January 6, 2010

Permit No.	Date	Document ID No.
33-01	**January 06, 2010**	**9255**

Mr. Ming Chao
Environmental Engineer II
NCDENR DWM-Solid Waste Section
401 Oberlin Road, Suite 150
Raleigh, NC 27605

RECEIVED
January 06, 2010 via an e-mail
Solid Waste Section
Raleigh Central Office

Reference: C&D Landfill Permit Application Renewal
WQMP Question
Edgecombe County land Fill (Permit #33-01)
Tarboro, North Carolina
S&ME Project No. 1054-07-242

Dear Mr. Chao:

On behalf of Edgecombe County, S&ME, Inc. (S&ME) has attached one hard copy and an emailed electronic copy of this response to your question concerning Edgecombe County's Water Quality Monitoring Plan (WQMP) dated June 30, 2008 and revised August 2009 by S&ME. In your telephone conversation with David Wells of S&ME on January 5, 2010, you requested clarification of the text in the WQMP Section 3.2 Sample Locations.

To further clarify the monitor wells comprising the facility water quality monitoring network, S&ME has edited the text of the WQMP presented in the C&D Landfill Permit Application Renewal Appendix II of Section B Operation and Waste Acceptance Plan as follows:

3.2.1 Post Corrective Measures Construction

After construction of the groundwater corrective measures devices is complete, the groundwater monitoring system will consists of: nine (9) downgradient groundwater monitor wells. Four of the nine monitor wells (MW-1B, MW-5, MW-6, and MW-12) will be used for detection and/or assessment monitoring program compliance wells. Five downgradient monitor wells (MW-11, MW-13, MW-14, MW-15, and MW-16) will be used to monitor groundwater corrective measures and groundwater levels. The groundwater monitoring system will include three (3) upgradient groundwater monitor wells; two (MW-4 and MW-9A) for detection and/or assessment monitoring program background wells, and one (MW-3B) to monitor groundwater corrective measures and groundwater levels. Thirteen (13) piezometers (**Table 1**) and six (6) monitor wells (MW-5S, MW-5D, MW-7A, MW-8A, MW-9, and MW-10) will be used for measuring groundwater levels. Two surface water sample locations (upstream and downstream) marked by staff gauges installed in the channel of Jerry's Creek will also be monitored for detection and/or assessment monitoring program compliance points.

Pages 20 through 27, Table 5, Table 8, and Figure 2 of the WQMP Plan are attached and should replace those pages previously submitted in the C&D Landfill Permit Application Renewal package. At this time Edgecombe County's compliance monitoring network is analyzed for Appendix I volatile organic compounds and inorganic compounds.

Please call us at (919) 872-2660 if you have any questions or comments, or if we can be of further assistance.

Sincerely,
S&ME, Inc.

David B. Wells, P.G.
Project Manager

Samuel P. Watts, P.G.
Senior Consultant

cc: Mr. Ervin Lane – Solid Waste Section
Mr. Danny Bagley - Edgecombe County Solid Waste Manager
File

Insert the following Attachments into the Permit Application, Edgecombe County *C&D Landfill (Permit #33-01)*, dated June 30, 2008, Revised August 2009, as Revision 2, Permit Application, Edgecombe County *C&D Landfill (Permit #33-01)* dated November 2009:

ATTACHMENTS:

Attachment 1 Section B – Operation and Waste Acceptance Plan Appendix II (Water Quality Monitoring Plan Pages 20 through 27, Tables 5 and 8, and Figure 2)

Attachment 1 Section B – Operation and Waste Acceptance Plan Appendix II

(Water Quality Monitoring Plan Pages 20 through 27, Tables 5 and 8, and Figure 2)

- Change gloves after preliminary activities, after collecting all the samples at a single sampling point, if torn or used to handle extremely dirty or highly contaminated surfaces. Properly dispose of all used gloves as investigation derived wastes.

Properly manage all investigative derived waste (IDW).

- To prevent carry over of contamination into previously uncontaminated areas, IDW should be properly managed. This includes all water, soil, drilling mud, decontamination wastes, discarded personal protective equipment (PPE), etc. from site investigations, exploratory borings, piezometer and monitoring well installation, refurbishment, abandonment, and other investigative activities. Manage all IDW that is determined to be RCRA-regulated hazardous waste according to the local, state and federal requirements.
- Properly dispose of IDW that is not a RCRA-regulated hazardous waste but is contaminated above the Department's Soil Cleanup Target Levels or the state standards and/or minimum criteria for ground water quality. If the drill cuttings/mud or purged well water is contaminated with hazardous waste, the DWM, Hazardous Waste Section (919-508-8400) should be consulted for disposal options. Containers holding IDW should be maintained in good condition. Containers should be periodically inspected for damage and to ensure that all required labeling (DOT, RCRA, etc.) is clearly visible.

3.2 Sample Locations

The monitor wells that will be sampled semiannually are or will be installed typically in the water table upper-most aquifer. One monitor well on-site (MW-5D) is constructed as a Type III double-cased monitor well with the well screen submerged below the water table. The locations of existing and proposed monitor wells and piezometers which make up the water quality monitoring network are depicted on **Figure 2** and are described in **Sections 2.2 and 2.3**.

3.2.1 Pre Corrective Measures Construction

Currently the groundwater monitoring system consists of: nine (9) downgradient groundwater monitor wells; three (3) upgradient groundwater monitor wells; thirteen (13) piezometers; and, four (4) monitor wells for measuring groundwater levels. Two surface water sample locations (upstream and downstream) marked by staff gauges installed in the channel of Jerry's Creek are also monitored.

3.2.2 Post Corrective Measures Construction

After construction of the groundwater corrective measures devices is complete, the groundwater monitoring system will consists of: nine (9) downgradient groundwater monitor wells. Four of the nine monitor wells (MW-1B, MW-5, MW-6, and MW-12) will be used for detection and/or assessment monitoring program compliance wells. Five downgradient monitor wells (MW-11, MW-13, MW-14, MW-15, and MW-16) will be used to monitor groundwater corrective measures and groundwater levels. The

groundwater monitoring system will include three (3) upgradient groundwater monitor wells; two (MW-4 and MW-9A) for detection and/or assessment monitoring program background wells, and one (MW-3B) to monitor groundwater corrective measures and groundwater levels. Thirteen (13) piezometers (**Table 1**) and six (6) monitor wells (MW-5S, MW-5D, MW-7A, MW-8A, MW-9, and MW-10) will be used for measuring groundwater levels. Two surface water sample locations (upstream and downstream) marked by staff gauges installed in the channel of Jerry's Creek will also be monitored for detection and/or assessment monitoring program compliance points.

3.3 Sample Frequency

Two independent sampling events are required annually by the NCDENR DWM. The schedule for sampling the background, compliance and surface water sample locations identified for WQMP will be on a semiannual basis for 30 years post-closure of the MSW landfill. For each year, one sampling event will be in the summer (June/July) and the second in the winter (December/January), approximately six months apart. The detection and/or assessment monitoring schedule and parameters that will be analyzed are summarized in **Table 5**. The parameter list of Appendix I Detection Monitoring Constituents is presented in **Table 6.** Assessment monitoring will be performed based on constituent concentrations detected during Detection Monitoring. Parameters analyzed during Assessment Monitoring are listed in **Table 7.**

Monitored natural Attenuation (MNA) parameters listed in **Table 8** will be analyzed to review natural attenuation on a semiannual basis for four consecutive monitoring events in order to establish comprehensive baseline conditions. At the conclusion of the baseline sampling period, the water quality data will be reviewed to determine which monitor wells need to continue being monitored for MNA parameters and if modifications to the MNA parameter list and sampling frequency are necessary.

3.4 Monitor Well Sampling Procedures

Development, purging and sampling equipment for monitor wells are selected so that all materials are compatible with the sample parameters and comply with state and federal regulatory requirements for sampling. In the event that non-dedicated equipment is used (i.e., reusable water level meters or , development pumps), equipment will be cleaned between wells in accordance with the cleaning procedures for field equipment (ref. **Section 2.4.3** Equipment Decontamination) or standard EPA approved methods.

Sampling activities for monitor wells will consist of the following steps:

- Equipment decontamination (water level meter)
- Initial well inspection
- Groundwater level measurements
- Well purging
- Field measurements
- Sample withdrawal and filling containers

These activities are listed in the order in which they will be conducted. The first action for well sampling will be to measure the groundwater levels (**Section 3.4.4**) and evacuate the wells, as described in **Section 3.4.5**. Water levels will be measured and wells evacuated prior to collecting the water quality samples. Due to the number of wells to be sampled, it may require two days to sample all the wells. In this event, only the wells that will be sampled that day will be evacuated. Groundwater levels for the network monitor wells and piezometers will be obtained within a 48-hour period.

After the wells have been evacuated groundwater samples will be collected as described in **Section 3.4.6**. Sample collection will start with the first well that was evacuated and will continue in the order of evacuation. The evacuation and sampling order will be conducted from the least contaminated well to the most contaminated well based on historical laboratory results.

3.4.1 Equipment Decontamination

The water level meter and sampling equipment used to perform procedures required for sampling will be decontaminated in general accordance with the methods outlined in **Section 2.4.3** of this plan.

3.4.2 Initial Inspection

The sampling area around the wellhead should be prepared and an initial inspection of the well should be conducted prior to sampling. Activities should be performed to prevent cross contamination or environmental contamination. Fuel-powered equipment and other support equipment which might impact sample quality should be placed away from sampling activities (e.g., purging, sampling, decontamination) in the downwind direction.

1. Remove the well cover and remove all standing water around the top of the well casing (manhole) before opening the well.
2. Inspect the exterior protective casing of the monitoring well for damage. Document the results of the inspection if there is a problem.
3. Place a protective covering around the well head. Replace the covering if it becomes soiled or ripped during sampling.
4. Inspect the well lock and determine whether the cap fits tightly. Replace the cap if necessary.

Observations, including site conditions, personnel, equipment, etc. should be recorded in the field logbook, or sample data collection form, and repairs should be made as necessary to maintain integrity of the well and the dedicated sampling equipment.

3.4.3 Groundwater Level Measurements

Groundwater levels for the network monitor wells and piezometers will be obtained within a 48-hour period. Water levels will be measured with an electronic water level indicator that consists of a spool of dual conductor wire, a probe attached to the end, and an audible and/or visual alarm. When the probe comes in contact with water, the circuit is closed and a meter buzzer and/or light attached to the spool signals the contact. Before the water level measurement is made, the measuring device will be decontaminated and

site personnel will don proper personal protective equipment (PPE) before initiating site monitoring activities in accordance with the site Health and Safety Plan.

Monitor wells and piezometers will be gauged in order from least to most contaminated (based on total VOC concentrations) from the most recent analytical data from the well. The collection order will minimize potential impacts to sample locations from cross contamination or carry-over. The depth to groundwater will be measured in all monitoring wells during each semiannual groundwater monitoring event. The water level will be measured by slowly lowering the instrument probe into the well until the water level indictor contacts the water activating an alarm. The depth to the water from the highest point on the well casing will be measured and recorded to the nearest 0.01 foot. After the measurement is made, the water level probe and lead will be cleaned with a detergent and potable water solution, and rinsed with clean deionized or HPLC water.

Total well depth measurements (bottom of well) have been taken at each of the existing monitor wells. Total well measurements should not be taken during sampling events at monitor wells equipped with dedicated bladder pumps, or other low flow sampling equipment. Attempts to collect total depth measurements at wells with dedicated sampling equipment may damage the sampling equipment, wedge the measurement tools, or unnecessarily agitate water inside the well.

If a well is to be sampled, which is not equipped with dedicated sampling equipment, total depth measurements should be taken using decontaminated sampling equipment to calculate the volume of water in the well as described in **Section 3.4.4.2**.

3.4.4 Well Evacuation (Purging) and Sampling

First attempts to collect the water quality samples from monitor wells will be made using low flow purging and sampling equipment and techniques. The low flow sampling technique is most representative of the water in the formation adjacent to the well screen when the pump discharge does not draw down the water level in the well. Monitor wells will be purged in order from least to most contaminated (based on total VOC concentrations) from the most recent analytical data from the well. The sample collection order will minimize potential impacts to sample locations from cross contamination or carry-over. During purging activities the multi meter, flow through cell and measuring devices will be decontaminated between locations and site personnel will don proper PPE and change gloves before initiating site monitoring activities in accordance with the Health and Safety Plan. Investigation derived waste (IDW) such as nitrile gloves and used sample tubing will be disposed of in accordance with solid waste rules. Liquid wastes will be stored on-site and properly disposed after the analytical data is used to characterize the waste for disposal.

3.4.4.1 Low Flow Purging with Peristaltic Pump or Dedicated Bladder Pump

Equipment Set Up - Monitor wells at the Edgecombe County landfill will be equipped with dedicated down-hole sample tubing. The flexible Teflon®-lined tubing section will be inserted into each well so that the end of the tubing is located approximately mid-point of the saturated section of the well screen. The tubing will be Teflon®-lined polyethylene

or Teflon®-lined PVC material with an approximate outside diameter of 0.375 inches. The tubing will be dedicated to the well and remain in the well between sampling events. This tubing has been approved by the DWM for sites using dedicated sampling pumps.

The flexible Teflon®-lined tubing will be attached to a short length of new flexible peristaltic pump tubing made of silicon, or other non-reactive tubing designed for use with peristaltic pumps and compatible with the constituents that may be present in groundwater. A new section of flexible tubing will be used one time at each well. Flexible tubing will not be reused between wells or subsequent sample events. A variable-speed peristaltic pump will be used that is capable of generating flow rates less than 100 milliliters per minute.

Purge Method - The following low flow purging technique will be employed. The stagnant water in the tubing from the previous sampling event will be removed by operating the pump to remove a minimum of one discharge tubing volume. This is estimated to be approximately 200 ml. It is recommended that the initial purge water be discharged to a container to bypass the flow cell and multi meter to avoid fowling with sediment. Once the initial sediment load in the purge water is cleared, then attach flow to the cell for monitoring. The pump will be operated at a low flow rate during purging. This rate will be less than the well recovery rate and in no case will exceed 500 ml/min. Also, the purge rate will be low enough that recharge water does not become excessively agitated or that colloids are drawn into the well bore. The recovery rate of the well will be evaluated during pumping with the use of a decontaminated water level probe.

Water levels should be measured in the well during well purging to determine drawdown of water within the well. The pumping rate should be adjusted in the well to reduce or negate drawdown in the well. If water levels are drawn down, the stagnant water portion of the water column can become mixed. If this occurs, a modified low flow method should be employed.

Water should be purged from the screened interval of the well at a flow rate ≤ 0.10 liter/minute. If large volumes of groundwater are needed for analyses, sampling time can be increased while pumping at low flow rates, or if well yield is adequate, the flow rate may be increased to ≤ 1.0 liter/min.

Representative Sample Volumes - When purging a well that has the pump intake within a fully submerged well screen, and drawdown of water within the well does not cause mixing of the stagnant water column of the well, the following volumes will removed:

- A minimum of one (1) volume of the pump, associated tubing and flow cell (if used) prior to collecting measurements of the field parameters.
- Field parameter measurements should be taken no sooner than two (2) to three (3) minutes apart.
- At least three (3) volumes of the pump, associated tubing and flow cell (if used) should be purged prior to collecting a sample.

Modified Low Flow Sample Volumes - If water levels are drawn down, and it is suspected that the stagnant water portion of the well has become mixed with representative samples from the natural formation, the following well volumes will be removed:

- A minimum of one (1) equivalent well volume is removed prior to measuring the indicator parameters.
- Field parameter measurements should be taken no sooner than two (2) to three (3) minutes apart.

Indicator parameters are recorded until stabilization is achieved (**Section 3.4.5**) and samples are collected (**Section 3.4.6**).

3.4.4.2 Purging with a Bailer

Hand bailing will be performed if low flow techniques are unsuccessful. The following technique will be employed if the samples are collected from a groundwater monitor well which is not equipped with a dedicated bladder pump, if the pump malfunctions, or if no operable peristaltic pump is available. First remove any dedicated sample tubing or equipment from the well and allow the well time for the water level to equilibrate. Using a decontaminated water level meter and either decontaminated or new stainless steel, Teflon®, PVC, or polyethylene bailer (re-usable or disposable), the following procedures will be performed.

Water level measurements will be performed to determine the static groundwater elevations and to calculate the volume of standing water in the well. All depth and water-level measurements will be referenced to the top of the well casing (inner PVC casing) and recorded to the nearest one-hundredth of a foot. Total well depth (if unknown) and water level measurements will be made with an electronic measuring device graduated in feet to the nearest ±0.01 feet. The depth and water level are used to determine that the well has not filled with silt and to calculate the volume of standing well water. The volume of well water (in gallons) is calculated using the following equation:

$$\mathbf{V = h \times \pi r^2 \times (7.48052\ gal/ft^3)}$$

where V = volume of standing water (gallons)
h = height of standing water (feet) = casing depth - water level
r = radius of well casing (feet)

The well depth, water level measurement, and calculated well volume will be recorded in a dedicated field book or sample collection form. After the water level measurements are made, a minimum of three (3) well casing volumes of groundwater will be purged from the wells. If the well is purged dry before the three casing volumes are removed, the well will be allowed to recover to within 90 percent of its original level within 24 hours before sampling without additional bailing.

3.4.5 Field Parameter Measurements

During groundwater purging activities, the well effluent will be sampled and field parameters including temperature, specific conductance, dissolved oxygen (DO),

turbidity, or pH of the groundwater will be measured and recorded after each a volume of groundwater is purged based on the purge method described in **Section 3.4.4.2**.

A multi-parameter water quality monitoring instrument will be used to measure field indicator parameters for establishing representative groundwater. These instruments should be calibrated with reference standards prior to and after each sampling day or in accordance with the manufacturer's specifications. Calibration results will be recorded in the field book or sample data collection form.

Field measurements of chemical parameters will be taken to indicate when purging is complete and sampling may begin. The measurements may be made periodically in accordance with the purge volumes indicated in **Section 3.4.4.2**, or preferably on a continuous basis using a multi-parameter probe installed in a flow cell connected to the outlet of the well pump. If a flow through cell is not used, purge water may be poured into a separate container and used to measure field parameters while sampling. This container shall not be used to fill or store record sample containers or duplicate sample containers. After the static water in the sampling equipment or well is removed by pumping/bailing, then pumping/bailing and monitoring continues until the chemical parameters have stabilized.

The following criteria define stabilization:

Temperature: ± 0.2° C
pH: ± 0.2 Standard pH Units
Conductivity: ± 5% of prior reading
Dissolved Oxygen: ± 10% of prior reading or ± 0.2 mg/L, whichever is greater
Turbidity: ± 10% prior reading or ± 10 NTUs, whichever is greater

3.4.6 Sample Collection

Samples should be collected immediately after purging is complete. The time period between completing the purge and sampling should not exceed six hours. If sample collection does not occur within one hour of purging completion, re-measure the five field parameters: temperature, pH, specific conductance, dissolved oxygen and turbidity, just prior to collecting the sample. If the measured values are not within 10 percent of the previous measurements, re-purge the well. The exception is wells which have been purged dry.

Sampling personnel will wear clean, disposable, non-powdered nitrile gloves during sample collection for each well. Unless field conditions justify other sampling regimens, samples will be collected in the following order:

1. Volatile Organics and Volatile Inorganics
2. Extractable Organics [semi-volatile organics (SVOCs), organochlorine pesticides and PCBs], Petroleum Hydrocarbons, Aggregate Organics and Oil and Grease
3. Total Metals
4. Inorganic Non-metallic, Physical and Aggregate Properties

5. Biological and Microbiological Parameters

If groundwater samples for metal analysis have a turbidity ≤ 10 NTU, the sample is collected and preserved. If turbidity is > 10 NTU, an additional sample may be collected for dissolved metals to be run separately by the laboratory if a metal is detected above groundwater protection standards. Samples collected for dissolved phase metals analysis will be field filtered. The results of the dissolved phase analysis may indicate the occurrence of the suspect metal is a result of high turbidity within the unfiltered sample.

Samples collected for volatile organics analysis will be poured slowly into glass 40-ml VOC containers fitted with Teflon® caps. The containers will be filled to the top to eliminate headspace or air bubbles. Samples collected for metals analysis will be collected in polyethylene containers. The containers are most often plastic bottles containing a small volume of nitric acid preservative. Samples collected for SVOC analysis will be collected following collection of the inorganic compounds. Generally the SVOCs are collected in unpreserved one liter amber bottles. These bottles should be rinsed prior to filling.

3.4.6.1 Sample Collection with a Peristaltic or Bladder Pump

For wells sampled using a peristaltic pump or dedicated bladder pump, the pump and sample tubing will be compatible to chemical constituents likely present at the site. During sample collection with the peristaltic or dedicated bladder pump, the sample containers will be filled directly from the discharge tubing into the sample container without the tubing contacting the well's outer casing, multi-meter flow-through cell, container used to monitor purge parameters (when a flow-through cell is not used) sample bottle, or the ground. The sample will be handled in a way to minimize aeration. The discharge will be regulated so that the sample will be delivered at a slow rate of approximately 100 to 300 ml/min directly into the sampling container with minimal turbulence, aeration, or volatilization. The pump will be operated at a low flow rate until each container has been filled. For the volatile organic containers, no air bubbles or "head-space" will be allowed in the containers. Following sampling, filled sample containers will be labeled and placed in an insulated cooler with ice.

3.4.6.2 Sampling with a Bailer

During sample collection with a bailer, the bailer will be slowly lowered into the water column until full, then slowly retrieved. The sample containers will be filled by slowly pouring the groundwater from the bailer directly into the sample container without the bailer contacting the well's outer casing, sample bottle, or the ground. The sample will be handled in a way to minimize aeration. For the volatile organic containers, no air bubbles or "head-space" will be allowed in the containers. No more than two sample containers per bail should be filled. Following sampling, filled sample containers will be labeled and placed in an insulated cooler with wet ice. The bailers will be properly disposed of following sampling. Field cleaning and re-use of bailers is not recommended. A new disposable bailer is required for each monitoring well.

Table 5
Laboratory Parameters and Schedule
Water Quality Monitoring Plan
Edgecombe County Landfill
Tarboro, North Carolina
S&ME Project No. 1054-07-242

Well ID	Semiannual			Well/Sample Location Status
	Appendix I VOCs and Inorganics	MNA Parameters	Water Levels	
MW-1B	x	x	x	Compliance Network
MW-3B	x	x	x	Corrective Measures
MW-4	x	x	x	Background Network
MW-5	x	x	x	Compliance Network
MW-6	x	x	x	Compliance Network
MW-7A (MW-11)	x	x	x	Temporary Compliance Network Corrective Measures
MW-9 (MW-9A)	x	x	x	Background Network Well to be Replaced
MW-12	x	x	x	Compliance Network
MW-13	x	x	x	Temporary Compliance Network Corrective Measures
MW-14	x	x	x	Temporary Compliance Network Corrective Measures
MW-15	x	x	x	Temporary Compliance Network Corrective Measures
MW-16	x	x	x	Temporary Compliance Network Corrective Measures
Upstream - SW-1	x		x	Staff Guage in Jerry's Creek Compliance Network
Downstream - SW-2	x		x	Staff Guage in Jerry's Creek Compliance Network
P-1			x	Water Levels, Network
P-2A			x	Water Levels, Network
P-3A			x	Water Levels, Network
P-12			x	Water Levels, Network
P-15			x	Water Levels, Network
P-17			x	Water Levels, Network
P-18			x	Water Levels, Network
P-19			x	Water Levels, Network
P-25			x	Water Levels, Network
P-26			x	Water Levels, Network
P-29			x	Water Levels, Network
P-34			x	Water Levels, Network
P-35			x	Water Levels, Network

Notes:
Semiannual = Sample frequency will be summer (June/July) and Winter (december/January) approximately six months apart.
VOCs = Volatile Organic Compounds
LEL = Lower Explosive Limit
Well locations shown on Figure 2.

Table 8
Corrective Measures Monitoring - MNA Parameter Summary
Edgecombe County Landfill
Water Quality Monitoring Plan
Edgecombe County Landfill
Tarboro, North Carolina
S&ME Project No. 1054-07-242
Permit # 33-01

Well ID	USE	40 CFR Part 258 Appendix I COCs	MONITORED NATURAL ATTENUATION PARAMETERS																			
			ph	Temperature	Specific Conductance	Oxygen Reduction Potential ORP	Dissolved Oxygen	Chloride	Sulfate	Alkalinity	BOD	COD	TOC (Total Organic Carbon)	Iron	Nitrate	Sulfide	CO_2	Ethane	Ethene	Methane	Volatile Fatty Acids	Hydrogen
		UNITS	Std	°C	mS/cm	mV	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	nM
MW-1B (MW-16)	Compliance/Corrective Measures	X	X	X	X	X	X	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
MW-3B	Corrective Measures	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	NS	NS	NS	NS	NS	NS
MW-4	Background/Corrective Measures	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
MW-5	Compliance/Corrective Measures	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
MW-6	Compliance/Corrective Measures	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	NS	NS	NS	NS	NS	NS
MW-7A (MW-11)	Corrective Measures	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	NS	NS	NS	NS	NS	NS
MW-9 (MW-9A)	Background/Corrective Measures	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	NS	NS	NS	NS	NS	NS
MW-12	Compliance/Corrective Measures	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	NS	NS	NS	NS	NS	NS
MW-13	Corrective Measures	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
MW-14	Corrective Measures	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	NS	NS	NS	NS	NS	NS
MW-15	Correctrive Measures	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	NS	NS	NS	NS	NS	NS
MW-16	Corrective Measures	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Upstream - SW-1	Compliance/Corrective Measures	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	NS	NS	NS	NS	NS	NS
Downstream - SW-2	Compliance/Corrective Measures	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	NS	NS	NS	NS	NS	NS
P-34	Corrective Measures	X	X	X	X	X	X	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS

NOTES:
Compliance/Corrective Measures = Sample location for compliance and corrective measures. Once corrective measures are complete, the location will be used as a compliance sample point in the Detection Montitoring Program.
Corrective Measures = Sample location for use to monitor corrective measures. Once the corrective measures are complete, no samples for analysis from this well will be required.
Background = Sample location for background levels. Once corrective measures are complete, the location will be used as a background sample point in the Detection Montitoring Program.
X = Samples collected and analyzed for four consecutive sampling events, then the well locations and parameter list will be performed only as required based on select locations therafter.
NS = Not Sampled for this parameter.
mg/L = Milligrams per Liter
Std = Standard Units
°C = Degrees Celsius
mS/cm = Microsiemens per Centimeter
mV = Millivolt
nM = Nanomolar

LEGEND

- METHANE GAS WELL
- SURFACE WATER MONITORING LOCATION
- PIEZOMETER
- MONITOR WELL
- (MW-9A) PROPOSED BACKGROUND NETWORK MONITOR WELL (MW-9A)
- (MW-1B) PROPOSED COMPLIANCE NETWORK MONITOR WELL (MW-1B)
- PROPOSED SURFACE WATER SAMPLE LOCATION
- SOUTHERN MSW LANDFILL APPROX. LIMIT OF WASTE
- PROPERTY LINE
- LIMIT OF DISTURBANCE
- 50-FOOT STREAM BUFFER
- GROUND SURFACE ELEVATION CONTOUR - 10-FOOT INTERVAL
- GROUND SURFACE ELEVATION CONTOUR - 2-FOOT INTERVAL
- FENCE
- SURFACE WATER FEATURE FLOW DIRECTION
- GROUNDWATER CORRECTIVE MEASURES MONITOR WELL (MW-3B, MW-7A, MW-11, MW-13, MW-14, MW-15, P-34)
- DETECTION ASSESSMENT PROGRAM COMPLIANCE MONITOR WELL (MW-16 (OR MW-1B), MW-5, MW-6, MW-12)
- DETECTION ASSESSMENT PROGRAM BACKGROUND MONITOR WELL (MW-4, MW-9)

NOTES:

1. TOPOGRAPHIC MAP DEVELOPED BY GEODATA CORPORATION OF ZEBULON, NC USING PHOTOGRAMETRIC METHODS FROM AERIAL PHOTOGRAPHY FLOWN ON FEBRUARY 5, 2007.
2. TOPOGRAPHIC MAP UPDATED WITH GROUND SURVEY BY BATEMAN CIVIL SURVEY COMPANY, PC OF HOLLY SPRINGS, NC ON OCTOBER 26, 2008.
3. GROUNDWATER MONITOR WELL, PIEZOMETER, AND METHANE GAS MONITOR WELL LOCATIONS SURVEYED BY SPRUILL & ASSOCIATES ON MAY 26, 2002, DECEMBER 23, 2004, AND SEPTEMBER 4, 2007 AND BY BATEMAN CIVIL SURVEY COMPANY, PC, ON OCTOBER 26, 2008.
4. PROPERTY BOUNDARY OBTAINED FROM EDGECOMBE COUNTY GIS DEPARTMENT.

GRAPHIC SCALE

400 0 200 400

(IN FEET)

WRIGHT'S CREEK
JERRY'S CREEK
COLONIAL ROAD
PROPERTY LINE
NORTHERN OLD LANDFILL
SEDIMENTATION BASIN SB-3 (PROPOSED)
SEDIMENTATION BASIN SB-2
SEDIMENTATION BASIN SB-1
Upstream
Prop. Downstream
Downstream
MW-12
MW-6
MW-11
MW-7A
GW-1
MW-13
P-12
P-35
MW-14
MW-5S
P-34
MW-5D
MW-5
MW-15
P-15
P-17
(MW-1B)
MW-16 (INTERIM COMPLIANCE WELL)
GRASS LINED DITCH
GW-10
P-29
P-3A
MSW LANDFILL APPROX. LIMIT OF WASTE
APPROXIMATE LIMIT OF EXISTING C&D WASTE
TIRE COLLECTION AREA
P-18
GW-5
GATE 3 (ENTRANCE)
TRAILER STAGING AREA
CONVENIENCE CENTER
P-19
MSW TRANSFER FACILITY
GW-9
P-26
GW-4
GATE 2
BREAK TRAILER 1
GATE
GATE 1 (EXIT)
(INTERIM BACKGROUND WELL) MW-9
MW-8A (MW-9A)
P-25
P-2A
MSW LANDFILL APPROX. LIMIT OF WASTE
PROPOSED GROUNDWATER BARRIER WALL LOCATION
STORAGE 2 (TRUCK PARKING)
ELECTRONICS / OIL FILTER STORAGE
GW-3
MW-1
BREAK TRAILER 2
SCALE
SCALE HOUSE
PESTICIDE CONTAINER STORAGE BUILDING
POND
WASH AREA
STORAGE 3 (FILTER STORAGE)
P-1
STORAGE 1 (MAINTENANCE SHOP)
GW-8
MW-10
GW-7
GW-6
GW-1R
MW-3B
GW-2R
POND
YARD WASTE PROCESSING AREA
BORROW AREA 1
BORROW AREA 2
WOOD PALLET STAGING AREA
WHITE GOODS STAGING AREA

S&ME
WWW.SMEINC.COM

NO.	DATE	DESCRIPTION	BY

SITE MAP

WATER QUALITY MONITORING PLAN
EDGECOMBE COUNTY LANDFILL
TARBORO, NORTH CAROLINA

DRAWN BY:	CHECKED BY:
BTR	
DESIGNED BY:	APPROVED BY:

PROJECT NUMBER: 1054-07-241A

SCALE:	DATE:
1" = 200'	JAN. 2010

DRAWING NUMBER: D-1122

FIGURE:	OF:
2	

S:\PROJECTS\1054\07\07-241 Edgecombe-Assmt of Corrective Measures\CAD\D1122.dwg, D1122, 1/5/2010 1:58:09 PM, 1:1

From: David Wells [DWells@smeinc.com]
Sent: Wednesday, January 06, 2010 4:41 PM
To: Chao, Ming-tai
Cc: Samuel Watts
Subject: Edgecombe County Water Quality Monitoring Plan clarification
Attachments: D1122-FIG2.pdf; WQMP Clarification.pdf

Good Afternoon Ming,

Per your request, S&ME has edited the text of the WQMP presented in the C&D Landfill Permit Application Renewal Appendix II of Section B Operation and Waste Acceptance Plan as follows:

3.2.1 Post Corrective Measures Construction

After construction of the groundwater corrective measures devices is complete, the groundwater monitoring system will consists of: nine (9) downgradient groundwater monitor wells. Four of the nine monitor wells (MW-1B, MW-5, MW-6, and MW-12) will be used for detection and/or assessment monitoring program compliance wells. Five downgradient monitor wells (MW-11, MW-13, MW-14, MW-15, and MW-16) will be used to monitor groundwater corrective measures and groundwater levels. The groundwater monitoring system will include three (3) upgradient groundwater monitor wells; two (MW-4 and MW-9A) for detection and/or assessment monitoring program background wells, and one (MW-3B) to monitor groundwater corrective measures and groundwater levels. Thirteen (13) piezometers (**Table 1**) and six (6) monitor wells (MW-5S, MW-5D, MW-7A, MW-8A, MW-9, and MW-10) will be used for measuring groundwater levels. Two surface water sample locations (upstream and downstream) marked by staff gauges installed in the channel of Jerry's Creek will also be monitored for detection and/or assessment monitoring program compliance points.

The attached letter includes a copy of the revised pages of the Water Quality Monitoring Plan (Pages 20 through 27, Table 5, Table 8, and Figure 2).

At this time Edgecombe County's compliance monitoring network is analyzed for Appendix I volatile organic compounds and inorganic compounds.

Please call us at (919) 872-2660 if you have any questions or comments, or if we can be of further assistance.

Regards,

David

David B. Wells, P.G.
Senior Geologist

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