CERTIFICATION OF EFFECTIVENESS

The following statement is based on existing site conditions as of June 4, 2013 and data currently available on subsurface conditions and groundwater flow at the Dare County Solid Waste Management C&D landfill site. Additionally, it is our professional opinion that construction of a landfill may alter subsurface conditions.

In accordance with North Carolina Solid Waste Management Rule .0544(h), I hereby state to the best of my knowledge, information and belief and in my professional opinion as a geological professional, that the water quality monitoring system will be effective in providing detection of a release of hazardous constituents from the Dare County Solid Waste Management Construction and Demolition Landfill to the uppermost aquifer, provided the system is operated and maintained properly.

NORTH CAROLINA
LICENSED
SEAL
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GEOLOGIST
MATHEW F. COLLINS

1/14/2015

Appendix A – Water Quality Monitoring Plan

Table of Contents

Certification of Effectiveness

1 Purpose **1**

2 Scope **1**

3 Geologic Setting **1**

3.1 Geology 2
3.2 Hydrogeology 3
3.2.1 Surficial Aquifer 3
3.2.2 Yorktown Confining Unit 3
3.2.3 Yorktown Aquifer 3

4 Groundwater Monitoring Network **4**

4.1 Existing Monitoring Well Network 4
4.2 Hydraulic Conductivity Testing 7

5 Surface Water Monitoring Plan **7**

6 Sampling and Analysis Plan **7**

6.1 Groundwater and Surface Water Sample Collection 7
6.1.1 Static Water Level Measurements 7
6.1.2 Detection of Immiscible Layers 8
6.1.3 Monitoring Well Evacuation 8
6.1.4 Sample Collection 9
6.2 Sample Preservation and Shipment 10
6.3 Analytical Procedures 10
6.4 Chain of Custody 11
6.5 Quality Assurance/Quality Control 12
6.5.1 Field Duplicates 12
6.5.2 Equipment Rinsate Blanks 12
6.5.3 Trip Blanks 12

7 References **12**

Sheets

Sheet 1 GW and LFG Monitoring Network 5

Tables

Table 1 Groundwater and Surface Water Monitoring System Details 6

Appendix A

Water Quality Monitoring Plan

1 Purpose

The purpose of this Water Quality Monitoring Plan is to address the requirements in Rule .0544(b) and (c) to present a plan for groundwater and surface water monitoring for the proposed Dare County C&D Landfill expansion. This Water Quality Monitoring Plan will replace the approved Plan for Cell 4 which was submitted to the Solid Waste Section by CDM in January 2009 with the Cell 4 Permit to Construct Application. This Water Quality Monitoring Plan includes information on the existing groundwater monitoring network, surface water monitoring plan, sampling and analysis requirements, and detection monitoring requirements. The groundwater monitoring network was designed based on information obtained from previous subsurface investigations and a review of literature pertaining to regional geology and groundwater resources.

2 Scope

The Water Quality Monitoring Plan includes the following elements, in accordance with Rule .0544:

- Design and installation of a groundwater monitoring system, based on site-specific information, to yield groundwater samples from the aquifer that represents the quality of the background groundwater that has not been affected by landfill activities or other man-made activities.
- Design and installation of groundwater monitoring system, based on site-specific information, to yield groundwater samples from the aquifer that represent the quality of groundwater passing the relevant point of compliance.
- Monitor wells designed and constructed in accordance with the applicable North Carolina Well Construction Standards as found in 15A NCAC 2C.
- A Sampling and Analysis Plan that includes procedures and techniques for sample collection, sample preservation and shipment, analytical procedures, chain-of-custody procedures, and quality assurance and quality control.

3 Geologic Setting

The Dare County Construction and Demolition Landfill property is located approximately 2.5 south of the intersection of US-64 and US-264 near Manns Harbor, North Carolina and encompasses an area of approximately 836 acres. With the exception of the landfill cells, the site is flat with natural ground elevations generally ranging from 0 feet msl to 4 feet msl. The C&D landfill property is surrounded by cultivated farmland with some wooded areas. There are several irrigation ditches trending from north to south across the property that discharge to larger east-west trending canals on either side of the property.

The Dare County C&D Landfill is located in the Coastal Plain Physiographic Province. The Coastal Plain of North Carolina is approximately 90 to 150 miles wide from the Atlantic Ocean westward to its boundary with the Piedmont province. The western boundary is generally known as the Fall Line and is recognized as

zones of rapids in streams, indicating a change of gradient as the streams pass from crystalline basement rocks to Coastal Plain sediments (Winner and Coble, 1989). The Coastal Plain consists of two subdivisions: The Tidewater region and the Inner Coastal Plain. The proposed landfill site is located within the Tidewater region. Land surface altitudes in the area range from mean sea level (msl) to 10 feet above msl. The Tidewater region is generally of low relief and contains swampy areas.

The site is located within the Pasquotank (Albermarle Sound) River Basin. Most of the proposed landfill expansion area is currently in-fill areas between existing landfill cells. Future Cell 5 and Phase IV areas are used as farmland that was converted from wetlands.

3.1 Geology

Sediments of the Coastal Plain range from clay to gravel with lesser amounts of marine limestone overlying the crystalline basement rocks. In Dare County, depth to the basement rock is approximately 6,000 feet below land surface. The numbers of individual sedimentary beds of the Coastal Plain increase towards the east, have an easterly dip, and tend to thicken towards the east (Winner and Coble, 1989).

The landfill site is directly underlain by post-Miocene aged surficial deposits and the Yorktown Formation of Pliocene age. The surficial deposits consist of undifferentiated marine and non-marine clastic sediments including very fine to medium grained quartz sand with common shell beds and minor amounts of interbedded silt and clay. Thickness of the surficial deposits in this area range from 70 feet to greater than 100 feet, with the thickness increasing towards the east (CDM, 1998). In the proposed landfill area, the surficial sediments were found to be approximately 65 feet thick.

Typically, the Yorktown formation underlies the surficial deposits. West of the Tidewater Region, the Yorktown formation is thin, but thickens eastward at an approximate rate of 7 feet per mile, and in Dare County, North Carolina, thickness can exceed 500 feet (Winner and Coble, 1989). The Yorktown formation is composed largely of fine sand, silty and clayey sand, and clay and is characterized by shells and indurated shell beds throughout. Coarser sand and shell beds are not uncommon to the east, but fine sand is the dominant material (Winner and Coble, 1989). At the proposed landfill site, sediments of the Yorktown confining unit formation were encountered at depths of about 65 feet below land surface and typically extended to depths of 85 to 90 feet.

Based on the previous Cell 1&2 investigation by others and subsequent subsurface investigations completed by CDM in 2004, 2007 and 2008, the geology at the site was found to be composed of 5 layered surficial sediment units. The uppermost unit was found to consist of topsoil and organic silt and extended to depths ranging from 8-inches to 2-feet below land surface. Below the topsoil and organic silt, a layer of mottled silty fine sand was encountered. At the Cell 4 site, the thickness of the silty fine sand layer ranged from 1.5 to 2 feet. Below the silty fine sand, a layer of medium gray fine to medium sand was encountered. This layer was generally found to be about 19 feet thick and extended to a depth of about 24 feet below land surface. Some zones of silty sand and coarse sand were encountered within this layer. The next layer encountered was a dark gray sand and silt layer. The sand and silt layer was found to be about 5 to 7 feet thick and extended to about 32 feet below land surface. Beneath the sand and silt layer, a layer of gray, moderate to well sorted fine to medium sand and shell was encountered. This layer was found to extend to approximately 65 feet below land surface. This layer extended to the top of the Yorktown Confining Unit clays (CDM, 2005).

3.2 Hydrogeology

The hydrogeology of the region consists of a series of younger aquifers and confining units overlying Cambrian age basement rocks. For the purposes of this report, only the surficial aquifer and the Yorktown aquifer will be discussed. The Yorktown aquifer and confining unit are comprised of the upper part of the Pungo River, Yorktown and Chowan River formations. The surficial aquifer is primarily made up of Quaternary age surficial deposits.

3.2.1 Surficial Aquifer

Generally, the surficial aquifer within the Coastal Plain consists of Quaternary age deposits near land surface that were deposited in a marginal marine environment, and is mostly made up of shelly, silty sands and thin clay beds. The thickness of the aquifer is variable and ranges from 10 feet in the western portions of the Coastal Plain to more than 100 feet in Camden, Currituck, and Dare Counties (Lautier, 1998). The surficial aquifer at the proposed landfill site was found to be approximately 60 feet thick.

This unit is of major importance to the hydrology of the area because it extends over a large part of the Coastal Plain and infiltration from rainfall provides the bulk of recharge to the underlying aquifers. The surficial aquifer transmits water laterally to canals and swamps and serves as a source bed holding the water that migrates downward to the underlying aquifers. The recharge to the surficial aquifer depends on how quickly rainfall can infiltrate into the aquifer. Recharge rates depend on the capacity of the soils to allow water to migrate downward through the unsaturated zone (Winner and Coble, 1989).

3.2.2 Yorktown Confining Unit

The Yorktown confining unit consists of a series of discontinuous clay and silt beds that vary considerably in stratigraphic position between the Chowan River and the upper part of the Yorktown formation (Lautier, 1998). The Yorktown aquifer and its confining unit are entirely overlain by the surficial aquifer in this area and receive some recharge from it. The Yorktown is a leaky aquifer that is in direct contact with streams that have channeled into it or with their alluvial deposits (Lautier, 1998).

The Yorktown confining unit overlies the Yorktown aquifer and serves as the hydrogeologic boundary between the Yorktown aquifer and the surficial aquifer. The average thickness of the Yorktown confining unit is about 22 feet. Westward toward the Fall Line, the confining unit averages about 13 feet thick and eastward near the coast about 40 feet and reaches thicknesses up to 70 feet in some areas (Winner and Coble, 1989). Geophysical logs from test wells installed by CDM in Manns Harbor showed confining unit thicknesses around 60 feet (CDM, 1998).

3.2.3 Yorktown Aquifer

The Yorktown aquifer is the uppermost confined aquifer in the area, and is principally comprised of the Chowan River and Yorktown formations. The Yorktown aquifer is separated into subaquifers due to its complex, discontinuous nature of deposition (Lautier, 1998). The Yorktown aquifer is described as fine to medium grained shelly, clayey sands that were deposited in a shallow marine shelf setting. The Yorktown aquifer is confined regionally by a series of confining beds which do not comprise a single unit, since these beds vary significantly in stratigraphic position (Lautier, 1998). Thickness of the Yorktown aquifer varies from less than 20 feet thick in areas to the west where erosion by stream channels has occurred to greater than 300 feet thick in eastern Dare County.

Winner and Coble (1989) estimated the average hydraulic conductivity for the Yorktown aquifer to be about 22 feet/day. Lautier (1998) reported hydraulic conductivity values ranging from 0.226 to 98 ft/day.

Individual private wells are the only source of water supply currently existing in the area surrounding the site. The nearest water supply is greater than 500 feet in any direction from the landfill. Supply wells in the area are generally completed in the upper Yorktown aquifer at depths ranging from 130 to 200 feet below land surface.

Based on data from the new and existing piezometers and monitoring wells in and around the expansion area, the major groundwater recharge feature at the site is precipitation. Surface drainage at the site is predominately governed by the canals to the north and south of the site. These canals trend in an east/west direction toward the canal along US-264. There are also two smaller ditches on the east and west of the Cell 4 site that discharge surface water to the southern canal along Cub Road. All of the drainage features at the site are man-made. The topography of the expansion area is flat with no discernable topographic features.

4 Groundwater Monitoring Network

This section presents the groundwater monitoring network for the site. No additional monitoring wells are proposed for the facility at this time. Currently wells MW-13, -14, and -15 are located in the Future Cell 5 area. When Cell 5 is completed, wells MW-13, MW-14, and MW-15 will be abandoned and re-installed outside of the Cell 5 limits.

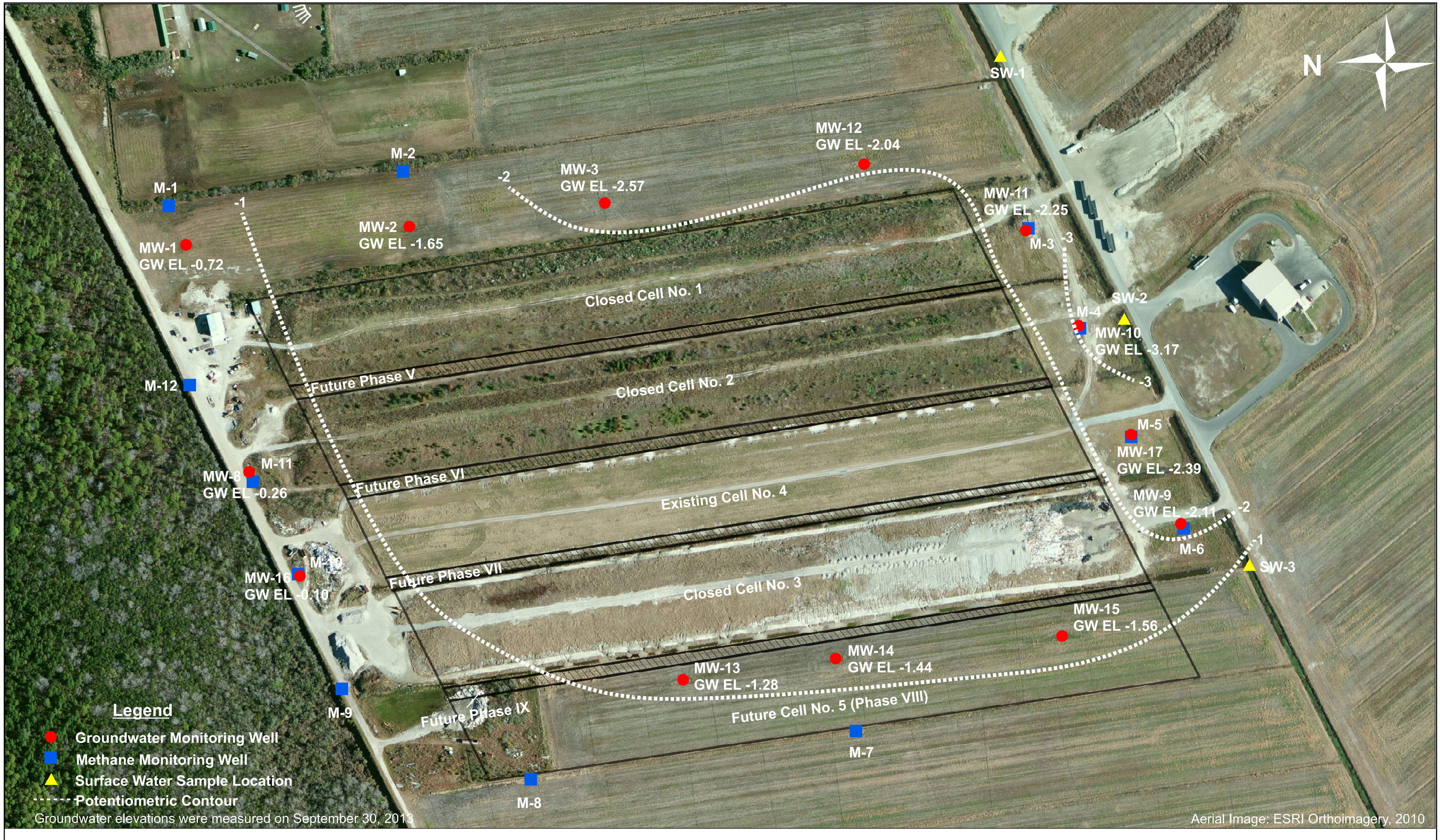
4.1 Existing Monitoring Well Network

The current monitoring system consists of the background well (MW-1) and compliance wells MW-2, MW-3, MW-8, MW-9, MW-10, MW-11, MW-12, MW-13, MW-14, MW-15, MW-16, and MW-17. GW-1 serves as the background well for the entire facility. Monitoring wells MW-2, -3, -11, and -12 monitor Cell 1. Monitoring wells MW-8, and -10 monitor Cell 2. Monitoring wells MW-9, -13, -14, and -15 monitor Cell 3. Monitoring wells MW-16 and MW-17 monitor Cell 4.

Monitoring wells MW-1 through MW-8 were installed in November 1994. Wells (MW-4 and MW-5) were abandoned during Cell 1 construction and wells MW-6 and MW-7 were abandoned during the Cell 4 construction. Monitoring wells MW-9, -10, -11, and -12 were installed in August 2002. Wells MW-13, -14, and -15 were installed in January 2006. Wells MW-16 and MW-17 were installed in July 2010.

The current groundwater and surface water monitoring system is shown on **Sheet 1**. This sheet shows the existing Cells 1 - 4 and the future Phase I – IV and Cell 5 and the relationship of the existing monitor wells to the cells. The location of the current background well (MW-1) is also shown on Sheet 1. Table 1 lists the existing monitoring well network.

The horizontal location of all monitoring wells has been surveyed to State Plane Coordinates by a Registered Land Surveyor to the nearest 0.1 foot. The vertical control or elevation of the top of PVC casing (the well measuring point) has been surveyed to the nearest 0.01 foot accuracy to mean sea level (msl).



CDM Smith

0 250 500 1,000 Feet

Sheet 1: GW and LFG Monitoring Network

Construction and Demolition Landfill Expansion
Substantial Amendment
Dare County, North Carolina

Table 1
Groundwater and Surface Water Monitoring System Details
Dare County Construction and Demolition Landfill Substantial Amendment

EXISTING SITE GROUNDWATER MONITORING WELLS

Well	TOC Elevation (feet AMSL)	Installation Date	Drilling Method	Screen Interval Depth (feet)	Rationale
MW-1	1.61	November 1994	HSA	*10-20*	Background Well
MW-2	1.55	November 1994	HSA	*10-20*	Upgradient of existing Cell 1
MW-3	1.74	November 1994	HSA	*10-20*	Upgradient of existing Cell 1
MW-8	2.90	November 1994	HSA	*5-20*	Upgradient of existing Cell 2/ proposed Phase II
MW-9	4.99	August 2002	HSA	*5-20*	Downgradient of existing Cell 3/ proposed Phases III and IV
MW-10	2.87	August 2002	HSA	*2-20*	Downgradient of existing Cell 2/ proposed Phase II
MW-11	3.56	August 2002	HSA	*2-20*	Downgradient of existing Cell 1/ proposed Phase I
MW-12	2.80	August 2002	HSA	*2-20*	Downgradient of existing Cell 1
MW-13	2.96	January 2006	HSA	*5-20*	Downgradient of existing Cell 3
MW-14	2.96	January 2006	HSA	*5-20*	Downgradient of existing Cell 3
MW-15	3.17	January 2006	HSA	*5-20*	Downgradient of existing Cell 3
MW-16	5.56	July 2010	HSA	*5-20*	Upgradient of existing Cell 4/ proposed Phase III
MW-17	2.85	July 2010	HSA	*5-20*	Downgradient of existing Cell 4/ proposed Phase III

EXISTING SITE SURFACE WATER SAMPLING LOCATIONS

Location	Rationale
SW-1	Up-gradient location, within Cub Road canal.
SW-2	Downgradient of existing Cell 2, within Cub Road canal.
SW-3	Downgradient of existing Cell 3, within Cub Road canal.

4.2 Hydraulic Conductivity Testing

Following installation and development of the newer monitor wells (MW-13, -14, -15, -16, and -17), the hydraulic conductivity of the aquifer material surrounding each well was determined by conducting slug falling head and/or recovery tests on each well. Hydraulic conductivity and estimated effective porosity, along with horizontal gradient, can be used to calculate groundwater flow velocities. Any newly installed wells will be slug-tested.

5 Surface Water Monitoring Plan

There are currently three surface water sampling locations at the site (SW-1, SW-2, and SW-3). No additional surface water sampling locations are proposed at this time. The existing surface water sampling locations are shown on **Sheet 1**.

6 Sampling and Analysis Plan

Rule .0544 states that the owner/operator must provide, as part of the groundwater monitoring program, a groundwater and surface water sampling and analysis (S&A) plan. The S&A plan should be designed to provide accurate results of groundwater quality at the upgradient and downgradient sampling locations. The S&A plan will address the following subjects:

- Groundwater sample collection,
- Sample preservation and shipment,
- Analytical procedures,
- Chain-of-custody,
- Quality assurance/quality control (QA/QC).

6.1 Groundwater and Surface Water Sample Collection

Following initial sampling after well construction, groundwater samples from all wells have been collected on a semi-annual basis. Groundwater samples from each of the monitoring wells and surface water samples will continue to be collected as part of the required semi-annual events.

The following sampling procedures will be performed for all monitoring wells during each sampling event.

6.1.1 Static Water Level Measurements

Static water level elevations will be measured prior to any purging or sampling activities. Static water level data will be used to monitor changes in site hydrogeologic conditions. The following measurements will be recorded in a dedicated field book prior to sample collection:

- Height of the well measuring point above ground surface,
- Depth of water in the well from the TOC measuring point (to the nearest 0.01 foot),
- Total depth of the well,
- Height of the water column in the well casing.

An electronic water level indicator will be used to accurately measure water elevations to within 0.01 foot within the same day in as short a period of time as possible. Each well will have a permanent, easily identified reference point from which all water level measurements will be taken. The reference point will be marked and the elevation surveyed by a North Carolina Registered Land Surveyor.

6.1.2 Detection of Immiscible Layers

USEPA's Technical Manual for Solid Waste Disposal Facility Criteria outlines specifications for groundwater sampling and analysis. One of these specifications outlines the establishment of provisions for detecting immiscible fluids, if applicable. Typically, immiscible fluids are categorized as either, (1) light, non-aqueous phase liquids (L-NAPLs), or (2) dense, non-aqueous phase liquids (D-NAPLs). L-NAPLs are more commonly referred to as "floaters" due to their relatively lighter specific gravity, while D-NAPLs are typically referred to as "sinkers" due to their relatively denser specific gravity.

In most instances, the probability of immiscible fluids being present and subsequently detected in groundwater monitoring wells surrounding C&D landfills is somewhat remote because chemical products (such as industrial solvents) are not accepted for storage or disposal at C&D waste management facilities. However, for those rare instances where a separate immiscible phase is believed to be present, EPA suggests that provisions for detecting these types of fluids should be developed.

The following procedure is proposed to address these concerns in the event that the SWS ever requires this test to be performed. In those instances where the monitoring well's screened interval encompasses the water table surface, the ability to detect and sample light nonaqueous phase liquids (LNAPLs) prior to implementation of routine groundwater sampling activities may exist. To accomplish this objective, a transparent teflon bailer will be lowered into the well to just below the water table surface. The bailer will then be removed from the well and the contents examined to identify if any immiscible fluids are present. If any immiscible fluids are determined to be potentially present, an interface probe is proposed to be used. The depth of the light phase immiscible layer as determined by the interface probe will then be recorded in a field logbook. The interface probe will continue to be lowered until it intersects the groundwater table surface. The depth of the organic/water interface zone also will be recorded. From these two measurements, the thickness of the light phase immiscible layer can be readily determined.

The potential presence of dense phase immiscible layer will be determined by the examination of laboratory analytical results. Analytical results above a percentage of a given chemicals solubility limit can indicate the potential presence of DNAPLs.

As mentioned above, monitoring for immiscible phase fluids is not envisioned to be performed during typical sampling events, but is provided here to document how the test will be performed if the SWS requires it at a future date.

6.1.3 Monitoring Well Evacuation

Following measurement of the static water level in all of the wells, individual wells will be purged of all stagnant water. The stagnant water, which is not representative of true aquifer conditions, will be removed to ensure that fresh formation water can be sampled. A minimum of three well casing volumes will be removed prior to sampling. The volume for 2-inch diameter wells will be calculated using the following equation: one well volume in gallons equals the height of the water column (in feet) times 0.1632 (slightly less than 0.5 gallons per foot water for 3 casing volumes). During the well purging process, field measurements (pH, temperature, specific conductance, turbidity, dissolved oxygen, and

oxidation/reduction potential) will be collected at regular intervals, and reported in a tabular format. The well will be purged until field measurements stabilize within approximately 10 percent between subsequent readings or until the well goes dry. Stabilization of these measurements will indicate that fresh formation water is present. Field measurements of pH, temperature, conductivity, dissolved oxygen, and oxidation/reduction potential will be obtained by using a YSI 556 Multi-parameter meter or equivalent. Turbidity measurements will be collected with a Lamont meter or equivalent.

If a well is purged to dryness, the samples will be collected after a sufficient volume of water has entered to allow collection of the sample. Wells will be purged using laboratory decontaminated Teflon bailers with new nylon rope or an acceptable pumping device approved by the SWS. Field measurements collected during purging activities will be recorded in the field logbook.

6.1.4 Sample Collection

After purging activities are complete, groundwater samples will be collected for laboratory analysis. Each well will be sampled using a new, laboratory decontaminated Teflon bailer equipped with new nylon rope or by peristaltic pump. Bailers will be used for one well only. Field decontamination of bailers will not be permitted. Both groundwater and surface water samples will be analyzed for North Carolina SWS Appendix I Volatile Organic Compounds (VOC) plus tetrahydrofuran; Appendix I metals plus iron, mercury, and manganese; alkalinity, chloride, sulfate, and Total Dissolved Solids.

The bailers will be lowered slowly into the well to minimize sample agitation. Sample water will be placed directly into sample bottles provided by the analytical laboratory, using the following method:

1. Retrieve bailer and slowly transfer sample water to the appropriate sample container. The bailer should not be allowed to touch the sample container.

2. The sample container for metals should be filled first. The container for these analyses should be filled to the bottle shoulder. The sample container will come pre-preserved from the laboratory.

3. The sample bottles for the wet chemistry parameters (alkalinity, chloride, sulfate, and Total Dissolved Solids) should then be filled. These containers should be filled to the bottle shoulder. Preservative, where applicable, will be added by the laboratory prior to shipping.

4. The sample container for the Volatile Organic Compounds should then be filled last, leaving no headspace or bubbles. The container should then be tightly sealed. The sample bottle will come pre-preserved from the laboratory.

Surface water samples will be obtained from areas of minimal turbulence and aeration. The following procedure will be implemented regarding sampling of surface waters:

1. Hold the bottle near the bottom with one hand, and with the other, remove the cap.

2. Push the sample container slowly into the water and tilt up towards the current to fill. A depth of about six inches is satisfactory. Avoid breaching the surface while filling the container.

3. The container should be moved slowly, in a lateral direction, if there is little current movement.

4. If the canal depths are too shallow to allow submersion of the sample container, a pool may be scooped out of the channel bottom and allowed to clear prior to sampling.

5. Lift the container from the water and place the uncontaminated cap on the container.

The wells and surface water stations will be sampled in the order of potential for increasing contamination levels beginning with the upgradient (background) sampling locations.

The samples will be transferred from the sampling equipment directly into a pre-preserved sample container provided by the laboratory. Field filtering of samples is not permitted. There will be a specific size and type of container provided for each constituent to be analyzed. For VOC analysis, the containers provided will be pre-preserved 40-ml glass vials. For metals analysis, the samples will be collected in pre-preserved 500-ml HDPE bottles. Chloride, sulfate, alkalinity and TDS will be collected in unpreserved 500-ml HDPE bottles. Extra containers should be provided in case of accidental breakage.

All field personnel will wear protective latex disposable gloves in order to prevent extrinsic contamination from clothing, body oils, dirt, and other various contaminants. Sample documentation requirements to ensure sample integrity, will include sample locations, date and time of sample collection, proper analysis, and preservative (if applicable).

6.2 Sample Preservation and Shipment

In order to ensure sample integrity, preservation and shipment procedures will be carefully monitored. Generally, ice and chemical additives will be used as sample preservatives, as recommended by the commercial laboratory. For VOC analysis, hydrochloric acid will be used as the preservation method as well as maintaining the samples at a temperature of 4°C. Nitric acid will be used as the preservative for samples needing metals analysis.

If the analytical laboratory is located some distance from the site, samples shall be shipped via a 24-hour delivery service to ensure holding times are not exceeded. Shipment of samples will be coordinated with the laboratory. Proper storage and transport conditions must be maintained in order to preserve the integrity of the sample. Once taken, samples will be placed on ice and cooled to a temperature of 4°C. Samples are to be packed in coolers to maintain temperature and inhibit breakage or accidental spills.

Custody seals will be placed on the outside of the cooler, to detect tampering of the samples. The laboratory shall immediately notify the owner/operator of any samples that arrive with custody seals broken.

6.3 Analytical Procedures

The samples taken from each well and from the surface water sampling locations will be analyzed for the constituents listed in 40 CFR Part 258, Appendix I. The analytical procedures for the indicated parameters will be conducted using the following methods:

Analysis	EPA Method Number
Volatile organic compounds + THF	8260
Total metals	6010
Mercury	7470
Chloride	300.0
Sulfate	300.0
Alkalinity	SM 2320B
Total Dissolved Solids	SM 2540C

6.4 Chain of Custody

It is imperative that an accurate record of sample collection, transport, analysis, and disposal be maintained and documented. Therefore, chain-of-custody procedures will be instituted and followed throughout the sampling program. It is necessary to establish documentation to trace sample possession from the time of collection until disposal. The chain-of-custody program shall include the following requirements:

- Samples shall be accompanied by a chain-of-custody record that notes the date and time of collection as well as sampling personnel.
- All samples shall be properly labeled to prevent misidentification of samples.
- Field notes shall be included to provide pertinent information about each sample.
- A sample analysis sheet shall accompany all samples to the laboratory.
- Sample custody seals shall be used to indicate any tampering of samples.
- All records pertaining to the shipment of a sample shall be retained (freight bills, post office receipts, and bills of lading).

The laboratory shall not accept samples for analysis without a correctly prepared chain-of-custody form. The laboratory shall be responsible for maintaining chain-of-custody of the sample(s) from time of receipt to disposal. The chain-of-custody form shall be signed by each individual who possesses the samples.

To prevent sample misidentification, a label will be affixed to each sample container in a manner as to prevent the label from becoming dislodged during transport. The sample labels will contain the following information:

- Sample identification number.
- Name and signature of sample collector.
- Date and time of collection.

- Place of collection.
- Parameters requested.
- Sample preservative.

In addition the container itself should be labeled with the sample identification number, at a minimum, to allow for identification should the label fall off.

6.5 Quality Assurance/Quality Control

The reliability and validity of the field and analytical laboratory data will be monitored as part of the QA/QC program used in the laboratory. Field duplicates and sample blanks will be collected to check sampling protocol and to account for any changes that occur after sampling. The QA/QC program will stipulate the use of standards, laboratory blanks, and duplicates for identification of matrix interferences.

6.5.1 Field Duplicates

Field duplicates provide a measure of field and laboratory precision. Field duplicates will be collected from identical locations using proper sampling procedures. The duplicate samples will be collected at a frequency of one per day per sampling event.

6.5.2 Equipment Rinsate Blanks

To evaluate the effectiveness of the decontamination procedures, equipment rinsate blanks will be collected. The sample will be collected by passing distilled water through the sampling equipment after decontamination has been completed. Equipment blanks will be collected at a minimum of one per day of groundwater sampling activities.

6.5.3 Trip Blanks

A trip blank shall be prepared to account for any sample contamination that may occur during transport to and from the site. The sample will be prepared in the laboratory with deionized or distilled water and shall accompany the sample shipping container to the field. The trip blank shall remain unopened until receipt by the lab for analysis. One trip blank per sampling event will be collected.

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