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

(August 2011 Sampling Event)

Dare County

Report

December 2011

CDM

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 - Camp Dresser & McKee

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@cdm.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	August 22 & October 18, 2011

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

Mathew F. Colone — 12/5/2011

Signature — Date

Affix NC Licensed/ Professional Geologist Seal

NORTH CAROLINA LICENSED SEAL 1851 GEOLOGIST MATHEW F. COLONE 12/5/2011

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

CDM

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

December 5, 2011

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

Subject: August 2011 Semi-Annual Monitoring Sampling Report
Dare County C&D Landfill
Facility Permit No. 28-03

Dear Ms. Drummond:

CDM, on behalf of Dare County, is submitting a copy of the August 2011 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 2011. The approved groundwater monitoring network consists of 13 wells (MW-1, -2, -3, -8, -9, -10, -11, -12, -13, -14, -15, -16, and -17) and 3 surface water sampling locations (SW-1, -2, and –3). Field activities and sampling results for all wells and surface water sampling locations are discussed below.

Field Activities

Groundwater and surface water samples from the Dare County C&D Landfill were collected on August 22 and October 18, 2011 by Environment One, Inc. Groundwater elevations were measured at each well prior to sampling and are presented in **Table 1**. These groundwater elevations were used to construct a potentiometric surface map for this sampling event. The potentiometric contours and sampling locations are presented on **Figure 1**. Prior to sampling each well was measured in the field for pH, conductivity, temperature, and total dissolved solids. The water quality parameters at the time of sampling are also presented in **Table 1**.

Sampling Results

Environment One, Inc. in Greenville, North Carolina analyzed groundwater samples for the North Carolina Appendix I volatile organic compounds (VOC's), metals, and select inorganics. 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 indicates the analytes detected above the MDL at each sampling location. No "J" flag detections are provided. Underlined analytes exceeded the North Carolina 2L Standard (2L), Groundwater Protection Standard, or the North Carolina Surface Water Standards for Class C Waters (2B). A complete summary of all detected and estimated concentrations for the August 2011 sampling events is provided in **Table 2**. Copies of the laboratory reports are provided in **Appendix A**. Please note that SW-1 and SW-3 are referred to as "Upstream" and "Downstream" in the laboratory report.

MW-1

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

MW-2

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

MW-3

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

MW-8

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

MW-9

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

MW-10

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

MW-11

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

MW-12

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

MW-13

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

MW-14

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

MW-15

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

MW-16

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

MW-17

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

SW-1

Inorganics:	Chloride
Metals:	Manganese
Volatile Organic Compounds:	None Detected

SW-2

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

SW-3

Inorganics:	Chloride
Metals:	Manganese
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, MW-15, MW-17
Selenium:	SW-2, SW-3
Vanadium:	MW-1, MW-2, MW-3, MW-8, MW-9, MW-10, MW-11, MW-12, MW-13, MW-14, MW-15, MW-16, MW-17

CDM will monitor future analytical results to determine if any trend appears and Dare County will continue with the semi-annual groundwater monitoring program.

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.
Camp Dresser & McKee

cc: Edward Mann, Dare County

Table 1
Water Quality Field Parameters
Augsut 2011 Semi-Annual Sampling Event
Dare County C&D Landfill

		Water Quality Parameters				Groundwater Elevations		
Facility Permit Number	***Monitoring Well I.D.***	***pH***	***Conductivity (uS/cm)***	***Temperature (deg.C)***	***TDS (mg/L)***	***TOC Elevation (feet AMSL)***	***Depth to Groundwater (feet)***	***Groundwater Elevation (feet AMSL)***
28-03	MW-1	6.40	2,090	20	2,140	1.61	3.54	-1.93
28-03	MW-2	6.60	725	20	553	1.55	4.61	-3.06
28-03	MW-3	6.60	703	21	516	1.74	5.33	-3.59
28-03	MW-8	6.10	5,073	21	4,530	2.90	3.35	-0.45
28-03	MW-9	5.00	430	23	435	4.99	8.26	-3.27
28-03	MW-10	5.60	1,142	22	1,280	2.87	6.4	-3.53
28-03	MW-11	5.70	740	21	589	3.56	6.27	-2.71
28-03	MW-12	6.30	534	20	391	2.80	5.65	-2.85
28-03	MW-13	6.60	659	19	453	2.96	3.92	-0.96
28-03	MW-14	6.00	524	19	298	2.96	4.02	-1.06
28-03	MW-15	7.00	540	19	323	3.17	4.71	-1.54
28-03	MW-16	6.10	6,560	21	5,080	5.56	5.31	0.25
28-03	MW-17	4.70	598	21	43	2.85	4.36	-1.51
Surface Water Sampling Locations								
28-03	SW-1	7.60	1,330	30	979			
28-03	SW-2	6.60	3,150	21	2,110			
28-03	SW-3	7.20	2,054	30	2,040			

Notes:
1. mg/L - milligrams per liter
2. *uS* - Microsiemens
3. TDS - Total Dissolved Solids
4. AMSL - Above Mean Sea Level
5. TOC - Top of Casing

Table 2a
Detected Groundwater Constituents - Metals, Volatile Organic Compounds, and Inorganics
August 2011 Semi-Annual Sampling Event
Dare County C&D Landfill

			Metals																		Volatile Organic Compounds						Inorganics		
Facility Permit Number	Monitor Well ID	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 (mg/L)	Chloride (mg/L)	Sulfate (mg/L)
North Carolina 2L Standard			**1***	**10**	**700**	**4***	**2**	**10**	**1***	**1,000**	**NS**	**15**	**NS**	**1**	**100**	**20**	**20**	**0.2***	**0.3***	**1,000**	**6,000**	**1**	**700**	**50**	**3**	**600**	**NS**	**NS**	**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**	**1**	**5**	**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			**3.0J**	3.9J							239	1,070	58.8J
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**	2.0J							388	39	
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-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-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-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-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-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-13	18-Oct-11		2.7J	30.0J	0.10J	0.11J	2.5J	0.59J	0.78J	21,100	0.51J	2672		1.3J	0.59J		0.03J	**2.8J**	4.9J							296	43	7.9J
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-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-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-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**

Notes:

Metal and Volatile Organic Compound units are in micrograms per liter (parts per billion).

Inorganic units are in milligrams per liter (parts per million).

*-Groundwater Protection Standard

NS = No Standard

- Concentration exceeds NC 2L Groundwater Standards

- Blank cells indicate analyte was not detected

J - Indicates the analytical result is an estimated concentration between the method detection limit and the Solid Waste Section Reporting Limit (SWSL)

Table 2b
Detected Surface Water Constituents - Metals, Volatile Organic Compounds, and Inorganics
August 2011 Semi-Annual Sampling Event
Dare County C&D Landfill

			Metals																	Volatile Organic Compounds						Inorganics		
Facility Permit Number	Location	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 (mg/L)	Chloride (mg/L)	Sulfate (mg/L)
North Carolina 2B Standard			10*	10*	1,000	6.5	2	50	NS	7**	1,000**	25	200	0.012	88	5	0.06**	NS	NS	50**	NS	51	488	NS	488	11	NS	230**	250
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	5	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-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-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

Notes:

Metal and Volatile Organic Compound units are in micrograms per liter (parts per billion).

Inorganic units are in milligrams per liter (parts per million).

Standards obtained from section 15A NCAC 02B .0211 Fresh Surface Water Quality Standards for Class C Waters

NS = No Standard

- Concentrations exceeds NC2B Standards for Class C Waters

- Blank cells indicate analyte was not detected

* - Human Health Standard

** - Action Level Standard

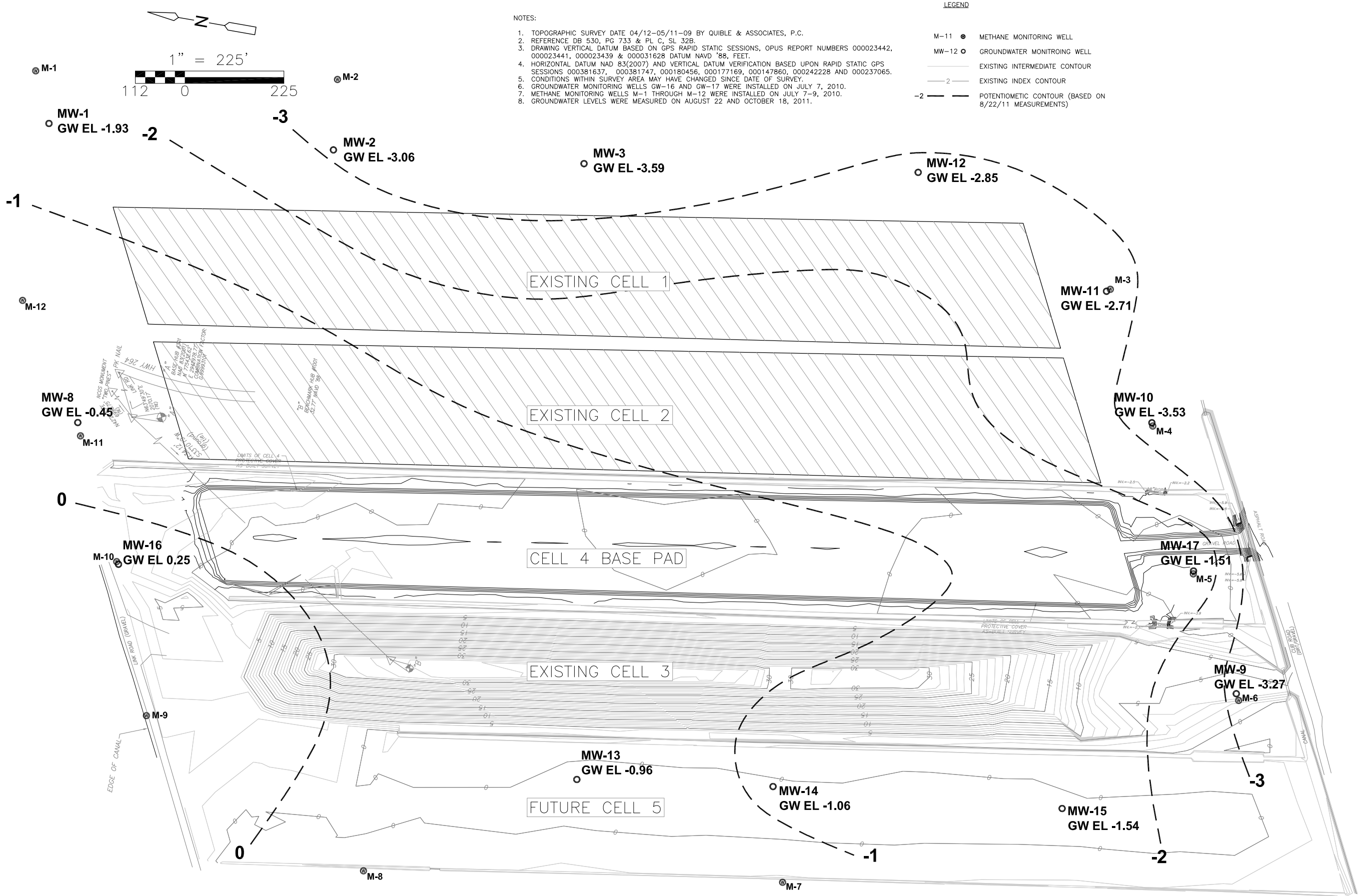
J - Indicates the analytical result is an estimated concentration between the Method Detection Limit and the Solid Waste Section Reporting Limit.

NOTES:

1. TOPOGRAPHIC SURVEY DATE 04/12–05/11–09 BY QUIBLE & ASSOCIATES, P.C.
2. REFERENCE DB 530, PG 733 & PL C, SL 32B.
3. DRAWING VERTICAL DATUM BASED ON GPS RAPID STATIC SESSIONS, OPUS REPORT NUMBERS 000023442, 000023441, 000023439 & 000031628 DATUM NAVD '88, FEET.
4. HORIZONTAL DATUM NAD 83(2007) AND VERTICAL DATUM VERIFICATION BASED UPON RAPID STATIC GPS SESSIONS 000381637, 000381747, 000180456, 000177169, 000147860, 000242228 AND 000237065.
5. CONDITIONS WITHIN SURVEY AREA MAY HAVE CHANGED SINCE DATE OF SURVEY.
6. GROUNDWATER MONITORING WELLS GW–16 AND GW–17 WERE INSTALLED ON JULY 7, 2010.
7. METHANE MONITORING WELLS M–1 THROUGH M–12 WERE INSTALLED ON JULY 7–9, 2010.
8. GROUNDWATER LEVELS WERE MEASURED ON AUGUST 22 AND OCTOBER 18, 2011.

LEGEND

M–11	METHANE MONITORING WELL
MW–12	GROUNDWATER MONITROING WELL
	EXISTING INTERMEDIATE CONTOUR
2	EXISTING INDEX CONTOUR
–2	POTENTIOMETIC CONTOUR (BASED ON 8/22/11 MEASUREMENTS)



REV. NO.	DATE	DRWN	CHKD	REMARKS

DESIGNED BY: P. STOUT
DRAWN BY: A. WEISPFENNING
SHEET CHK'D BY: M. COLONE
CROSS CHK'D BY:
APPROVED BY:
DATE: DECEMBER 2011

CDM
Camp Dresser & McKee
5400 Glenwood Avenue, Suite 300
Raleigh, NC 27612
Tel: (919) 787-5620 Fax: (919) 781-5730
North Carolina Firm Licensure: F-0412
consulting • engineering • construction • operations

DARE COUNTY
NORTH CAROLINA

CONSTRUCTION & DEMOLITION DEBRIS LANDFILL

POTENTIOMETRIC CONTOUR MAP

PROJECT NO. 17952 56960
FILE NAME: DARE C&D F11

SHEET NO.
1

12/05/11 3:09:42 PM C:\DOCUMENTS AND SETTINGS\WEISPFENNINGAM\DESKTOP\ALL FILES\AUTOCAD FILES\DARE C&D F11.DWG

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: 08/22/11
DATE REPORTED : 09/09/11

REVIEWED BY:

PARAMETERS	MDL	SWSL	Upstream	Downstream	MW-1	MW-2	MW-3	Analysis Date	Analyst	Method Code
PH (field measurement), Units			7.6	7.2	6.4	6.6	6.6	08/22/11	RJH	SM4500HB
Total Alkalinity, mg/l	1.0	1.0	214	178	239	388	391	08/23/11	TRB	SM2320B
Chloride, mg/l	5.0	5.0	392	965	1070	39	35	08/23/11	HLB	SM4500-CLB
Total Dissolved Residue, mg/l	1.0	1.0	979	2040	2140	553	516	08/24/11	MEL	SM2540C
Sulfate, mg/l	5.0	250.0	76.3 J	117 J	58.8 J	--- U	12.1 J	08/23/11	TRB	SM426C
Antimony, ug/l	0.14	6.0	--- U	--- U				08/31/11	CMF	EPA200.8
Antimony, ug/l	0.14	6.0			--- U	--- U	--- U	08/24/11	CMF	EPA200.8
Arsenic, ug/l	0.10	10.0	2.8 J	4.5 J				08/31/11	CMF	EPA200.8
Arsenic, ug/l	0.10	10.0			2.7 J	0.21 J	0.18 J	08/24/11	CMF	EPA200.8
Barium, ug/l	0.02	100.0	23.7 J	44.1 J				08/31/11	CMF	EPA200.8
Barium, ug/l	0.02	100.0			48.1 J	7.8 J	13.0 J	08/24/11	CMF	EPA200.8
Beryllium, ug/l	0.02	1.0	--- U	--- U				08/31/11	CMF	EPA200.8
Beryllium, ug/l	0.02	1.0			0.10 J	--- U	0.11 J	08/24/11	CMF	EPA200.8
Cadmium, ug/l	0.02	1.0	--- U	--- U				08/31/11	CMF	EPA200.8
Cadmium, ug/l	0.02	1.0			--- U	--- U	0.04 J	08/24/11	CMF	EPA200.8
Cobalt, ug/l	0.03	10.0	0.54 J	0.93 J				08/31/11	CMF	EPA200.8
Cobalt, ug/l	0.03	10.0			0.57 J	0.14 J	0.18 J	08/24/11	CMF	EPA200.8
Copper, ug/l	0.02	10.0	1.4 J	3.3 J				08/31/11	CMF	EPA200.8
Copper, ug/l	0.02	10.0			2.5 J	0.72 J	0.72 J	08/24/11	CMF	EPA200.8
Total Chromium, ug/l	0.04	10.0	0.17 J	0.53 J				08/31/11	CMF	EPA200.8
Total Chromium, ug/l	0.04	10.0			1.6 J	--- U	--- U	08/24/11	CMF	EPA200.8
Iron, ug/l	15.9	300.0	274 J	1142	46050	16160	25400	09/01/11	ADD	SM3111B
Manganese, ug/l	0.61	50.0	635	106				08/29/11	LFJ	EPA200.7
Manganese, ug/l	0.61	50.0			552	282	355	08/26/11	LFJ	EPA200.7
Lead, ug/l	0.02	10.0	0.19 J	2.8 J				08/31/11	CMF	EPA200.8
Lead, ug/l	0.02	10.0			0.60 J	0.06 J	0.08 J	08/24/11	CMF	EPA200.8
Mercury, ug/l	0.05	0.20	--- U	--- U				08/31/11	CMF	EPA200.8
Mercury, ug/l	0.05	0.20			--- U	--- U	--- U	08/24/11	CMF	EPA200.8
Nickel, ug/l	0.04	50.0	2.5 J	3.2 J				08/31/11	CMF	EPA200.8
Nickel, ug/l	0.04	50.0			2.5 J	1.2 J	1.2 J	08/24/11	CMF	EPA200.8
Selenium, ug/l	0.20	10.0	2.0 J	6.3 J				08/31/11	CMF	EPA200.8
Selenium, ug/l	0.20	10.0			7.3 J	0.26 J	--- U	08/24/11	CMF	EPA200.8
Silver, ug/l	0.02	10.0	--- U	--- U				08/31/11	CMF	EPA200.8
Silver, ug/l	0.02	10.0			--- U	--- U	--- U	08/24/11	CMF	EPA200.8
Thallium, ug/l	0.02	5.5	--- U	--- U				08/31/11	CMF	EPA200.8
Thallium, ug/l	0.02	5.5			--- U	--- U	--- U	08/24/11	CMF	EPA200.8
Vanadium, ug/l	0.14	25.0	2.9 J	3.2 J				08/31/11	CMF	EPA200.8
Vanadium, ug/l	0.14	25.0			3.0 J	1.4 J	1.1 J	08/24/11	CMF	EPA200.8
Zinc, ug/l	0.24	10.0	2.4 J	5.2 J				08/31/11	CMF	EPA200.8
Zinc, ug/l	0.24	10.0			3.9 J	2.0 J	3.6 J	08/24/11	CMF	EPA200.8
Conductivity (at 25c), uMhos	1.0	1.0	1330	2054	2090	725	703	08/22/11	RJH	SM2510B
Temperature, °C			30	30	20	20	21	08/22/11	RJH	SM2550B
Static Water Level, feet					3.54	4.61	5.33	08/22/11	RJH	
Well Depth, feet					20.35	20.97	19.95	08/22/11	RJH	

J = Between MDL and SWSL, U = Below ALL Quanititation 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: 08/22/11
DATE REPORTED : 09/09/11

REVIEWED BY:

PARAMETERS	MDL	SWSL	MW-8	MW-9	MW-10	MW-11	MW-12	Analysis Date	Analyst	Method Code
PH (field measurement), Units			6.1	5.0	5.6	5.7	6.3	08/22/11	RJH	SM4500HB
Total Alkalinity, mg/l	1.0	1.0	128	38	209	93	209	08/23/11	TRB	SM2320B
Chloride, mg/l	5.0	5.0	2724	12	34	47	51	08/23/11	HLB	SM4500-CLB
Total Dissolved Residue, mg/l	1.0	1.0	4530	435	1280	589	391	08/24/11	MEL	SM2540C
Sulfate, mg/l	5.0	250.0	213 J	194 J	626	257	--- U	08/23/11	TRB	SM426C
Antimony, ug/l	0.14	6.0	--- U	--- U	0.26 J	--- U	--- U	08/31/11	CMF	EPA200.8
Arsenic, ug/l	0.10	10.0	4.2 J		5.8 J			08/31/11	CMF	EPA200.8
Arsenic, ug/l	0.10	10.0		21		1.7 J	5.5 J	09/06/11	CMF	SM3113B
Barium, ug/l	0.02	100.0	253	35.8 J	63.1 J	50.1 J	59.8 J	08/31/11	CMF	EPA200.8
Beryllium, ug/l	0.02	1.0	0.74 J	0.18 J	0.22 J	0.07 J	0.10 J	08/31/11	CMF	EPA200.8
Cadmium, ug/l	0.02	1.0	--- U	0.16 J	0.11 J	0.10 J	0.07 J	08/31/11	CMF	EPA200.8
Cobalt, ug/l	0.03	10.0	0.12 J	5.6 J	0.51 J	0.74 J	0.54 J	08/31/11	CMF	EPA200.8
Copper, ug/l	0.02	10.0	7.7 J	2.8 J	1.3 J	1.3 J	0.85 J	08/31/11	CMF	EPA200.8
Total Chromium, ug/l	0.04	10.0	4.5 J	6.1 J	3.9 J	2.1 J	1.2 J	08/31/11	CMF	EPA200.8
Iron, ug/l	15.9	300.0	31125	194750	116250	18880	26700	09/01/11	ADD	SM3111B
Manganese, ug/l	0.61	50.0	101	162	537	257	579	08/26/11	LFJ	EPA200.7
Lead, ug/l	0.02	10.0	0.11 J	2.6 J	1.00 J	1.4 J	0.74 J	08/31/11	CMF	EPA200.8
Mercury, ug/l	0.05	0.20	--- U	--- U	--- U	--- U	--- U	08/31/11	CMF	EPA200.8
Nickel, ug/l	0.04	50.0	1.3 J	7.1 J	2.3 J	1.5 J	2.3 J	08/31/11	CMF	EPA200.8
Selenium, ug/l	0.20	10.0	--- U					09/07/11	CMF	SM3113B
Selenium, ug/l	0.20	10.0		1.0 J	1.1 J	0.41 J	0.34 J	08/31/11	CMF	EPA200.8
Silver, ug/l	0.02	10.0	--- U	--- U	--- U	--- U	--- U	08/31/11	CMF	EPA200.8
Thallium, ug/l	0.02	5.5	0.05 J	0.12 J	0.05 J	0.08 J	0.03 J	08/31/11	CMF	EPA200.8
Vanadium, ug/l	0.14	25.0	8.4 J	9.4 J	7.5 J	3.6 J	3.7 J	08/31/11	CMF	EPA200.8
Zinc, ug/l	0.24	10.0	3.1 J	47	5.3 J	5.6 J	6.5 J	08/31/11	CMF	EPA200.8
Conductivity (at 25c), uMhos	1.0	1.0	5073	430	1142	740	534	08/22/11	RJH	SM2510B
Temperature, °C			21	23	22	21	20	08/22/11	RJH	SM2550B
Static Water Level, feet			3.35	8.26	6.40	6.27	5.65	08/22/11	RJH	
Well Depth, feet			19.17	22.75	21.97	20.42	22.65	08/22/11	RJH	

J = Between MDL and SWSL, U = Below ALL Quanititation 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

CLIENT ID: 6051

ANALYST: MAO
DATE COLLECTED: 08/22/11
DATE REPORTED: 09/09/11

REVIEWED BY: _____

VOLATILE ORGANICS
EPA METHOD 8260B

PARAMETERS, ug/l	MDL	SWSL	Date Analyzed: 08/23/11 Upstream	08/23/11 Downstream	08/24/11 MW-1	08/23/11 MW-2	08/25/11 MW-3
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

J = Between MDL and SWSL, U = Below ALL Quanititation Limite.

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: 08/22/11
DATE REPORTED: 09/09/11

REVIEWED BY:

VOLATILE ORGANICS
EPA METHOD 8260B

PARAMETERS, ug/l	MDL	SWSL	Date Analyzed: 08/23/11 Upstream	08/23/11 Downstream	08/24/11 MW-1	08/23/11 MW-2	08/25/11 MW-3
48. Tetrahydrofuran	0.39	1.0	--- U	--- U	--- U	--- U	--- U

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VOLATILE ORGANICS
EPA METHOD 8260B

PARAMETERS, ug/l	MDL	SWSL	Date Analyzed: 08/25/11 MW-8	08/25/11 MW-9	08/25/11 MW-10	08/25/11 MW-11	08/25/11 MW-12
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

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

Environment 1, Incorporated

Drinking Water ID: 37715
Wastewater ID: 10

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

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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

CLIENT ID: 6051

ANALYST: MAO
DATE COLLECTED: 08/22/11
DATE REPORTED: 09/09/11

REVIEWED BY: _____

VOLATILE ORGANICS
EPA METHOD 8260B

PARAMETERS, ug/l	MDL	SWSL	Date Analyzed: 08/25/11 MW-8	08/25/11 MW-9	08/25/11 MW-10	08/25/11 MW-11	08/25/11 MW-12
48. Tetrahydrofuran	0.39	1.0	--- U	--- U	--- U	--- U	--- U

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

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VOLATILE ORGANICS
EPA METHOD 8260B

PARAMETERS, ug/l	Date Analyzed: MDL	SWSL	08/25/11 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

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

Environment 1, Incorporated

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VOLATILE ORGANICS
EPA METHOD 8260B

PARAMETERS, ug/l	Date Analyzed: MDL	SWSL	08/25/11 Trip Blank
48. Tetrahydrofuran	0.39	1.0	--- U

J = Between MDL and SWSL, U = Below ALL Quanititation 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: 33**

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

DISINFECTION: ☐ CHLORINE ☐ UV ☐ NONE ☐ _____

	Field pH	Chloride	Sulfate	Metals + Hg/Fe/Mn	Conductivity	Temperature	Field Parameter	EPA 8260B	8260 Dup. 1	8260 Dup. 2	Alkalinity	TDS				
CHLORINE NEUTRALIZED AT COLLECTION																
pH CHECK (LAB)				<2				<2	<2	<2						
CONTAINER TYPE, P/G	P	P	P	P	P	P		G	G	G	P	P				
CHEMICAL PRESERVATION	A	A	A	A	A	A		E	E	E	A	A				

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

SAMPLE LOCATION	COLLECTION DATE	COLLECTION TIME	TOTAL CHLORINE, mg/l OR ug/l AT COLLECTION	TEMPERATURE, °C AT COLLECTION	# OF CONTAINERS	Field pH	Chloride	Sulfate	Metals	Conductivity	Temperature	Field Parameter	EPA 8260B	8260 Dup. 1	8260 Dup. 2	Alkalinity	TDS
Upstream	08/22/11	1135		30	6	G	G	G	G	G	G		G	G		G	G
Downstream	08/22/11	1120		30	6	G	G	G	G	G	G		G	G		G	G
MW-1	08/22/11	0935		20	7	G	G	G	G	G	G	G	G	G	G	G	G
MW-2	08/22/11	1000		20	6	G	G	G	G	G	G	G	G	G		G	G
MW-3	08/22/11	1015		21	6	G	G	G	G	G	G	G	G	G		G	G
MW-8	08/22/11	0920		21	6	G	G	G	G	G	G	G	G	G		G	G
MW-9	08/22/11	1125		23	6	G	G	G	G	G	G	G	G	G		G	G
MW-10	08/22/11	1105		22	6	G	G	G	G	G	G	G	G	G		G	G
MW-11	08/22/11	1050		20	6	G	G	G	G	G	G	G	G	G		G	G
MW-12	08/22/11	1035		20	6	G	G	G	G	G	G	G	G	G		G	G
Trip Blank					2												

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

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

SAMPLES COLLECTED BY: (Please Print) B Hogge Fd

SAMPLES RECEIVED IN LAB AT 1.0 °C

RELINQUISHED BY (SIG.) (SAMPLER)	DATE/TIME	RECEIVED BY (SIG.)	DATE/TIME
Bob Hogge	08/22/11 2:50PM	[signature]	8/22/11 2:50PM
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.

№ 225572

FORM #5

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: 10/18/11
DATE REPORTED : 11/08/11

REVIEWED BY:

PARAMETERS	MDL	SWSL	MW-13	MW-14	MW-15	MW-16	MW-17	Analysis Date	Analyst	Method Code
PH (field measurement), Units			6.6	6.0	7.0	6.1	4.7	10/18/11	RJH	SM4500HB
Total Alkalinity, mg/l	1.0	1.0	296	243	191	154	--- U	10/19/11	TRB	SM2320B
Chloride, mg/l	5.0	5.0	43	38	29	3099	19	10/25/11	HLB	SM4500-CLB
Total Dissolved Residue, mg/l	1.0	1.0	453	298	323	5080	433	10/21/11	HLB	SM2540C
Sulfate, mg/l	5.0	250.0	7.9 J	--- U	30.2 J	207 J	287	10/20/11	TRB	SM426C
Antimony, ug/l	0.14	6.0	--- U	--- U	--- U	0.15 J	--- U	10/25/11	CMF	EPA200.8
Arsenic, ug/l	0.43	10.0	2.7 J			3.7 J		10/25/11	CMF	EPA200.8
Arsenic, ug/l	0.43	10.0		33	13		30	11/02/11	CMF	SM3113B
Barium, ug/l	0.02	100.0	30.0 J	76.8 J	43.0 J	278	63.5 J	10/25/11	CMF	EPA200.8
Beryllium, ug/l	0.02	1.0	0.10 J	0.54 J	0.26 J	0.48 J	1	10/25/11	CMF	EPA200.8
Cadmium, ug/l	0.02	1.0	0.11 J	0.26 J	0.23 J	--- U	0.33 J	10/25/11	CMF	EPA200.8
Cobalt, ug/l	0.03	10.0	0.59 J	0.40 J	1.3 J	0.38 J	3.7 J	10/25/11	CMF	EPA200.8
Copper, ug/l	0.02	10.0	0.78 J	0.57 J	1.6 J	7.6 J	1.4 J	10/25/11	CMF	EPA200.8
Total Chromium, ug/l	0.04	10.0	2.5 J	6.2 J	3.5 J	3.9 J	2.9 J	10/25/11	CMF	EPA200.8
Iron, ug/l	15.9	300.0	21100	74700	43025	29425	47875	11/03/11	ADD	SM3111B
Manganese, ug/l	0.61	50.0	2672	188	292	89	194	11/03/11	LFJ	EPA200.7
Lead, ug/l	0.02	10.0	0.51 J	0.63 J	2.1 J	0.22 J	1.8 J	10/25/11	CMF	EPA200.8
Mercury, ug/l	0.05	0.20	--- U	--- U	--- U	--- U	--- U	10/25/11	CMF	EPA200.8
Nickel, ug/l	0.04	50.0	1.3 J	1.0 J	2.7 J	2.1 J	7.9 J	10/25/11	CMF	EPA200.8
Selenium, ug/l	0.20	10.0	0.59 J	0.50 J	0.28 J		0.91 J	10/25/11	CMF	EPA200.8
Selenium, ug/l	0.20	10.0				--- U		11/03/11	CMF	SM3113B
Silver, ug/l	0.02	10.0	--- U	--- U	--- U	--- U	--- U	10/25/11	CMF	EPA200.8
Thallium, ug/l	0.02	5.5	0.03 J	--- U	0.05 J	--- U	0.03 J	10/25/11	CMF	EPA200.8
Vanadium, ug/l	0.14	25.0	2.8 J	12.0 J	4.7 J	5.5 J	8.3 J	10/25/11	CMF	EPA200.8
Zinc, ug/l	0.24	10.0	4.9 J	3.5 J	354	3.7 J	957	10/25/11	CMF	EPA200.8
Conductivity (at 25c), uMhos/cm	1.0	1.0	659	524	540	6560	598	10/18/11	RJH	SM2510B
Temperature, °C			19	19	19	21	21	10/18/11	RJH	SM2550B
Static Water Level, feet			3.92	4.02	4.71	5.31	4.36	10/18/11	RJH	
Well Depth, feet			22.41	22.02	22.62	20.11	14.78	10/18/11	RJH	

J = Between MDL and SWSL, U = Below ALL Quanititation 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: 10/18/11
DATE REPORTED : 11/08/11

REVIEWED BY:

PARAMETERS	MDL	SWSL	SW-2	Analysis Date	Analyst	Method Code
PH (field measurement), Units			6.6	10/18/11	RJH	SM4500HB
Total Alkalinity, mg/l	1.0	1.0	91	10/19/11	TRB	SM2320B
Chloride, mg/l	5.0	5.0	1170	10/25/11	HLB	SM4500-CLB
Total Dissolved Residue, mg/l	1.0	1.0	2110	10/21/11	HLB	SM2540C
Sulfate, mg/l	5.0	250.0	127 J	10/20/11	TRB	SM426C
Antimony, ug/l	0.14	6.0	0.21 J	10/25/11	CMF	EPA200.8
Arsenic, ug/l	0.10	10.0	3.5 J	10/25/11	CMF	EPA200.8
Barium, ug/l	0.02	100.0	55.3 J	10/25/11	CMF	EPA200.8
Beryllium, ug/l	0.02	1.0	--- U	10/25/11	CMF	EPA200.8
Cadmium, ug/l	0.02	1.0	--- U	10/25/11	CMF	EPA200.8
Cobalt, ug/l	0.03	10.0	0.74 J	10/25/11	CMF	EPA200.8
Copper, ug/l	0.02	10.0	3.3 J	10/25/11	CMF	EPA200.8
Total Chromium, ug/l	0.04	10.0	0.70 J	10/25/11	CMF	EPA200.8
Iron, ug/l	15.9	300.0	2396	11/03/11	ADD	SM3111B
Manganese, ug/l	0.61	50.0	153	11/03/11	LFJ	EPA200.7
Lead, ug/l	0.02	10.0	13	10/25/11	CMF	EPA200.8
Mercury, ug/l	0.05	0.20	--- U	10/25/11	CMF	EPA200.8
Nickel, ug/l	0.04	50.0	2.7 J	10/25/11	CMF	EPA200.8
Selenium, ug/l	0.20	10.0	7.4 J	10/25/11	CMF	EPA200.8
Silver, ug/l	0.02	10.0	--- U	10/25/11	CMF	EPA200.8
Thallium, ug/l	0.02	5.5	--- U	10/25/11	CMF	EPA200.8
Vanadium, ug/l	0.14	25.0	0.94 J	10/25/11	CMF	EPA200.8
Zinc, ug/l	0.24	10.0	9.4 J	10/25/11	CMF	EPA200.8
Conductivity (at 25c), uMhos/cm	1.0	1.0	3150	10/18/11	RJH	SM2510B
Temperature, °C			21	10/18/11	RJH	SM2550B

J = Between MDL and SWSL, U = Below ALL Quanititation 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 A

ANALYST: MAO
DATE COLLECTED: 10/18/11
DATE ANALYZED: 10/21/11
DATE REPORTED: 11/08/11

REVIEWED BY:

VOLATILE ORGANICS
EPA METHOD 8260B

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 Quanititation 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 A

ANALYST: MAO
DATE COLLECTED: 10/18/11
DATE ANALYZED: 10/21/11
DATE REPORTED: 11/08/11

REVIEWED BY:

VOLATILE ORGANICS
EPA METHOD 8260B

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

J = Between MDL and SWSL, U = Below ALL Quanititation 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 A **Week:** 1

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	Temperature	Field Parameter	EPA 8260B	8260 Dup. 1	8260 Dup. 2
CHLORINE NEUTRALIZED AT COLLECTION																	
pH CHECK (LAB)											L2				L2	L2	L2
CONTAINER TYPE, P/G						P	P	P	P	P	P	P	P		G	G	G
CHEMICAL PRESERVATION						A	A	A	A	A	A	A	A		E	E	E
MW-13	10/18/11	1115		19	7	G	G	G	G	G	G	G	G	G	G	G	G
MW-14	10/18/11	1100		19	7	G	G	G	G	G	G	G	G	G	G	G	
MW-15	10/18/11	1045		19	7	G	G	G	G	G	G	G	G	G	G	G	
MW-16	10/18/11	1020		21	7	G	G	G	G	G	G	G	G	G	G	G	
MW-17	10/18/11	1135		21	7	G	G	G	G	G	G	G	G	G	G	G	
Trip Blank	10				2												
SW 2	10/18/11	1150		21		G	G	G	G	G	G	G	G		G	G	

PARAMETERS

A - NONE D - NAOH
B - HNO_3 E - HCL
C - H_2SO_4 F - ZINC ACETATE
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) [signature]

SAMPLES RECEIVED IN LAB AT 0.2 °C

RELINQUISHED BY (SIG.) (SAMPLER)	DATE/TIME	RECEIVED BY (SIG.)	DATE/TIME
[signature]	10/18/11	[signature]	10/18 308
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

№ 222933