RICHARDSON SMITH GARDNER & ASSOCIATES
ENGINEERING & GEOLOGICAL SERVICES

Permit No.	Date	DIN
29-06	**June 21, 2011**	**14199**

June 21, 2011

RECEIVED
June 21, 2011
Solid Waste Section
Asheville Regional Office

Mr. Allen Gaither
Environmental Engineer
NC DENR - Division of Waste Management
2090 US Highway 70
Swannanoa, North Carolina 28778

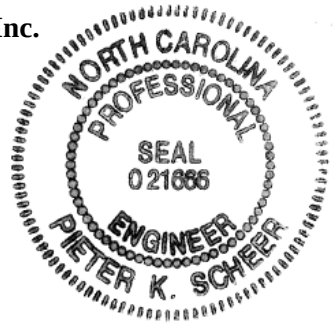
Re: Davidson County C&D Landfill (Permit No. 29-06)
Completeness & Engineering Technical Review Letter
Response to Comments

Dear Mr. Gaither:

On behalf of Davidson County, Richardson Smith Gardner & Associates, Inc. (RSG) would like to respond to your letter dated May 26, 2011 (see **attached**), as follows. The letter requested updated financial assurance information for the facility including an estimate for potential future assessment and corrective action costs, which are now applicable to the facility (per NCGS 130A 295.2(h)). To address this request, RSG has revised the Closure and Post-Closure Plan. A copy of this revised plan is attached.

Please contact me at your earliest convenience with any questions or comments which you may have on this submittal or any further questions or comments you may have on this application.

Sincerely,
Richardson Smith Gardner & Associates, Inc.



Pieter K. Scheer, P.E.
Principal, Project Manager
pieter@rsgengineers.com

Attachments: Revised Closure and Post-Closure Plan

cc: Mr. Charlie Brushwood - Davidson County

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North Carolina Department of Environment and Natural Resources
Division of Waste Management

Dexter R. Matthews
Director

Beverly Eaves Perdue
Governor

Dee Freeman
Secretary

May 26, 2011

Mr. Charles Brushwood
Solid Waste Director
1242 Old Highway 29
Thomasville, North Carolina 27360

Subject: Financial Assurance Cost Estimates
Davidson County C&D Landfill Facility
Davidson County, Permit #29-06, Document ID No. 14022

Mr. Brushwood:

The Division of Waste Management, Solid Waste Section (Section) requires revised Financial Assurance cost estimates prior to issuing the Permit to Construct for Phases 3 and 4 at the Davidson County C&D landfill facility. Per the attached memorandum, which was sent to all landfill facilities, Financial Assurance cost estimates, including closure, post-closure and potential assessment and corrective action costs, must be submitted as part of the application for a new permit or permit amendment. The Permit to Construct submittal (DIN 12223) contained the closure and post-closure cost estimates, but did not include the potential assessment and corrective action costs. It should be noted, post-closure costs related to water quality and landfill gas monitoring systems, including system maintenance, can be moved under the potential assessment and corrective action costs umbrella (contact me for further clarification). Please submit revised Financial Assurance cost estimates in accordance with the attached memorandum at your earliest convenience.

If you should have any questions regarding this matter please contact me at (828) 296-4703, or by email at allen.gaither@ncmail.net .

Sincerely,

Allen Gaither
Environmental Engineer

Attachment: Financial Assurance Process for Solid Waste Management Facilities Memorandum dated October 12, 2010

cc: Mr. Pieter Scheer –RSG
Mr. Donald Herndon – SWS/RCO

2090 US Highway 70, Swannanoa, North Carolina 28778
Phone (828) 296-4500 \ FAX (828) 299-7043 \ Internet http://wastenotnc.org

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North Carolina Department of Environment and Natural Resources
Division of Waste Management

Beverly Eaves Perdue
Governor

Dexter R. Matthews
Director

Dee Freeman
Secretary

October 12, 2010

MEMORANDUM

To: Solid Waste Directors, Finance Directors and Landfill Owners and Operators

From: North Carolina Division of Waste Management, Solid Waste Section

Re: **Financial Assurance Process for Solid Waste Management Facilities**

The purpose of this memo is to clarify the process of providing financial assurance for solid waste management facilities. According to N.C.G.S. 130A-295.2 (f): "The applicant and permit holder for a solid waste management facility shall establish financial assurance…" The acceptable financial assurance mechanisms are outlined in 15A NCAC 13B .1628.

The process for securing and updating financial assurance should be as follows:

- During the application for a new permit or the amendment (five year review cycle) of an existing permit, the applicant shall submit cost estimates for any closure, post closure or corrective action costs associated with the facility.

- The cost estimates shall be reviewed and approved by a Solid Waste Section Permitting Engineer. Please note that for a landfill, the approved cost estimates relate to the "largest area" that the active permit allows.

- The facility shall secure a financial assurance mechanism and submit the original documentation to the Compliance Officer with the Solid Waste Section. It is highly recommended that the facility submit a draft copy for any **NEW** financial assurance mechanisms (excluding the Local Government Financial Test) to the Compliance Officer for review before the mechanism is finalized.

- On the anniversary date of a financial assurance mechanism, the facility shall send an updated financial assurance mechanism that has been adjusted for inflation (using the current inflation factor located on our website http://portal.ncdenr.org/web/wm/sw/financialassurance) from the previous year. Please note that for each year until new cost estimates are reviewed and approved by a Solid Waste Section engineer during the permit amendment process, the **ONLY** adjustment to

the cost estimates should be for inflation. If the facility has increased costs due to environmental assessment or corrective action activities, the facility shall petition the Section for cost estimate adjustment. If the facility petitions the Section for cost estimates to be adjusted for any reason other than inflation, they may be subject to a permitting fee.

Reminders

- The Solid Waste Section will no longer be sending out "approval letters" on an annual basis to facilities after they have submitted their initial or updated financial assurance mechanism. If there is a problem with the financial assurance mechanism, the Solid Waste Section Compliance Officer will contact the facility at that point.

- For facilities that are using the Local Government Financial Test, the deadline for annual submittals is October 29th. All requests for an extension of this deadline must be received by that date.

- In Accordance with NCGS 130A 295.2 (h), all sanitary landfills must provide financial assurance for potential assessment and corrective action in the minimum amount of $3,000,000. This is required when the permit is next subject to renewal after August 1, 2009.

- It is allowable for a facility to secure financial assurance for an amount higher than the cost estimates such that an adjustment does not need to be made for inflation until the mechanism no longer accounts for the inflation adjusted amount. This must be arranged with the Solid Waste Section Compliance Officer prior to implementation.

- For all facilities that use a Surety Bond or Letter of Credit for a financial assurance mechanism, they must also establish a Standby Trust Fund.

- Our website address has changed, and currently, the Financial Assurance page with all relevant information including template language for mechanisms, inflation factors, Solid Waste Rules and general guidance is located at:
  http://portal.ncdenr.org/web/wm/sw/financialassurance

  If you have any questions or concerns, please feel free to contact Donald Herndon (donald.herndon@ncdenr.gov or 919-508-8502) or Shawn McKee (shawn.mckee@ncdenr.gov or 919-508-5812).

  Thank you for your continued cooperation with these matters.

Closure and Post-Closure Plan

Davidson County Landfill
Davidson County, North Carolina

Prepared for:
Davidson County Integrated Solid Waste Management
Thomasville, North Carolina

April 2011
Revised: June 2011

RICHARDSON SMITH GARDNER & ASSOCIATES
ENGINEERING & GEOLOGICAL SERVICES

14 N. BOYLAN AVENUE
RALEIGH, NORTH CAROLINA 27603
NC LIC. NO. C-0828 (ENGINEERING)

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DAVIDSON COUNTY LANDFILL

CLOSURE AND POST-CLOSURE PLAN

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SECTION 1.0
CLOSURE PLAN

1.1 OVERVIEW

This plan is intended to serve as a guide for the proposed closure. A formalized Closure Plan for each landfill unit (or incremental portion thereof) will be submitted to the Solid Waste Section of the North Carolina Department of Environment and Natural Resources Division of Waste Management (DWM) for approval prior to beginning closure construction.

1.2 MAXIMUM CLOSURE AREA AND WASTE CAPACITY

The following are the estimated areas and capacity for each landfill unit to be closed under this plan.

Landfill Unit	Closure Area (Acres)	Gross Capacity (CY)[1]	Net (Waste) Capacity (CY/Tons)[1]
MSW Landfill Units			
Phase 1 (Areas 1 - 3)	15.9 (See Note 2)	2,229,303	1,913,735 CY 1,332,605 Tons
Phase 1 (Areas 1 - 3) Vertical Expansion (See Note 3)	-----	62,100	55,890 CY 43,063 Tons
Phase 2 (Area 1)	14.7	903,896	803,343 CY 582,423 Tons
Total (MSW):	30.6	3,195,299	2,772,968 CY 1,948,091 Tons
C&D Landfill Units			
Phases 1-4	7.6	299,802	249,868 CY 140,350 Tons

Notes:

1. With the exception of the Phase 1 Vertical Expansion (see Note 3), the volume and tonnage figures assumed for MSW landfill unit are based on the currently approved Facility Plan (reference: Permit to Construct Application for Phase 2 Area 1 (Vol. 1 of 2), prepared by Richardson Smith Gardner & Associates, Inc., dated February 2007). Volume and tonnage figures for the C&D landfill are based on the Facility and Engineering Plan submitted as part of the Permit Amendment Application for the Phases 3 and 4 landfill units. Note that the gross capacities reported are from bottom of waste (top of protective cover or subgrade as appropriate) to top of final cover.

2. The area shown for the Phase 1 MSW unit reflects the area remaining to be closed. Approximately 16 acres was closed in 2005 (reference: Partial Closure Construction CQA Certification Report, prepared by Joyce Engineering, Inc., dated November 2005).

3. The volumes shown for the Phase 1 vertical expansion are as reported in the Request for Permit Modification, prepared by Richardson Smith Gardner & Associates, Inc., dated March 2008.

1.3 FINAL COVER SYSTEM

The final cover systems for the MSW and C&D landfill units will consist of the following components (top-down):

MSW Landfill Units:

- a 24-inch thick vegetative soil layer;
- a drainage geocomposite (with drainage breaks);
- a 30-mil textured LLDPE geomembrane; and
- a 12-inch thick intermediate cover layer.

C&D Landfill Units:

- an 18-inch thick vegetative soil layer; and
- an 18-inch thick soil liner with a hydraulic conductivity of no more than 1×10^{-5} cm/sec ("compacted soil barrier").

The final cover system will be placed on prepared intermediate cover at a maximum slope of 4H:1V. Surface water control devices and landfill gas (LFG) components will also be incorporated into the final cover of each landfill unit. The final cover surface will be vegetated upon completion of the final cover installation according to the project seeding specifications.

Where applicable, placement of the vegetative soil layer over the cover geosynthetics must be done with care to avoid damage to these materials. This soil layer should be placed from the bottom up using a small dozer equipped with low ground contact pressure (6 psi or less) tracks. A minimum of 12 inches of soil should be maintained between the dozer tracks and the underlying geosynthetics. The soil buffer should receive no compaction other than that provided by the dozer tracks. Pans or other heavy equipment should not operate on the vegetative soil layer.

Refer to the appropriate permit application for a detailed discussion and details related to the design of the final cover system for each landfill unit.

1.4 LANDFILL GAS SYSTEM

For the MSW landfill units and C&D landfill units, a landfill gas system is provided in the final cover design. This system includes a system of collection wells or vents placed within the waste to capture the gas and either passively vent or flare the gas via utility flares or, as required, actively collect and flare the gas via header piping and a blower/flare system. The collection wells should be placed before any geosynthetics are placed.

Refer to the appropriate permit application for a detailed discussion and details related to the design of the landfill gas system for each landfill unit.

1.5 SURFACE WATER SYSTEMS

Precipitation falling on the cover will infiltrate into the cover or run off the cover. Short-term the run-off runs down the surface of the intermediate cover. Long-term the run-off is collected in a series of drainage breaks built into the areas covered by final cover. These drainage breaks are provided along side slopes (rain gutters and/or diversion berms). Water captured by rain gutters or diversion berms is routed toward one of the down pipes. Flow in the down pipes is routed to the base of the landfill and to one of the site sediment basins.

Refer to the appropriate permit application for a detailed discussion and details related to the design of surface water systems for each landfill unit.

1.5.1 Incremental Operation

During much of the life of the landfill, surface run-off will be handled by the intermediate cover system. Operations must strive to provide operational grading that encourages run-off from the intermediate cover to drain to the perimeter channels along the perimeter berms or to areas covered by final cover. Corrugated polyethylene (CPE) piping and temporary soil diversion berms must be installed if required to accomplish this run-off routing.

1.5.2 Required Maintenance

The surface water systems must be inspected annually and immediately after every major storm. Sediment build-up in the drainage features/devices must be cleaned out on a regular basis to promote run-off. Sediments removed can be used as daily or intermediate cover.

1.6 CLOSURE SCHEDULE

Closure activities must begin on the following schedule:

MSW Landfill Units (15A NCAC 13B.1627(c)(5)):

- No later that 30 days after the date on which the MSWLF unit receives the known final receipt of wastes; or
- If the MSWLF unit has remaining capacity and there is a reasonable likelihood that the MSWLF unit will receive additional wastes, no later than one year after the most recent receipt of wastes.

C&D Landfill Units (15A NCAC 13B.0543(c)(5)):

- No later that 30 days after the date on which the C&DLF unit receives the known final receipt of wastes;
- No later than 30 days after the date that a 10 acre or greater area of waste, is

within in 15 feet of final design grades; or

- No later than one year after the most recent receipt of wastes, if the C&DLF unit has remaining capacity.

Prior to beginning closure of any landfill unit, the County will notify the DWM that a notice of the intent to close the unit has been placed in the operating record.

All closure activities shall be completed within 180 days. Exemptions and extensions may be approved by the DWM.

1.7 CLOSURE VERIFICATION

The following procedures will be implemented following closure:

- A Construction Quality Assurance (CQA) report will be submitted to the DWM. This report will describe the observations and tests used before, during, and upon completion of construction to ensure that the construction materials meet the final cover design specifications and the construction and certification requirements. The CQA report will contain as-built drawings.

- A signed certification from a registered Professional Engineer verifying that closure has been completed in accordance with the closure plan will be submitted to the DWM.

- At least one sign notifying all persons of the closing of the landfill (or incremental portions thereof) and that wastes are no longer accepted will be posted. Suitable barriers will be installed as necessary at former access points to prevent new waste from being deposited.

- Within 90 days, a survey plat, prepared by a registered Professional Land Surveyor, indicating the location and dimensions of landfill disposal areas, will be prepared.

- A notation will be recorded on the deed notifying any potential purchaser of the property that the land has been used as a landfill facility and that future use is restricted under the approved closure plan. A copy of the deed notation as recorded will be filed with the operating record.

SECTION 2.0
POST-CLOSURE PLAN

2.1 OVERVIEW

This Post-Closure Plan has been developed to outline steps to be taken to ensure the integrity of the landfill during its post-closure care period. The post-closure care period will last at least 30 years after final closure and, at a minimum, will consist of the following:

- Maintaining the integrity and effectiveness of final cover system;
- Performing groundwater and surface water monitoring;
- Maintaining and operating a gas monitoring system; and
- Maintaining run-on/run-off controls.

No wastes will remain exposed after closure of the landfill. Access to the closed site by the public will not pose a health hazard.

2.2 POST-CLOSURE CONTACT

All correspondence and questions concerning the post-closure care of the landfill should be directed to:

Davidson County Integrated Solid Waste Management Department
Attn: Charles Brushwood, Director
1242 Old Highway 29
Thomasville, NC 27360
Phone: (336) 242-2284
Fax: (336) 249-7524.

2.3 POST-CLOSURE USE

After filling operations cease at the landfill and the landfill is officially closed in accordance with the Closure Plan, each landfill unit will be maintained as a grassy hill. Davidson County will maintain control of the property and prevent public access to it during the post-closure period.

There may be (an) access road(s) on the final cover to allow proper maintenance during post-closure. Precise location of the access road(s) will be determined as a part of operations. Low ground pressure and rubber tire vehicles will be used for maintenance.

Davidson County may consider the possibility of the installation of one or more wind turbines on top of one or more closed landfill units. The County may install test devices (anemometers, etc.) on these units to evaluate this potential. Test devices are not expected to impact existing final

cover systems. An appropriate permit submittal will be made in the future should the County proceed with the installation of any temporary or permanent device which would impact the final cover system of any landfill unit.

2.4 MAINTENANCE

2.4.1 Repair of Security Control Devices

All security control devices will be inspected and maintained as necessary to ensure access to the site is controlled. Locks, vehicular gates, and fencing will be replaced if functioning improperly. Warning signs will be kept legible at all times and will be replaced if damaged by inclement weather or vandalism.

2.4.2 Erosion Damage Repair

If erosion of the final cover occurs during post-closure, the affected area will be repaired and reseeded as necessary. If necessary, rolled erosion control products (RECPs) will be used to expedite rapid revegetation of slopes and to secure topsoil in place.

2.4.3 Correction of Settlement, Subsidence, and Displacement

Minimum slopes of 5 percent will be maintained after settlement in order to prevent ponding and allow for proper drainage without infiltration. If vertical or horizontal displacement occurs due to differential settlement, cracks will be filled with appropriate material and final cover will be reestablished. Excessive vertical displacement is not anticipated.

2.4.4 Leachate Management System (Lined Units)

In order to maintain the free flow in leachate collection piping, they will be cleared of debris using the manholes or cleanout locations for access. If pipes should crush or buckle within the landfill, leachate will flow through the gravel columns. The leachate collection system (LCS) includes a continuous blanket drain on the base of the landfill which will allow drainage of leachate even in the very unlikely event of total failure of the leachate collection pipes.

2.4.5 Closure of Leachate Storage Lagoon and Tanks

After closure of the Phase 1 and Phase 2 MSW landfill units have been achieved, the generation of leachate will eventually curtail. The flow rate immediately after closure should decrease to approximately 100 gallons/acre/day. Toward the end of the 30-year post-closure period, the flow should approach zero, at which time the storage lagoon (Phase 1) or the storage tanks (Phase 2) will not be required. The following procedures will be followed to properly close the leachate storage lagoon and tanks:

- Completely drain and remove all liquids, sludges, sediments, etc. from the

storage lagoon or tanks.

- Disassemble the lagoon or tanks, piping, and appurtenances and dispose of the contents in a manner approved by the DWM.

- Sample and analyze the underlying soil for appropriate constituents inherent to leachate. Assess the results for evidence of contaminant migration.

- If contamination of underlying soils is exhibited, perform an assessment as to the degree of contamination and develop remedial actions.

- Obtain approval of the DWM for the assessment and associated remedial measures.

- Perform the remedial actions as necessary to limit any threats to public, health, and the environment.

- Restore the area(s) to closely match pre-existing conditions in the vicinity of the containment area(s). Activities may include: filling, grading, topsoiling, and seeding.

2.4.6 Repair of Run-On/Run-Off Control Structures

All drainage swales, ditches, and perimeter channels will be repaired, cleaned, or realigned in order to maintain their original condition. Any culverts that are damaged will be repaired or replaced.

2.4.7 Landfill Gas System

The landfill gas system will be maintained by the County and operated in accordance with any site air quality permits. Proper operation of the system is verified through testing at the landfill gas monitoring wells.

If gas wells/vents do not function as a result of irregular settlement, accumulation of liquids (condensate, leachate, water), binding or corrosion, additional and/or replacement wells/vents can be installed if necessary in accordance with the current Landfill Gas Management Plan.

2.4.8 Groundwater Monitoring Wells

Procedures outlined in the current Water Quality Monitoring Plan or subsequent revision will take precedence; however, a brief description follows. All groundwater monitoring wells have been installed with concrete pads and protective casings to prevent accidental damage by vehicles and equipment. The wells are also equipped with a locking cap to discourage vandalism. Groundwater wells will be inspected regularly (at the time of

sampling) to ensure integrity. Persons inspecting a well should look at the overall condition of the well, for signs of well tampering, and cracking or degradation of the concrete pad. Should a well require replacement, the defective well should be abandoned in accordance with specifications provided in the SAP and a new well installed at a location that is approved by the DWM.

2.5 MONITORING PLAN

The closed unit will be monitored for a minimum of 30 years. A series of inspections will be scheduled to ensure the integrity and effectiveness of the final cover system, surface water systems, groundwater monitoring system, landfill gas system, and to protect human health and the environment.

2.5.1 Inspection Frequencies

Inspections to be conducted during the post-closure care period will occur regularly as shown in **Table 2.1**.

2.5.2 Quarterly Inspections

Quarterly inspections of the closed site will be conducted by the County. These inspections will include examination of the security control devices for signs of deterioration or vandalism to ensure access to the site is limited to authorized persons. Each disposal area will be checked to ensure the integrity of the final cover system is maintained, erosion damage is repaired, vegetative cover persists, and that cover settlement, subsidence, and displacement are minimal. Drainage swales and channels will be cleared of litter and debris and benchmark integrity will be noted and maintained.

2.5.3 Semi-Annual Inspections

Semi-annual inspections of the site during the post-closure period will be conducted by the County with attention paid to integrity and drainage of the final cover system and condition of the groundwater and gas monitoring systems.

A report of findings will be made to the responsible party, including recommendations for actions deemed necessary to ensure the site continues to meet the closure performance standard.

2.6 ENGINEERING CERTIFICATION

Based on the County's monitoring reports, annual certifications by a registered engineer will be placed in the operating record. They will certify that the closure plan has been followed, noting discrepancies along with the corrective actions undertaken. At the end of the post closure period, the individual certifications will be compiled into a final document and forwarded to the DWM.

TABLE 2.1: POST-CLOSURE INSPECTION FREQUENCIES

INSPECTION ACTIVITY	YEAR 1	YEARS 2-30
Security Control Devices	Quarterly	Quarterly
Vegetative Cover Condition	Quarterly[1]	Quarterly
Surface Water Systems	Quarterly[1]	Quarterly
Erosion Damage	Quarterly[1]	Quarterly
Cover Drainage System	Quarterly[1]	Semi-Annually
Cover Settlement, Subsidence, and Displacement	Quarterly[1]	Semi-Annually
Leachate Management System	Quarterly	Semi-Annually
Landfill Gas System	Quarterly[2]	Semi-Annually[2]
Water Quality Monitoring	Semi-Annually[3]	Semi-Annually[3]
Landfill Gas Monitoring	Quarterly[4]	Quarterly[4]
Benchmark Integrity	Annually	Annually
Leachate Collection Pipe Inspection/Cleanout	See Note 5	

Notes:

1. These items will be inspected after each large storm event (i.e. ≥ 1 inch in any 24 hours).
2. Or in accordance with the current Landfill Gas Management Plan or air quality permit(s).
3. Or in accordance with groundwater monitoring schedule described in the current Water Quality Monitoring Plan.
4. Or in accordance with the current LFG Monitoring Plan.
5. Remote camera inspection and flushing (if necessary) of leachate collection piping (portion that can be inspected and cleaned) will be performed every 3 years. If piping is mostly clean at a 3-year interval, the County may petition the DWM to increase the inspection/cleaning frequency to a 5-year interval.

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SECTION 3.0
CLOSURE/POST-CLOSURE COST ANALYSIS

3.1 OVERVIEW

The purpose of this section is to provide a written estimate in current dollars of all costs associated with all activities specified in the written closure and post-closure plans which have been developed for the MSW (Phases 1 and 2) and the C&D (Phases 1 and 2) landfill units of the Davidson County Landfill.

3.2 ESTIMATED CLOSURE COSTS

Tables 3.1A, 3.1B, and 3.1C summarize the estimated costs for complete closure of the MSW Phase 1 (Areas 1 - 3), MSW Phase 2 (Area 1) and C&D (Phases 1-4) landfill units, respectively (the current maximum area to be closed). The cost estimate for each unit is based on a third party providing the necessary services and includes labor in the unit prices given. The estimated closure costs will be reviewed and updated as required to reflect adjustments for inflation, increased costs in construction or materials, or any other adjustments to the Closure Plan.

3.3 ESTIMATED POST-CLOSURE COSTS

Tables 3.2A, 3.2B, and 3.2C summarize the estimated costs for the post-closure care maintenance activities for the MSW Phase 1 (Areas 1 - 3), MSW Phase 2 (Area 1) and C&D (Phases 1-4) landfill units, respectively. The cost estimate for each unit is based on a third party providing the necessary services and includes labor in the unit prices given. The estimated post-closure costs will be reviewed and updated as required to reflect adjustments for inflation, rising costs of anticipated post-closure care, or any other adjustments to the Post-Closure Plan.

3.4 ESTIMATED ASSESSMENT AND CORRECTIVE ACTION COSTS

Table 3.3 summarizes the current potential assessment and corrective (remedial) action cost for the landfill facility. This cost is based on the required minimum amount ($3,000,000) per NCGS 130A 295.2(h) and includes amounts for water quality and landfill gas (LFG) monitoring and reporting (per NC DWM policy) plus contingency funds to cover potential future assessment and corrective action costs.

TABLE 3.1A: MSW - PHASE 1 - CLOSURE COST ESTIMATE[1]

ITEM	QUANTITY	UNITS	UNIT COST	ITEM COST (2011 $)
Surface Preparation	15.9	Acre	$10,000	$159,000
Landfill Gas System	15.9	Acre	$15,000	$238,500
30 mil Textured LLDPE Geomembrane	693,000	SF	$0.45	$311,850
Drainage Geocomposite	693,000	SF	$0.55	$381,150
Vegetative Soil Layer (24")	52,000	CY	$5.00	$260,000
Erosion Control (Rain Gutters, Diversion Berms, Down Pipes, Drainage Channels, Etc.)	15.9	Acre	$15,000	$238,500
Revegetation	15.9	Acre	$1,500	$23,850
Surveying	15.9	Acre	$2,000	$31,800
			Subtotal:	$1,644,650
Bonds, Mobilization, & Insurance			(4% of Subtotal):	$65,786
			Subtotal:	$1,710,436
			Contingency (10%):	$171,044
			Construction Subtotal:	**$1,881,480**
Engineering	15.9	Acre	$2,000	$31,800
CQA	15.9	Acre	$6,000	$95,400
			TOTAL:	**$2,008,680**

Notes:

1. Assumes closure of 15.9 acres (Phase 1 - Areas 1-3).

TABLE 3.1 B: MSW - PHASE 2 - CLOSURE COST ESTIMATE[1]

ITEM	QUANTITY	UNITS	UNIT COST	ITEM COST (2011 $)
Surface Preparation	14.7	Acre	$10,000	$147,000
Landfill Gas System	14.7	Acre	$15,000	$220,500
30 mil Textured LLDPE Geomembrane	641,000	SF	$0.45	$288,450
Drainage Geocomposite	641,000	SF	$0.55	$352,550
Vegetative Soil Layer (24")	48,000	CY	$5.00	$240,000
Erosion Control (Rain Gutters, Diversion Berms, Down Pipes, Drainage Channels, Etc.)	14.7	Acre	$15,000	$220,500
Revegetation	14.7	Acre	$1,500	$22,050
Surveying	14.7	Acre	$2,000	$29,400
			Subtotal:	$1,520,450
Bonds, Mobilization, & Insurance			(4% of Subtotal):	$60,818
			Subtotal:	$1,581,268
			Contingency (10%):	$158,127
			Construction Subtotal:	**$1,739,395**
Engineering	14.7	Acre	$2,000	$29,400
CQA	14.7	Acre	$6,000	$88,200
			TOTAL:	**$1,856,995**

Notes:

1. Assumes closure of 14.7 acres (Phase 2 - Area 1).

TABLE 3.1C: C&D UNIT - CLOSURE COST ESTIMATE[1]

ITEM	QUANTITY	UNITS	UNIT COST	ITEM COST (2011 $)
Surface Preparation	7.6	Acre	$2,000	$15,200
Landfill Gas System	7.6	Acre	$3,000	$22,800
Compacted Soil Barrier (18")	18,400	CY	$7.00	$128,800
Vegetative Soil Layer (18")	18,400	CY	$4.00	$73,600
Erosion Control (Diversion Berms, Down Pipes, Drainage Channels, Etc.)	7.6	Acre	$5,000	$38,000
Revegetation	7.6	Acre	$1,500	$11,400
Surveying	7.6	Acre	$2,000	$15,200
			Subtotal:	$305,000
Bonds, Mobilization, & Insurance			(4% of Subtotal):	$12,200
			Subtotal:	$317,200
			Contingency (10%):	$31,720
			Construction Subtotal:	**$348,920**
Engineering	7.6	Acre	$2,000	$15,200
CQA	7.6	Acre	$6,000	$45,600
			TOTAL:	**$409,720**

Notes:

1. Assumes closure of 7.6 acres (Phases 1 - 4).

TABLE 3.2A: MSW - PHASE 1 - POST-CLOSURE COST ESTIMATE[1]

ITEM	QUANTITY	UNIT	UNIT COST	TOTAL (2011 $)
Site Inspection And Record Keeping	60	HR	$75	$4,500
Revegetation (5% Total Area)	2	Acre	$1,500	$3,000
Mowing (once per year)	32	Acre	$100	$3,200
Erosion Control	1	LS	$5,000	$5,000
Gates/Fences/Access	1	LS	$2,000	$2,000
Leachate Management[2]	1	LS	$43,287	$43,287
			Subtotal:	$60,987
			Contingency (10%):	$6,099
			ANNUAL TOTAL:	**$67,086**
			30-YEAR TOTAL:	**$2,012,580**

Notes:

1. Assumes post-closure of MSW Phase 1 (Areas 1 - 3) (31.9 Ac.).
2. Leachate treatment based on 100 gal/ac/day x 31.9 acres lined x 365 x $20/1,000 gal. ($23,287/year) plus $5,000/year staff cost plus $3,000/year lab cost plus $2,000/year leachate collection line cleanout costs. Also include $10,000 per year to account for decommissioning leachate facilities (leachate storage lagoon) ($300,000 assumed) at the end of the post-closure period.

TABLE 3.2B: MSW - PHASE 2 - POST-CLOSURE COST ESTIMATE[1]

ITEM	QUANTITY	UNIT	UNIT COST	TOTAL (2011 $)
Site Inspection And Record Keeping	60	HR	$75	$4,500
Revegetation (5% Total Area)	1	Acre	$1,500	$1,500
Mowing (once per year)	15	Acre	$100	$1,500
Erosion Control	1	LS	$5,000	$5,000
Gates/Fences/Access	1	LS	$2,000	$2,000
Leachate Management[2]	1	LS	$30,731	$30,731
			Subtotal:	$45,231
			Contingency (10%):	$4,523
			ANNUAL TOTAL:	**$49,754**
			30-YEAR TOTAL:	**$1,492,620**

Notes:

1. Assumes post-closure of MSW Phase 2 (Area 1) (14.7 Ac.)
2. Leachate treatment based on 100 gal/ac/day x 14.7 acres lined x 365 x $20/1,000 gal. ($10,731/year) plus $5,000/year staff cost plus $3,000/year lab cost plus $2,000/year leachate collection line cleanout costs. Also include $10,000 per year to account for decommissioning leachate facilities (leachate storage lagoon) ($300,000 assumed) at the end of the post-closure period.

TABLE 3.2C: C&D UNIT - POST-CLOSURE COST ESTIMATE[1]

ITEM	QUANTITY	UNIT	UNIT COST	TOTAL (2011 $)
Site Inspection And Record Keeping	20	HR	$75	$1,500
Revegetation (5% Total Area)	0.4	Acre	$1,500	$600
Mowing (once per year)	8	Acre	$100	$800
Erosion Control	1	LS	$2,000	$2,000
Gates/Fences/Access	1	LS	$1,000	$1,000
			Subtotal:	$5,900
			Contingency (10%):	$590
			ANNUAL TOTAL:	**$6,490**
			30-YEAR TOTAL:	**$194,700**

Notes:

1. Assumes post-closure of C&D Phases 1- 4 (7.6Ac.).

TABLE 3.3: ASSESSMENT & CORRECTIVE ACTION COST ESTIMATE[1]

ITEM	ANNUAL COST	30-YEAR TOTAL (2011 $)
MSW - Phase 1 Unit (See Notes 2 and 5):		
Water Quality Monitoring & Reporting	$30,000	$900,000
LFG Monitoring & Reporting	$ 6,000	$180,000
MSW - Phase 2 Unit (See Notes 3 and 5):		
Water Quality Monitoring & Reporting	$30,000	$900,000
LFG Monitoring & Reporting	$ 6,000	$180,000
C&D Unit (See Notes 4 and 5):		
Water Quality Monitoring & Reporting	$10,000	$300,000
LFG Monitoring & Reporting	$ 4,000	$120,000
	Subtotal:	$2,580,000
	Contingency:	$ 420,000
	TOTAL:	**$3,000,000**

Notes:

1. Per NCGS 130A 295.2(h).
2. The water quality monitoring and reporting cost for the Phase 1 MSW landfill unit assumes 15 long-term wells/points sampled semi-annually @ $15,000 per event (annual cost = $30,000).
3. The water quality monitoring and reporting cost for the Phase 2 MSW landfill unit assumes 15 long-term wells/points sampled semi-annually @ $15,000 per event (annual cost = $30,000).
4. The water quality monitoring and reporting cost for the C&D landfill unit assumes 5 long-term wells/points sampled semi-annually @ $5,000 per event (annual cost = $10,000).
5. The LFG monitoring and reporting costs assume quarterly monitoring for each unit at a cost of: $1,500/event (Phase 1 MSW) (annual cost = $6,000); $1,500/event (Phase 2 MSW) (annual cost = $6,000); and $1,000/event (C&D) (annual cost = $4,000).