/13

REVIEWED BY:

PARAMETERS	MDL	SWSL	MW-13	MW-14	MW-15	MW-16	MW-17	Analysis Date	Analyst	Method Code
PH (field measurement), Units			6.4	6.4	5.8	6.1	5.7	09/30/13	BF	4500HB-00
Total Alkalinity (to pH 4.5), mg/l	1.0	1.0	193	228	78	154	61	10/01/13	TRB	2320B-97
Chloride, mg/l	5.0	5.0	80	27	37	3374	17	10/04/13	HMB	4500CLB-97
Total Dissolved Residue, mg/l	1.0	1.0	645	595	250	600	453	10/02/13	DRF	2540C-97
Sulfate, mg/l	5.0	250.0	218 J	253	26.6 J	267	121 J	10/04/13	TRB	4500SO42E97
Antimony, ug/l	0.02	6.0	0.24 J	0.14 J	0.08 J	0.10 J	0.09 J	10/17/13	LFJ	EPA200.8
Arsenic, ug/l	0.05	10.0	2.6 J	10	13	6.2 J	6.0 J	10/17/13	LFJ	EPA200.8
Barium, ug/l	0.06	100.0	40.7 J	66.1 J	50.1 J	366	17.3 J	10/17/13	LFJ	EPA200.8
Beryllium, ug/l	0.03	1.0	0.08 J	0.10 J	0.13 J	0.44 J	0.11 J	10/17/13	LFJ	EPA200.8
Cadmium, ug/l	0.05	1.0	--- U	0.05 J	--- U	--- U	0.05 J	10/17/13	LFJ	EPA200.8
Cobalt, ug/l	0.02	10.0	0.17 J	0.33 J	0.27 J	0.21 J	0.31 J	10/17/13	LFJ	EPA200.8
Copper, ug/l	0.06	10.0	0.54 J	0.71 J	0.57 J	7.7 J	1.2 J	10/17/13	LFJ	EPA200.8
Total Chromium, ug/l	0.04	10.0	0.91 J	3.2 J	0.52 J	3.4 J	1.6 J	10/17/13	LFJ	EPA200.8
Iron, ug/l	13.6	300.0	76050	96150	38000	45800	28450	10/31/13	ADD	3111B-99
Manganese, ug/l	0.42	50.0	329	186	110	145	93	10/23/13	LFJ	EPA200.7
Lead, ug/l	0.02	10.0	0.11 J	0.53 J	0.11 J	0.09 J	0.31 J	10/17/13	LFJ	EPA200.8
Mercury, ug/l	0.01	0.20	0.05 J	0.04 J	0.03 J	0.03 J	0.05 J	10/17/13	ADD	245.1 R3-94
Nickel, ug/l	0.45	50.0	1.1 J	1.1 J	0.92 J	1.8 J	2.3 J	10/17/13	LFJ	EPA200.8
Selenium, ug/l	0.06	10.0	1.0 J	0.62 J	0.35 J	24	1.3 J	10/17/13	LFJ	EPA200.8
Silver, ug/l	0.03	10.0	0.04 J	--- U	--- U	--- U	--- U	10/17/13	LFJ	EPA200.8
Thallium, ug/l	0.02	5.5	0.06 J	0.04 J	0.03 J	0.03 J	0.03 J	10/17/13	LFJ	EPA200.8
Vanadium, ug/l	0.07	25.0	1.9 J	3.4 J	1.1 J	4.6 J	3.6 J	10/17/13	LFJ	EPA200.8
Zinc, ug/l	0.47	10.0	1.3 J	3.7 J	98	3.6 J	33	10/17/13	LFJ	EPA200.8
Conductivity (at 25c), uMhos/cm	1.0	1.0	990	614	252	9502	430	09/30/13	BF	2510B-97
Temperature, °C			20	20	21	20	20	09/30/13	BF	2550B-00
Static Water Level, feet			4.24	4.40	4.73	5.66	5.24	09/30/13	BF	
Well Depth, feet			22.41	22.02	22.62	20.11	14.78	09/30/13	BF	
Turbidity (Field), NTU	1.0	1.0	3.81	31.9	123	4.78	8.93	09/30/13	BF	2130B-01

J = Between MDL and SWSL, U = Below ALL Quantitation Limits.

Environment 1, Incorporated

Drinking Water ID: 37715
Wastewater ID: 10

P.O. BOX 7085, 114 OAKMONT DRIVE
GREENVILLE, N.C. 27835-7085

PHONE (252) 756-6208
FAX (252) 756-0633

ID#: 6051 A

DARE COUNTY (C&D SITE)
MR. EDWARD L. MANN
DARE CO. PUBLIC WORKS
P.O. BOX 1000
MANTEO ,NC 27954

DATE COLLECTED: 09/30/13
DATE REPORTED : 10/31/13

REVIEWED BY:

PARAMETERS	MDL	SWSL	SW-1	SW-2	SW-3	Analysis Date	Analyst	Method Code
PH (field measurement), Units			7.5	7.2	7.2	09/30/13	BF	4500HB-00
Total Alkalinity (to pH 4.5), mg/l	1.0	1.0	224	203	202	10/01/13	TRB	2320B-97
Chloride, mg/l	5.0	5.0	304	372	342	10/04/13	HMB	4500CLB-97
Total Dissolved Residue, mg/l	1.0	1.0	918	980	989	10/02/13	DRF	2540C-97
Sulfate, mg/l	5.0	250.0	30.2 J	22.3 J	22.1 J	10/04/13	TRB	4500SO42E97
Antimony, ug/l	0.02	6.0	0.09 J	0.08 J	0.10 J	10/17/13	LFJ	EPA200.8
Arsenic, ug/l	0.05	10.0	2.5 J	2.1 J	4.3 J	10/17/13	LFJ	EPA200.8
Barium, ug/l	0.06	100.0	31.8 J	33.8 J	48.7 J	10/17/13	LFJ	EPA200.8
Beryllium, ug/l	0.03	1.0	0.09 J	0.07 J	0.16 J	10/17/13	LFJ	EPA200.8
Cadmium, ug/l	0.05	1.0	--- U	--- U	--- U	10/17/13	LFJ	EPA200.8
Cobalt, ug/l	0.02	10.0	0.31 J	0.28 J	0.97 J	10/17/13	LFJ	EPA200.8
Copper, ug/l	0.06	10.0	1.7 J	1.9 J	3.2 J	10/17/13	LFJ	EPA200.8
Total Chromium, ug/l	0.04	10.0	0.77 J	0.70 J	1.8 J	10/17/13	LFJ	EPA200.8
Iron, ug/l	13.6	300.0	832	1358	9640	10/31/13	ADD	3111B-99
Manganese, ug/l	0.42	50.0	201	94	398	10/23/13	LFJ	EPA200.7
Lead, ug/l	0.02	10.0	0.31 J	0.73 J	6.8 J	10/17/13	LFJ	EPA200.8
Mercury, ug/l	0.01	0.20	0.03 J	0.03 J	0.04 J	10/17/13	ADD	245.1 R3-94
Nickel, ug/l	0.45	50.0	2.8 J	2.6 J	3.4 J	10/17/13	LFJ	EPA200.8
Selenium, ug/l	0.06	10.0	3.1 J	3.3 J	3.2 J	10/17/13	LFJ	EPA200.8
Silver, ug/l	0.03	10.0	--- U	--- U	--- U	10/17/13	LFJ	EPA200.8
Thallium, ug/l	0.02	5.5	--- U	--- U	--- U	10/17/13	LFJ	EPA200.8
Vanadium, ug/l	0.07	25.0	2.8 J	1.8 J	4.9 J	10/17/13	LFJ	EPA200.8
Zinc, ug/l	0.47	10.0	2.0 J	2.1 J	11	10/17/13	LFJ	EPA200.8
Conductivity (at 25c), uMhos/cm	1.0	1.0	1741	1738	1734	09/30/13	BF	2510B-97
Dissolved Oxygen, mg/l	0.1	0.1	4.95	2.56	2.02	09/30/13	BF	4500OG-01
Temperature, °C			22	22	22	09/30/13	BF	2550B-00
Turbidity (Field), NTU	1.0	1.0	10.6	8.15	24.7	09/30/13	BF	2130B-01

J = Between MDL and SWSL, U = Below ALL Quantitation Limits.

Environment 1, Incorporated

Drinking Water ID: 37715
Wastewater ID: 10

P.O. BOX 7085, 114 OAKMONT DRIVE
GREENVILLE, N.C. 27835-7085

PHONE (252) 756-6208
FAX (252) 756-0633

CLIENT: DARE COUNTY (C&D SITE)
MR. EDWARD L. MANN
DARE CO. PUBLIC WORKS
P.O. BOX 1000
MANTEO, NC 27954

REVIEWED BY:

CLIENT ID: 6051 A

ANALYST: MAO
DATE COLLECTED: 09/30/13
DATE ANALYZED: 10/12/13
DATE REPORTED: 10/31/13

VOLATILE ORGANICS
EPA METHOD 8260B R1(96)

PARAMETERS, ug/l	MDL	SWSL	MW-13	MW-14	MW-15	MW-16	MW-17
1. Chloromethane	0.77	1.0	--- U	--- U	--- U	--- U	--- U
2. Vinyl Chloride	0.63	1.0	--- U	--- U	--- U	--- U	--- U
3. Bromomethane	0.67	10.0	--- U	--- U	--- U	--- U	--- U
4. Chloroethane	0.48	10.0	--- U	--- U	--- U	--- U	--- U
5. Trichlorofluoromethane	0.24	1.0	--- U	--- U	--- U	--- U	--- U
6. 1,1-Dichloroethene	0.17	5.0	--- U	--- U	--- U	--- U	--- U
7. Acetone	9.06	100.0	--- U	--- U	--- U	--- U	--- U
8. Iodomethane	0.26	10.0	--- U	--- U	--- U	--- U	--- U
9. Carbon Disulfide	0.23	100.0	--- U	--- U	--- U	--- U	--- U
10. Methylene Chloride	0.64	1.0	--- U	--- U	--- U	--- U	--- U
11. trans-1,2-Dichloroethene	0.23	5.0	--- U	--- U	--- U	--- U	--- U
12. 1,1-Dichloroethane	0.20	5.0	--- U	--- U	--- U	--- U	--- U
13. Vinyl Acetate	0.20	50.0	--- U	--- U	--- U	--- U	--- U
14. Cis-1,2-Dichloroethene	0.25	5.0	--- U	--- U	--- U	--- U	--- U
15. 2-Butanone	2.21	100.0	--- U	--- U	--- U	--- U	--- U
16. Bromochloromethane	0.27	3.0	--- U	--- U	--- U	--- U	--- U
17. Chloroform	0.25	5.0	--- U	--- U	--- U	--- U	--- U
18. 1,1,1-Trichloroethane	0.19	1.0	--- U	--- U	--- U	--- U	--- U
19. Carbon Tetrachloride	0.22	1.0	--- U	--- U	--- U	--- U	--- U
20. Benzene	0.24	1.0	--- U	--- U	--- U	--- U	--- U
21. 1,2-Dichloroethane	0.27	1.0	--- U	--- U	--- U	--- U	--- U
22. Trichloroethene	0.23	1.0	--- U	--- U	--- U	--- U	--- U
23. 1,2-Dichloropropane	0.21	1.0	--- U	--- U	--- U	--- U	--- U
24. Bromodichloromethane	0.21	1.0	--- U	--- U	--- U	--- U	--- U
25. Cis-1,3-Dichloropropene	0.24	1.0	--- U	--- U	--- U	--- U	--- U
26. 4-Methyl-2-Pentanone	1.19	100.0	--- U	--- U	--- U	--- U	--- U
27. Toluene	0.23	1.0	--- U	--- U	--- U	--- U	--- U
28. trans-1,3-Dichloropropene	0.28	1.0	--- U	--- U	--- U	--- U	--- U
29. 1,1,2-Trichloroethane	0.25	1.0	--- U	--- U	--- U	--- U	--- U
30. Tetrachloroethene	0.17	1.0	--- U	--- U	--- U	--- U	--- U
31. 2-Hexanone	1.57	50.0	--- U	--- U	--- U	--- U	--- U
32. Dibromochloromethane	0.24	3.0	--- U	--- U	--- U	--- U	--- U
33. 1,2-Dibromoethane	0.26	1.0	--- U	--- U	--- U	--- U	--- U
34. Chlorobenzene	0.30	3.0	--- U	--- U	--- U	--- U	--- U
35. 1,1,1,2-Tetrachloroethane	0.22	5.0	--- U	--- U	--- U	--- U	--- U
36. Ethylbenzene	0.21	1.0	--- U	--- U	--- U	--- U	--- U
37. Xylenes	0.68	5.0	--- U	--- U	--- U	--- U	--- U
38. Dibromomethane	0.28	10.0	--- U	--- U	--- U	--- U	--- U
39. Styrene	0.19	1.0	--- U	--- U	--- U	--- U	--- U
40. Bromoform	0.20	3.0	--- U	--- U	--- U	--- U	--- U
41. 1,1,2,2-Tetrachloroethane	0.26	3.0	--- U	--- U	--- U	--- U	--- U
42. 1,2,3-Trichloropropane	0.43	1.0	--- U	--- U	--- U	--- U	--- U
43. 1,4-Dichlorobenzene	0.39	1.0	--- U	--- U	--- U	--- U	--- U
44. 1,2-Dichlorobenzene	0.32	5.0	--- U	--- U	--- U	--- U	--- U
45. 1,2-Dibromo-3-Chloropropane	0.34	13.0	--- U	--- U	--- U	--- U	--- U
46. Acrylonitrile	2.72	200.0	--- U	--- U	--- U	--- U	--- U
47. trans-1,4-Dichloro-2-Butene	0.42	100.0	--- U	--- U	--- U	--- U	--- U
48. Tetrahydrofuran	0.39	1.0	--- U	--- U	--- U	--- U	--- U

J = Between MDL and SWSL, U = Below ALL Quantitation Limits.

Environment 1, Incorporated

Drinking Water ID: 37715
Wastewater ID: 10

P.O. BOX 7085, 114 OAKMONT DRIVE
GREENVILLE, N.C. 27835-7085

PHONE (252) 756-6208
FAX (252) 756-0633

CLIENT: DARE COUNTY (C&D SITE)
MR. EDWARD L. MANN
DARE CO. PUBLIC WORKS
P.O. BOX 1000
MANTEO, NC 27954

REVIEWED BY:

CLIENT ID: 6051 A

ANALYST: MAO
DATE COLLECTED: 09/30/13
DATE ANALYZED: 10/12/13
DATE REPORTED: 10/31/13

VOLATILE ORGANICS
EPA METHOD 8260B R1(96)

PARAMETERS, ug/l	MDL	SWSL	SW-1	SW-2	SW-3
1. Chloromethane	0.77	1.0	--- U	--- U	--- U
2. Vinyl Chloride	0.63	1.0	--- U	--- U	--- U
3. Bromomethane	0.67	10.0	--- U	--- U	--- U
4. Chloroethane	0.48	10.0	--- U	--- U	--- U
5. Trichlorofluoromethane	0.24	1.0	--- U	--- U	--- U
6. 1,1-Dichloroethene	0.17	5.0	--- U	--- U	--- U
7. Acetone	9.06	100.0	--- U	--- U	--- U
8. Iodomethane	0.26	10.0	--- U	--- U	--- U
9. Carbon Disulfide	0.23	100.0	--- U	--- U	--- U
10. Methylene Chloride	0.64	1.0	--- U	--- U	--- U
11. trans-1,2-Dichloroethene	0.23	5.0	--- U	--- U	--- U
12. 1,1-Dichloroethane	0.20	5.0	--- U	--- U	--- U
13. Vinyl Acetate	0.20	50.0	--- U	--- U	--- U
14. Cis-1,2-Dichloroethene	0.25	5.0	--- U	--- U	--- U
15. 2-Butanone	2.21	100.0	--- U	--- U	--- U
16. Bromochloromethane	0.27	3.0	--- U	--- U	--- U
17. Chloroform	0.25	5.0	--- U	--- U	--- U
18. 1,1,1-Trichloroethane	0.19	1.0	--- U	--- U	--- U
19. Carbon Tetrachloride	0.22	1.0	--- U	--- U	--- U
20. Benzene	0.24	1.0	--- U	--- U	--- U
21. 1,2-Dichloroethane	0.27	1.0	--- U	--- U	--- U
22. Trichloroethene	0.23	1.0	--- U	--- U	--- U
23. 1,2-Dichloropropane	0.21	1.0	--- U	--- U	--- U
24. Bromodichloromethane	0.21	1.0	--- U	--- U	--- U
25. Cis-1,3-Dichloropropene	0.24	1.0	--- U	--- U	--- U
26. 4-Methyl-2-Pentanone	1.19	100.0	--- U	--- U	--- U
27. Toluene	0.23	1.0	--- U	--- U	--- U
28. trans-1,3-Dichloropropene	0.28	1.0	--- U	--- U	--- U
29. 1,1,2-Trichloroethane	0.25	1.0	--- U	--- U	--- U
30. Tetrachloroethene	0.17	1.0	--- U	--- U	--- U
31. 2-Hexanone	1.57	50.0	--- U	--- U	--- U
32. Dibromochloromethane	0.24	3.0	--- U	--- U	--- U
33. 1,2-Dibromoethane	0.26	1.0	--- U	--- U	--- U
34. Chlorobenzene	0.30	3.0	--- U	--- U	--- U
35. 1,1,1,2-Tetrachloroethane	0.22	5.0	--- U	--- U	--- U
36. Ethylbenzene	0.21	1.0	--- U	--- U	--- U
37. Xylenes	0.68	5.0	--- U	--- U	--- U
38. Dibromomethane	0.28	10.0	--- U	--- U	--- U
39. Styrene	0.19	1.0	--- U	--- U	--- U
40. Bromoform	0.20	3.0	--- U	--- U	--- U
41. 1,1,2,2-Tetrachloroethane	0.26	3.0	--- U	--- U	--- U
42. 1,2,3-Trichloropropane	0.43	1.0	--- U	--- U	--- U
43. 1,4-Dichlorobenzene	0.39	1.0	--- U	--- U	--- U
44. 1,2-Dichlorobenzene	0.32	5.0	--- U	--- U	--- U
45. 1,2-Dibromo-3-Chloropropane	0.34	13.0	--- U	--- U	--- U
46. Acrylonitrile	2.72	200.0	--- U	--- U	--- U
47. trans-1,4-Dichloro-2-Butene	0.42	100.0	--- U	--- U	--- U
48. Tetrahydrofuran	0.39	1.0	--- U	--- U	--- U

J = Between MDL and SWSL, U = Below ALL Quantitation Limits.

Environmental, Inc.
P.O. Box 7085, 114 Oakmont Dr.
Greenville, NC 27858

Phone (252) 756-6208 • Fax (252) 756-0633

CHAIN OF CUSTODY RECORD

CLIENT: 6051 A **Week: 35**

DARE COUNTY (C&D SITE)
MR. EDWARD L. MANN
DARE CO. PUBLIC WORKS
P.O. BOX 1000
MANTEO NC 27954

DISINFECTION
- [ ] CHLORINE
- [ ] UV
- [ ] NONE
- [ ] _____

SAMPLE LOCATION	COLLECTION DATE	COLLECTION TIME	TOTAL CHLORINE, mg/l OR ug/l AT COLLECTION	TEMPERATURE, °C AT COLLECTION	# OF CONTAINERS	Field pH	Alkalinity	Chloride	TDS	Sulfate	Metals	Conductivity	DO	Temperature	Field Parameter	EPA 8260B	8260 Dup. 1	8260 Dup. 2	Field Parmeter		
CHLORINE NEUTRALIZED AT COLLECTION																					
pH CHECK (LAB)											L2					L2	L2	L2			
CONTAINER TYPE, P/G						P	P	P	P	P	P	P	P	P		G	G	G	P		
CHEMICAL PRESERVATION						A	A	A	A	A	A	A	A	A		E	E	E	A		
PARAMETERS						G	G	G	G	G	G	G		G	G	G	G	G	G		
MW-13	9-30-13	0905		20	8	G	G	G	G	G	G	G		G	G	G	G	G	G		
MW-14	9-30-13	0930		20	7	G	G	G	G	G	G	G		G	G	G	G		G		
MW-15	9-30-13	0950		21	7	G	G	G	G	G	G	G		G	G	G	G		G		
MW-16	9-30-13	1015		20	7	G	G	G	G	G	G	G		G	G	G	G		G		
MW-17	9-30-13	1345		20	7	G	G	G	G	G	G	G		G	G	G	G		G		
SW-1	9-30-13	1430		22	7	G	G	G	G	G	G	G	G	G		G	G		G		
SW-2	9-30-13	1335		22	7	G	G	G	G	G	G	G	G	G		G	G		G		
SW-3	9-30-13	1410		22	7	G	G	G	G	G	G	G	G	G		G	G		G		

A - NONE D - NAOH
B - HNO_3 E - HCL
C - H_2SO_4 F - ZINC ACETATE/NAOH
G - NA THIOSULFATE

CLASSIFICATION:
- [ ] WASTEWATER (NPDES)
- [ ] DRINKING WATER
- [ ] DWQ/GW
- [X] SOLID WASTE SECTION

CHAIN OF CUSTODY MAINTAINED DURING SHIPMENT/DELIVERY: Y (circled) N

SAMPLES COLLECTED BY: (Please Print) Bobby / Tom

SAMPLES RECEIVED IN LAB AT 0.2 °C

RELINQUISHED BY (SIG.) (SAMPLER)	DATE/TIME	RECEIVED BY (SIG.)	DATE/TIME
Bobby Fox	9-30-13 1650	[signature]	9/30/13 452
RELINQUISHED BY (SIG.)	DATE/TIME	RECEIVED BY (SIG.)	DATE/TIME
RELINQUISHED BY (SIG.)	DATE/TIME	RECEIVED BY (SIG.)	DATE/TIME

COMMENTS:

PLEASE READ Instructions for completing this form on the reverse side.

Sampler must place a "C" for composite sample or a "G" for Grab sample in the blocks above for each parameter requested.

FORM #5

№ 262630

CDM Smith

cdmsmith.com