

Scanned By	Date	DOC ID	Permit
Backus	09/23/2014	21827	9231-CDLF-2012

September 22, 2014

Patricia Backus, P.E.  
Environmental Engineer II  
North Carolina Department of Environment and Natural Resources  
Waste Management Division - Solid Waste Section Permitting Branch  
1646 Mail Service Center  
Raleigh, NC 27699-1646

**RE: Brownfield Road C&D Landfill (State Permit No. 92-31)  
Closure, Post-Closure, and Assessment/Corrective Action Cost Estimates**

Dear Ms. Backus:

On behalf of Wake Reclamation, LLC, Smith Gardner, Inc. (S+G) is pleased to submit the cost estimates related to closure, post-closure, and potential assessment & corrective action costs for the Brownfield Road C&D Landfill. The following are the estimated closure, post-closure, and assessment/corrective action costs as of the date of this letter:

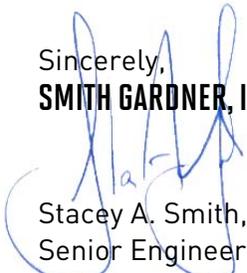
Phase 1 – Phase 2A Cell 2 Closure Cost (29.2 acres):	\$1,450,910
Phase 1 – Phase 2A Cell 2 Post-Closure Cost (30-Yr) (29.2 acres):	\$1,086,360
Potential Assessment and Corrective Action Cost (SB 734):	\$1,000,000
<b>Total:</b>	<b>\$3,537,270</b>

Please find **attached** a detailed breakdown of closure, post-closure, and assessment and corrective action costs.

S+G has performed these types of estimates for a number of our clients and through our extensive work in the solid waste industry we maintain an up to date understanding of construction, maintenance, and monitoring costs related to landfills.

Please contact me at your earliest convenience if you have any questions or comments on this matter.

Sincerely,  
**SMITH GARDNER, INC.**

  
Stacey A. Smith, P.E.  
Senior Engineer

[stacey@smithgardnerinc.com](mailto:stacey@smithgardnerinc.com)

Attachments: Closure and Post-Closure Cost Estimates

cc: David Pepper, Waste Industries USA, Inc.  
Donald Plessinger, Waste Industries USA, Inc  
File

Brownfield Road C&D Landfill (NC Solid Waste Permit No. 92-31)  
Engineer's Closure Construction Cost Estimate

Item No.	Item Description	Unit	Contractor			Comments
			Quantity	Unit Price	Total Price	
Closure Area (Horizontal Plan) ---->						
		AC	29.2			
1.0	Pre-Construction			Subtotal	\$24,600.00	
1.1	Construction Documents & Bidding	AC	29	\$10k + \$500/AC	\$24,600.00	S+G Estimate
2.0	Construction				\$1,213,990.00	Reference 1
2.1	Surveys and Layout	AC	29	\$250.00	\$7,300.00	S+G Historical Estimate
2.2	Mobilization	AC	29	\$1,600.00	\$46,720.00	-4% of Construction Cost
2.3	Site Preparation (repairs to intermediate cover layer)	AC	29	\$1,000.00	\$29,200.00	Assumed estimate for repair of erosion rills.
2.4	18" On-site Low Permeability Soil	CY	70,664	\$8.00	\$565,312.00	S+G Historical Estimate
2.5	18" Vegetative Support Layer	CY	70,664	\$3.25	\$229,658.00	S+G Historical Estimate
2.6	Landfill Gas Venting System	AC	29	\$1,200.00	\$35,040.00	S+G Historical Estimate
2.7	Cap Drainage Structures (berms, piping, etc.)	AC	29	\$7,500.00	\$219,000.00	S+G Historical Estimate
2.8	Erosion & Sediment Control (grading, silt fence, maintenance, etc.)	AC	29	\$800.00	\$23,360.00	S+G Historical Estimate
2.9	Revegetation	AC	29	\$2,000.00	\$58,400.00	S+G Historical Estimate
3.0	Quality Assurance, Certification, & Deed Notation				\$175,820.00	
3.1	Field Monitoring	AC	29	\$3,000.00	\$87,600.00	S+G Estimate
3.2	Laboratory Testing	AC	29	\$2,500.00	\$73,000.00	S+G Estimate
3.3	Engineering Certification	AC	29	\$5k + \$250/AC	\$12,300.00	S+G Estimate
3.4	Surveying and Deed Notation	AC	29	\$100.00	\$2,920.00	S+G Historical Estimate
4.0	Miscellaneous Costs to Close				\$36,500.00	
4.1	Erosion and Stormwater Control (outside landfill footprint)	AC	29	\$1,000.00	\$29,200.00	S+G Historical Estimate
4.2	Engineering and Reporting	AC	29	\$250.00	\$7,300.00	S+G Historical Estimate
5.0	Total Closure Costs					
	Construction Estimate ---->				\$1,450,910	(2014\$)
	Cost per Acre ---->				\$49,688.70	
	Total Estimate ---->				\$1,450,910	(2014\$) (See Notes 1 & 2)

Notes:

- All costs are presented in current dollars and should be increased at an inflation rate prescribed by the NCDENR Division of Waste Management per <http://portal.ncdenr.org/web/wm/sw/financialassurance> if additional review is not performed annually.
- This ESTIMATE has been prepared for financial assurance purposes only and shall not be considered a replacement for an actual bid from a licensed contractor and is considered acceptable within a +/- 10% of the Total Estimate value.

References:

- Material Recovery, LLC, Brownfield Road C&D Landfill, Phase 2 Permit Modifications, June 2008, Revised and Updated June 2010, prepared by David Garrett & Associates, Inc.

Denotes values calculated in spreadsheet.

Brownfield Road C&D Landfill (NC Solid Waste Permit No. 92-31)  
Engineer's Post Closure Cost Estimate

Item	Quantity	Unit	Comments
<b>Groundwater Monitoring</b>			
Monitoring wells	12	wells	Reference 1
Surface water point	3	points	Reference 1
Sampling frequency	2	events	Reference 1
Field sampling, collection, and shipping	\$800	per event	S+G estimate
Laboratory Analysis	\$325	per well	S+G estimate
Data review, statistics, and reporting	\$2,000	per event	S+G estimate
Maintenance and repair	\$100	per well	S+G estimate
Subtotal Cost	\$16,550	per year	Compares to current pricing by Golder
<b>Landfill Gas Management</b>			
Control System Vents	15	vents	Pro-rated @ one (1) per two (2) acres
Sub-Surface Perimeter Monitoring Probes	10	probes	Per Ref. 1
Control system monitoring, maintenance and repair	\$50	per vent per year	S+G estimate
Semi-Annual Perimeter Monitoring	\$100	per probe per year	S+G estimate
Subtotal Cost	\$1,730	per year	Averaged over post-closure period
<b>Final Cover Management</b>			
Area of maintenance	292	acres	Extends to area immediately around landfill
Mowing	\$100	per acre	S+G estimate
Erosion and sediment control maintenance	\$200	per acre	S+G estimate
Topdressing (seed & fertilizer)	\$150	per acre	S+G estimate
Vector and rodent control	\$10	per acre	S+G estimate
Maintenance Mobilization	\$1,000	per year	S+G estimate
Subtotal Cost	\$14,432	per year	
<b>Administration, Inspections, and Reporting</b>			
Administration and record keeping	\$1,000	per year	S+G estimate
Inspection	\$1,000	per year	S+G estimate
Miscellaneous engineering	\$1,500	per year	S+G estimate
Subtotal Cost	\$3,500	per year	
<b>Subtotal Post-Closure Costs</b>			
Estimated Average Annual Costs	\$36,212	per year (2014\$)	
Number of Years for Post-Closure	30	years	
Cost per Acre	\$1,240.14	per year	
Subtotal Post Closure Costs	\$1,086,360	(2014\$) (See Notes 1 & 2)	
<b>Potential Assessment and Corrective (Remedial) Action</b>			
Minimum amount required by NCDENR Division of Waste Management	\$1,000,000	lump sum	Regulatory requirement (SB 734)
Total Post Closure and Remedial Costs	\$2,086,360	(2014\$) (See Notes 1 & 2)	
Total Closure, Post Closure and Remedial Costs	\$3,537,270	(2014\$) (See Notes 1 & 2)	

Notes:

- All costs are presented in current dollars and should be increased at an inflation rate prescribed by the NCDENR Division of Waste Management per <http://portal.ncdenr.org/web/wm/sw/financialassurance> if additional review is not performed annually.
- This ESTIMATE has been prepared for financial assurance purposes only and shall not be considered a replacement for an actual bid from a licensed contractor and is considered acceptable within a +/- 10% of the Total Estimate value.

References:

- Material Recovery, LLC, Brownfield Road C&D Landfill, Phase 2 Permit Modifications, June 2008, Revised and Updated June 2010, prepared by David Garrett & Associates, Inc.

Denotes values calculated in spreadsheet.