



July 24, 2019

Lincoln County Landfill
5291 Crouse Road
Crouse, North Carolina 28033

Attention: Mr. Mark Bivins
Solid Waste Manager

Reference: Financial Assurance Estimate of Probable Cost (2019)
Lincoln County Landfill
S&ME Project No: 7335-19-051
NC Engineering License No. F-0176

Dear Mr. Bivins:

S&ME, Inc. (S&ME) has prepared an estimate for financial assurance for the Lincoln County Landfill in Crouse, North Carolina for the year 2019. This work was conducted in general accordance with the scope of work provided in our June 5, 2019 proposal (S&ME proposal number 73-1900062).

1.1 BACKGROUND

North Carolina Solid Waste Management Rules identified under 15A NCAC 13B (commonly referred to as the .1600 rules) outline requirements for financial assurance under Rule .1628. These rules require that landfill owners and operators submit detailed cost estimates for closure and post-closure care. These rules specifically require that the estimate be provided in current dollars for the cost of hiring a third party to close the largest area open at any time during the C&D and MSW landfill active life. These rules also require that the estimate be provided for care of the facility over a thirty-year post-closure period. In addition, the North Carolina Department of Environmental Quality (NCDEQ) requires that an estimate be provided for financial assurance sufficient to cover potential assessment and corrective action for municipal solid waste (MSW) landfills.

1.2 FINANCIAL ASSURANCE

S&ME prepared this estimate of probable cost for closure, post-closure care, and corrective action. We based this estimate on the 2018 estimate with appropriate changes to market values anticipated at the time of this report based on our recent experience with landfill construction and maintenance projects, and our understanding of the rules and requirements in effect.

MSW Landfill

The estimate of probable cost for closure and post-closure care for the MSW landfill is summarized in Table 1 attached. All Tables are located in Appendix I. The detailed estimate of probable closure cost is summarized in Table 2. The detailed estimate of post-closure care is summarized in Table 3.



The estimate is based on the following assumptions:

- the current MSW landfill footprint that would require closure consists of Phases I, II, III, and IV;
- the Phase I through IV area requiring closure is 40 acres;
- the cover system will consist of from top to bottom:
 - a 6-inch thick vegetative layer;
 - a 18-inch thick earthen barrier layer;
 - a geocomposite drainage layer;
 - a 40 mil thick linear low density polyethylene (LLDPE) geomembrane;
 - a geosynthetic clay liner (GCL); and
 - a 12-inch thick interim cover soil/cover foundation layer.
- an active gas collection and control system will be installed;
- a 30-year post closure maintenance period; and
- quarterly observations and an annual certification by a registered professional engineer during the post-closure care period.

Post closure groundwater monitoring is incorporated into the cost for corrective action provided below.

C&D Landfill

The estimate of probable cost for closure and post-closure care for the C&D landfill is summarized in Table 4 attached. The detailed estimate of probable closure cost is summarized in Table 5. The detailed estimate of post-closure care is summarized in Table 6.

The estimate is based on the following assumptions:

- the Phase II area requiring closure is 7.5 acres;
- the cover system will consist of from top to bottom:
 - a 18-inch thick erosion layer; and
 - a 18-inch thick low-permeability barrier;
- a passive gas venting system will be installed;
- a 30-year post closure maintenance period; and
- quarterly observations and an annual certification by a registered professional engineer during the post-closure care period.

Corrective Action

The estimate of probable cost for potential assessment and corrective action is summarized in Table 7 attached. The detailed estimate for potential assessment and corrective action is summarized in Table 8.

The estimate was prepared using an assumed scenario of a release at the Municipal Solid Waste (MSW) landfill. The selected remedy assumed was natural attenuation with a monitoring period of 30 years. The cost estimate has been separated into fifteen tasks that correspond with the "Draft Financial Assurance Cost Estimate Summary for Potential Assessment and Corrective Action for Municipal Solid Waste Landfills" list of rule based items. Assumptions made as to the number of wells installed and sampled are included in the cost estimate under the respective task.



1.3 REVISIONS FROM PRIOR ESTIMATE

S&ME has revised the estimate of probable cost since the prior estimate provided to Lincoln County in 2018. Based on our experience since the 2018 estimate, we have made revisions that in our opinion are more representative of existing conditions, the current market price, and NCDEQ expectations.

1.4 CLOSURE

S&ME appreciates the continued opportunity to be of service to Lincoln County. Please contact us at your convenience should you have questions or comments.

Sincerely,

S&ME, Inc.

A handwritten signature in blue ink that reads "Jasmine Tayouga".

Jasmine Tayouga
Associate Project Manager

A handwritten signature in blue ink that reads "Christopher J.L. Stahl".

Christopher J.L. Stahl, P.E.
Principal Engineer/Area Manager II

Attachments
Tables 1 - 8

Attachments

Attachment I – Tables 1 - 8

TABLE 1 - Estimate of Probable Cost Summary (2019 Dollars)

Final Closure/ Post Closure/Corrective Action

Lincoln County MSW Landfill Phases I, II, III, and IV

S&ME Project No. 7335-19-051

ACTION	COST ESTIMATE
FINAL CLOSURE	\$7,328,000
POST-CLOSURE	\$3,131,000

TOTAL (2019 DOLLARS) \$10,459,000

TABLE 2 - Final Closure Estimate of Probable Cost

Lincoln County MSW Landfill Phases I, II, III, and IV

S&ME Project No. 7335-19-051

Total Area (Phase I, II, III, and IV)	40 Acres	1,742,400 SF
Area to be Capped (Phase I, II, III, and IV)	40 Acres	1,742,400 SF

Item	Quantity	Unit	Cost/Unit	Total Cost
Final Cover System				
Vegetative Layer (6 inch thick)	32,267	CY	\$ 9.00	\$ 290,403
Earthen Barrier Layer (18 inch thick)	96,800	CY	\$ 6.50	\$ 629,200
Geosynthetic Clay Liner	1,742,400	SF	\$ 0.65	\$ 1,132,560
Geocomposite Drainage Layer	1,742,400	SF	\$ 0.70	\$ 1,219,680
Geomembrane (Textured 40-Mil LLDPE)	1,742,400	SF	\$ 0.60	\$ 1,045,440
				\$4,317,283

Sedimentation and Erosion Control Devices				
Grass Lined Ditches	14,573	LF	\$ 6.00	\$ 87,438
Down-Piping	1,887	LF	\$ 65.00	\$ 122,655
Silt Fence	1,600	LF	\$ 3.50	\$ 5,600
Outlet Protection Aprons	4	EA	\$ 3,500.00	\$ 14,000
Drop Inlets	14	EA	\$ 5,500.00	\$ 77,000
				\$ 306,693

Gas Controls - Active Gas Venting System				
Methane Enclosed Flare System	1	EA	\$ 162,250.00	\$ 162,250
Methane Blower Building and Controls	1	EA	\$ 108,000.00	\$ 108,000
Methane Pipe Network, Valves, Condensate Sump, Wells Installed	40	Acres	\$ 21,700.00	\$ 868,000
				\$1,138,250

Final Landscaping				
Seeding / Fertilizing / Mulching	40	Acres	\$ 2,500.00	\$ 100,000
				\$ 100,000

SUBTOTAL (2019 DOLLARS) \$5,862,226

Contractor Mobilization/Demobilization (5% of Subtotal)	1	LS		\$ 293,111
				\$ 293,111

Engineering - Permitting, Design & Construction CQA (10% of Subtotal)	1	LS		\$ 586,223
				\$ 586,223

Contingency (10% of Subtotal)	1	LS		\$ 586,223
				\$ 586,223

TOTAL COST (2019 DOLLARS) \$7,327,783

TABLE 3 - Post-Closure Estimate of Probable Cost

Lincoln County MSW Landfill Phases I, II, and III

S&ME Project No. 7335-19-051

Total Area (Phase I, II, III, IV)	40 Acres	1,742,400 SF
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Item	Quantity	Unit	Cost/Unit	Total Cost
Leachate Collection & Treatment	29,180	GAL	\$ 0.026	\$ 759
				\$ 759

Maintenance (Preventative & Corrective)				
Leachate Collection Removal and Treatment Systems - Annual Cleaning	1	LS	\$ 4,100.00	\$ 4,100
Operate Gas Removal System	1	LS	\$ 3,100.00	\$ 3,100
Wells (Methane & Groundwater)	1	LS	\$ 510.00	\$ 510
Final Cover Maintenance	40	Acre	\$ 1,550.00	\$ 62,000
Miscellaneous (Fencing, Gates, Signs, Roads, Storm Water Structures)	1	LS	\$ 2,000.00	\$ 2,000
				\$ 71,710

Permit Fees	1	LS	\$ 2,500.000	\$ 2,500
				\$ 2,500

Administration / Inspections / Record Keeping				
Project Engineer Labor	96	HRS	\$ 130.00	\$ 12,480
Technician Labor	64	HRS	\$ 75.00	\$ 4,800
Clerical Labor	48	HRS	\$ 44.00	\$ 2,112
				\$ 19,392

ANNUAL COST (2019 DOLLARS) \$ 94,361

Leachate and Gas Collection System Abandonment (One Time Cost)				
Abandon LCS Tanks	1	LS	\$ 150,000.00	\$ 150,000
Abandon Gas Collection Control System	1	LS	\$ 150,000.00	\$ 150,000
				\$ 300,000

TOTAL COST - 30 YEARS (2019 DOLLARS) \$ 3,130,820

TABLE 4 - Estimate of Probable Cost Summary (2019 Dollars)

Final Closure/ Post Closure

Lincoln County C&D Landfill Phase II

S&ME Project No. 7335-19-051

ACTION	COST ESTIMATE
FINAL CLOSURE	\$672,000
POST-CLOSURE	\$920,000

TOTAL (2019 DOLLARS) \$1,592,000

TABLE 5 - Final Closure Estimate of Probable Cost

Lincoln County C&D Landfill Phase II

S&ME Project No. 7335-19-051

Total Area (Phase II)	7.5 Acres	326,700 SF
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Item	Quantity	Unit	Cost/Unit	Total Cost
Final Cover System				
Excavating & Screening On-Site Material (Low Permeability Only)	18,150	CY	\$ 4.40	\$ 79,860.00
Borrow Area Clearing & Grubbing	1.15	Acres	\$ 2,793.00	\$ 3,211.95
Borrow Area Silt Fence	500	LF	\$ 3.50	\$ 1,750.00
18" Low Permeability Layer	18,150	CY	\$ 6.50	\$ 117,975.00
18" Erosion Layer	18,150	CY	\$ 7.50	\$ 136,125.00
Access Road	5,914	Sq. Yd	\$ 23.00	\$ 136,022.00
Gas Vent Materials (HDPE Pipe, 57 Stone, Geotextile, GCDL)	8	Pcs	\$ 1,565.00	\$ 12,520.00
Gas Vent Installation	8	Pcs	\$ 809.00	\$ 6,472.00
Surveying	1	LS	\$ 4,000.00	\$ 4,000.00
				\$ 497,935.95

Sediment & Erosion Control Measures				
Silt Fence	1,470	LF	\$ 3.50	\$ 5,145.00
Drop Inlet Catch Basin (2.5' x 2.5' x 2.0')	4	Pcs	\$ 5,500.00	\$ 22,000.00
12" Smooth-Lined Corrugated HDPE Pipe	174	LF	\$ 38.00	\$ 6,612.00
15" Smooth-Lined Corrugated HDPE Pipe	227	LF	\$ 45.00	\$ 10,215.00
18" Smooth-Lined Corrugated HDPE Pipe	220	LF	\$ 50.00	\$ 11,000.00
21" Smooth-Lined Corrugated HDPE Pipe	160	LF	\$ 59.00	\$ 9,440.00
Rip-Rap & Geotextile (Outlet Protection)	1	LS	\$ 2,500.00	\$ 2,500.00
				\$ 66,912.00

Final Landscaping				
Seeding/Fertilizing/Mulching	7.5	Acres	\$ 2,500.00	\$ 18,750.00
				\$ 18,750.00

SUBTOTAL (2019 DOLLARS) \$ 583,598

Contractor Mobilization/Demobilization (5% of Subtotal)				
Contractor Mobilization/Demobilization	1	LS	-	\$ 29,179.90
				\$ 29,179.90

Engineering - Permitting, Design & Construction CQA (10% of Subtotal)				
	1	LS	-	\$ 58,359.80
				\$ 58,359.80

Administration				
Announcements/Deeds/Fees	1	LS	\$ 1,100.00	\$ 1,100.00
				\$ 1,100.00

Total Cost (2019 Dollars): \$ 672,238

TABLE 6 - Post-Closure Care Estimate of Probable Cost

Lincoln County C&D Landfill Phase II

S&ME Project No. 7335-19-051

Total Area (Phase II)	7.5 Acres	326,700 SF
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Item	Quantity	Unit	Cost/Unit	Total Cost
Monitoring/Reporting				
Groundwater Monitoring (4 wells semi-annually)	8	Sample	\$ 280.00	\$ 2,240.00
Semi-Annual Reporting (Groundwater Reports)	2	Event	\$ 2,200.00	\$ 4,400.00
				\$ 6,640.00
Maintenance (Preventive & Corrective)				
Wells (4 Groundwater Wells)	4	Well	\$ 510.00	\$ 2,040.00
Final Cover Maintenance	7.5	Acre	\$ 1,550.00	\$ 11,625.00
				\$ 13,665.00
Administration				
Annual Certification	1	LS	\$ 5,200.00	\$ 5,200.00
Monthly Administration	12	LS	\$ 430.00	\$ 5,160.00
				\$ 10,360.00

Total Annual Cost (2019 Dollars): \$ 30,665

Total Cost Over 30 years (2019 Dollars): \$ 919,950

TABLE 7**Corrective Action Estimate of Probable Cost Summary (2019 Dollars)**

Lincoln County Landfill

S&ME Project No. 7335-19-051

Assumed Scenario: Release at MSW Landfill, Monitored Natural Attenuation as Selected Remedy.

TASK	RULE	DESCRIPTION	ESTIMATED COST
TASK 1	15A NCAC 13B .1634	Appendix II Background Sampling of Groundwater Monitoring Network (4 events per sampling location)	\$ 83,530.00
TASK 2	15A NCAC 13B .1634	Installation of at least two wells (deep and shallow) at the compliance boundary	\$ 20,980.00
TASK 3	15A NCAC 13B .1634	Appendix II Sampling of Original Well Network and Compliance Boundary Wells Annually (First Semi-Annual Monitoring Event)	\$ 28,040.00
TASK 4	15A NCAC 13B .1634	Appendix I and II Detects Sampling of Original Well Network and Compliance Boundary Wells Annually (Second Semi-Annual Monitoring Event)	\$ 21,970.00
TASK 5	15A NCAC 13B .1634	Installation of additional monitoring wells to characterize the nature and extent (N&E) of the plume	\$ 65,010.00
TASK 6	15A NCAC 13B .1634	Appendix II Background Sampling of N&E Monitoring Network (4 events per sampling location)	\$ 48,950.00
TASK 7	15A NCAC 13B .1634	Appendix II Sampling of N&E Well Network Annually (First Semi-Annual Monitoring Event)	\$ 17,000.00
TASK 8	15A NCAC 13B .1634	Appendix I and II Detects Sampling of N&E Well Network Annually (Second Semi-Annual Monitoring Event)	\$ 14,460.00
TASK 9	15A NCAC 13B .1635	Assessment of Corrective Measures (Report, Public Notice, Public Meeting)	\$ 43,520.00
TASK 10	15A NCAC 13B .1636	Selection of Remedy	\$ 21,200.00
TASK 11	15A NCAC 13B .1636 and .1637	Corrective Action Plan Submittal, Approval, and Implementation	\$ 1,624,220.00
TASK 12	15A NCAC 13B .1636 and .1637	Installation of Additional Monitoring Wells to Monitor Effectiveness of Selected Remedy	\$ 41,160.00
TASK 13	15A NCAC 13B .1636 and .1637	Maintenance and Repair of Additional Monitoring Wells	\$ 7,500.00
TASK 14	15A NCAC 13B .1636 and .1637	Sampling and Analysis of Additional Monitoring Wells	\$ -
TASK 15	15A NCAC 13B .1637	Corrective Action Remedy is Complete	\$ 12,850.00

ESTIMATE OF PROBABLE COST FOR CORRECTIVE ACTION	\$ 2,050,390
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TABLE 8

Corrective Action Estimate of Probable Cost (2019 Dollars)

Lincoln County Landfill

S&ME Project No. 7335-19-051

Assumed Scenario: Release at MSW Landfill, Monitored Natural Attenuation as Selected Remedy.

TASK 1									
15A NCAC 13B .1634									
Appendix II Background Sampling of Groundwater Monitoring Network									
(4 events per sampling location)									
20 MSW Well Locations, 3 Days to Sample									
Field Work (4 events)									
Technician Time (2 techs)	240	hours	at	\$	75.00	per	hour	\$	18,000.00
Mileage	1,200	miles	at	\$	0.58	per	mile	\$	696.00
Water Level Probe	12	days	at	\$	30.00	per	day	\$	360.00
pH/Temperature/Conductivity Meter	12	days	at	\$	40.00	per	day	\$	480.00
Gator Rental	12	days	at	\$	140.00	per	day	\$	1,680.00
Disposable Teflon Bailers	7	cases	at	\$	250.00	per	case	\$	1,750.00
Disposables (Tubing, Gloves, Ropes etc)	1	each	at	\$	600.00	per	each	\$	600.00
								\$	23,566.00
Analytical (4 events)									
Appendix II - Volatiles	84	each	at	\$	82.80	per	each	\$	6,955.20
Appendix II - Semi Volatiles	80	each	at	\$	195.50	per	each	\$	15,640.00
Appendix II - Pesticides/PCB	80	each	at	\$	103.50	per	each	\$	8,280.00
Appendix II - Herbicides	80	each	at	\$	115.00	per	each	\$	9,200.00
Appendix II - Metals	80	each	at	\$	103.50	per	each	\$	8,280.00
Appendix II - CN	80	each	at	\$	40.25	per	each	\$	3,220.00
Appendix II - Sulfide	80	each	at	\$	17.25	per	each	\$	1,380.00
								\$	52,955.20
Reporting (1 event)									
Senior Professional (P5)	2	hour	at	\$	165.00	per	hour	\$	330.00
Registered Professional (P4)	8	hours	at	\$	132.00	per	hour	\$	1,056.00
Project Professional (P3)	40	hours	at	\$	115.00	per	hour	\$	4,600.00
CAD Operator	8	hours	at	\$	95.00	per	hour	\$	760.00
Administration	4	hours	at	\$	65.00	per	hour	\$	260.00
								\$	7,006.00
TASK 1 TOTAL								\$	83,527

Corrective Action Estimate of Probable Cost (2019 Dollars)

S&ME Project No. 7335-19-051

Well Survey									
Project Professional (P3)	2	hours	at	\$	115.00	per	hour	\$	230.00
Subcontracted Survey Cost	1	each	at	\$	2,000.00	per	each	\$	2,000.00
								\$	2,230.00
Boring Logs, Well Logs, and Estimation of Groundwater Flow									
Registered Professional (P4)	4	hours	at	\$	132.00	per	hour	\$	528.00
Project Professional (P3)	24	hours	at	\$	115.00	per	hour	\$	2,760.00
CAD Operator	8	hours	at	\$	95.00	per	hour	\$	760.00
Administration	4	hours	at	\$	65.00	per	hour	\$	260.00
								\$	4,308.00
TASK 2 TOTAL								\$	20,975

TABLE 8**Corrective Action Estimate of Probable Cost (2019 Dollars)**

Lincoln County Landfill

S&ME Project No. 7335-19-051

Assumed Scenario: Release at MSW Landfill, Monitored Natural Attenuation as Selected Remedy.

TASK 3**15A NCAC 13B .1634****Appendix II Sampling of Original Well Network and Compliance Boundary Wells Annually****(First Semi-Annual Monitoring Event)****22 MSW Well Locations, 3 Days to Sample****Field Work (1 event)**

Technician Time (2 techs)	60	hours	at	\$	75.00	per	hour	\$	4,500.00
Mileage	300	miles	at	\$	0.58	per	mile	\$	174.00
Water Level Probe	3	days	at	\$	30.00	per	day	\$	90.00
pH/Temperature/Conductivity Meter	3	days	at	\$	40.00	per	day	\$	120.00
Gator Rental	3	days	at	\$	140.00	per	day	\$	420.00
Disposable Teflon Bailers	2	cases	at	\$	250.00	per	case	\$	500.00
Disposables (Tubing, Gloves, Ropes etc)	1	each	at	\$	150.00	per	each	\$	150.00
									\$ 5,954.00

Analytical (1 event)

Appendix II - Volatiles	23	each	at	\$	82.80	per	each	\$	1,904.40
Appendix II - Semi Volatiles	22	each	at	\$	195.50	per	each	\$	4,301.00
Appendix II - Pesticides/PCB	22	each	at	\$	103.50	per	each	\$	2,277.00
Appendix II - Herbicides	22	each	at	\$	115.00	per	each	\$	2,530.00
Appendix II - Metals	22	each	at	\$	103.50	per	each	\$	2,277.00
Appendix II - CN	22	each	at	\$	40.25	per	each	\$	885.50
Appendix II - Sulfide	22	each	at	\$	17.25	per	each	\$	379.50
									\$ 14,554.40

Reporting (1 event)

Senior Professional (P5)	2	hour	at	\$	165.00	per	hour	\$	330.00
Registered Professional (P4)	12	hours	at	\$	132.00	per	hour	\$	1,584.00
Project Professional (P3)	40	hours	at	\$	115.00	per	hour	\$	4,600.00
CAD Operator	8	hours	at	\$	95.00	per	hour	\$	760.00
Administration	4	hours	at	\$	65.00	per	hour	\$	260.00
									\$ 7,534.00

TASK 3 TOTAL**\$ 28,042**

TABLE 8**Corrective Action Estimate of Probable Cost (2019 Dollars)**

Lincoln County Landfill

S&ME Project No. 7335-19-051

Assumed Scenario: Release at MSW Landfill, Monitored Natural Attenuation as Selected Remedy.

TASK 4**15A NCAC 13B .1634****Appendix I and II Detects Sampling of Original Well Network and Compliance Boundary Wells Annually
(Second Semi-Annual Monitoring Event)****22 MSW Well Locations, 3 Days to Sample****Field Work (1 event)**

Technician Time (2 techs)	60	hours	at	\$	75.00	per	hour	\$	4,500.00
Mileage	300	miles	at	\$	0.58	per	mile	\$	174.00
Water Level Probe	3	days	at	\$	30.00	per	day	\$	90.00
pH/Temperature/Conductivity Meter	3	days	at	\$	40.00	per	day	\$	120.00
Gator Rental	3	days	at	\$	140.00	per	day	\$	420.00
Disposable Teflon Bailers	2	cases	at	\$	250.00	per	case	\$	500.00
Disposables (Tubing, Gloves, Ropes etc)	1	each	at	\$	150.00	per	each	\$	150.00
								\$	5,954.00

Analytical (1 event) Assume Appendix I VOCs, Appendix I Metals, and Appendix II Semi's

Appendix II - Volatiles	23	each	at	\$	82.80	per	each	\$	1,904.40
Appendix II - Semi Volatiles	22	each	at	\$	195.50	per	each	\$	4,301.00
Appendix II - Pesticides/PCB	0	each	at	\$	103.50	per	each	\$	-
Appendix II - Herbicides	0	each	at	\$	115.00	per	each	\$	-
Appendix II - Metals	22	each	at	\$	103.50	per	each	\$	2,277.00
Appendix II - CN	0	each	at	\$	40.25	per	each	\$	-
Appendix II - Sulfide	0	each	at	\$	17.25	per	each	\$	-
								\$	8,482.40

Reporting (1 event)

Senior Professional (P5)	2	hour	at	\$	165.00	per	hour	\$	330.00
Registered Professional (P4)	12	hours	at	\$	132.00	per	hour	\$	1,584.00
Project Professional (P3)	40	hours	at	\$	115.00	per	hour	\$	4,600.00
CAD Operator	8	hours	at	\$	95.00	per	hour	\$	760.00
Administration	4	hours	at	\$	65.00	per	hour	\$	260.00
								\$	7,534.00

TASK 4 TOTAL**\$ 21,970**

Corrective Action Estimate of Probable Cost (2019 Dollars)

S&ME Project No. 7335-19-051

[illegible]

Corrective Action Estimate of Probable Cost (2019 Dollars)

S&ME Project No. 7335-19-051

Soil Laboratory Classification (for porosity estimates)								
Atterberg Limits	6	each	at	\$	90.00	per	each	\$ 540.00
Grain Size with Hydrometer	6	each	at	\$	130.00	per	each	\$ 780.00
Specific Gravity	6	each	at	\$	70.00	per	each	\$ 420.00
								\$ 1,740.00
Well Survey								
Project Professional (P3)	2	hours	at	\$	115.00	per	hour	\$ 230.00
Subcontracted Survey Cost	1	each	at	\$	5,000.00	per	each	\$ 5,000.00
								\$ 5,230.00
Boring Logs, Well Logs, and Estimation of Groundwater Flow								
Registered Professional (P4)	8	hours	at	\$	132.00	per	hour	\$ 1,056.00
Project Professional (P3)	40	hours	at	\$	115.00	per	hour	\$ 4,600.00
CAD Operator	8	hours	at	\$	95.00	per	hour	\$ 760.00
Administration	4	hours	at	\$	65.00	per	hour	\$ 260.00
								\$ 6,676.00
TASK 5 TOTAL								\$ 65,015

TABLE 8**Corrective Action Estimate of Probable Cost (2019 Dollars)**

Lincoln County Landfill

S&ME Project No. 7335-19-051

Assumed Scenario: Release at MSW Landfill, Monitored Natural Attenuation as Selected Remedy.

TASK 6									
15A NCAC 13B .1634									
Appendix II Background Sampling of N&E Monitoring Network									
(4 events per sampling location)									
9 N&E Well Locations, 2 Days to Sample									
Field Work (4 events)									
Technician Time (2 techs)	160	hours	at	\$	75.00	per	hour	\$	12,000.00
Mileage	800	miles	at	\$	0.58	per	mile	\$	464.00
Water Level Probe	8	days	at	\$	30.00	per	day	\$	240.00
pH/Temperature/Conductivity Meter	8	days	at	\$	40.00	per	day	\$	320.00
Gator Rental	8	days	at	\$	140.00	per	day	\$	1,120.00
Disposable Teflon Bailers	3	cases	at	\$	250.00	per	case	\$	750.00
Disposables (Tubing, Gloves, Ropes etc)	1	each	at	\$	600.00	per	each	\$	600.00
								\$	15,494.00
Analytical (4 events)									
Appendix II - Volatiles	40	each	at	\$	82.80	per	each	\$	3,312.00
Appendix II - Semi Volatiles	36	each	at	\$	195.50	per	each	\$	7,038.00
Appendix II - Pesticides/PCB	36	each	at	\$	103.50	per	each	\$	3,726.00
Appendix II - Herbicides	36	each	at	\$	115.00	per	each	\$	4,140.00
Appendix II - Metals	36	each	at	\$	103.50	per	each	\$	3,726.00
Appendix II - CN	36	each	at	\$	40.25	per	each	\$	1,449.00
Appendix II - Sulfide	36	each	at	\$	17.25	per	each	\$	621.00
								\$	24,012.00
Reporting (1 event)									
Senior Professional (P5)	4	hour	at	\$	165.00	per	hour	\$	660.00
Registered Professional (P4)	24	hours	at	\$	132.00	per	hour	\$	3,168.00
Project Professional (P3)	40	hours	at	\$	115.00	per	hour	\$	4,600.00
CAD Operator	8	hours	at	\$	95.00	per	hour	\$	760.00
Administration	4	hours	at	\$	65.00	per	hour	\$	260.00
								\$	9,448.00
TASK 6 TOTAL								\$	48,954

TABLE 8

Corrective Action Estimate of Probable Cost (2019 Dollars)

Lincoln County Landfill

S&ME Project No. 7335-19-051

Assumed Scenario: Release at MSW Landfill, Monitored Natural Attenuation as Selected Remedy.

TASK 7									
15A NCAC 13B .1634									
Appendix II Sampling of N&E Well Network Annually									
(First Semi-Annual Monitoring Event)									
9 N&E Well Locations, 2 Days to Sample									
Field Work (1 event)									
Technician Time (2 techs)	40	hours	at	\$	75.00	per	hour	\$	3,000.00
Mileage	200	miles	at	\$	0.58	per	mile	\$	116.00
Water Level Probe	2	day	at	\$	30.00	per	day	\$	60.00
pH/Temperature/Conductivity Meter	2	day	at	\$	40.00	per	day	\$	80.00
Gator Rental	2	day	at	\$	140.00	per	day	\$	280.00
Disposable Teflon Bailers	1	case	at	\$	250.00	per	case	\$	250.00
Disposables (Tubing, Gloves, Ropes etc)	1	each	at	\$	200.00	per	each	\$	200.00
								\$	3,986.00
Analytical (1 event)									
Appendix II - Volatiles	10	each	at	\$	82.80	per	each	\$	828.00
Appendix II - Semi Volatiles	9	each	at	\$	195.50	per	each	\$	1,759.50
Appendix II - Pesticides/PCB	9	each	at	\$	103.50	per	each	\$	931.50
Appendix II - Herbicides	9	each	at	\$	115.00	per	each	\$	1,035.00
Appendix II - Metals	9	each	at	\$	103.50	per	each	\$	931.50
Appendix II - Cyanide	9	each	at	\$	40.25	per	each	\$	362.25
Appendix II - Sulfide	9	each	at	\$	17.25	per	each	\$	155.25
								\$	6,003.00
Reporting (1 event)									
Senior Professional (P5)	2	hour	at	\$	165.00	per	hour	\$	330.00
Registered Professional (P4)	8	hours	at	\$	132.00	per	hour	\$	1,056.00
Project Professional (P3)	40	hours	at	\$	115.00	per	hour	\$	4,600.00
CAD Operator	8	hours	at	\$	95.00	per	hour	\$	760.00
Administration	4	hours	at	\$	65.00	per	hour	\$	260.00
								\$	7,006.00
TASK 7 TOTAL								\$	16,995

TABLE 8**Corrective Action Estimate of Probable Cost (2019 Dollars)**

Lincoln County Landfill

S&ME Project No. 7335-19-051

Assumed Scenario: Release at MSW Landfill, Monitored Natural Attenuation as Selected Remedy.

TASK 8									
15A NCAC 13B .1634									
Appendix I and II Detects Sampling of N&E Well Network Annually									
(Second Semi-Annual Monitoring Event)									
9 N&E Well Locations, 2 Days to Sample									
Field Work (1 event)									
Technician Time (2 techs)	40	hours	at	\$	75.00	per	hour	\$	3,000.00
Mileage	200	miles	at	\$	0.58	per	mile	\$	116.00
Water Level Probe	2	day	at	\$	30.00	per	day	\$	60.00
pH/Temperature/Conductivity Meter	2	day	at	\$	40.00	per	day	\$	80.00
Gator Rental	2	day	at	\$	140.00	per	day	\$	280.00
Disposable Teflon Bailers	1	case	at	\$	250.00	per	case	\$	250.00
Disposables (Tubing, Gloves, Ropes etc)	1	each	at	\$	150.00	per	each	\$	150.00
								\$	3,936.00
Analytical (1 event) Assume Appendix I VOCs, Appendix I Metals, and Appendix II Semi's									
Appendix II - Volatiles	10	each	at	\$	82.80	per	each	\$	828.00
Appendix II - Semi Volatiles	9	each	at	\$	195.50	per	each	\$	1,759.50
Appendix II - Pesticides/PCB	0	each	at	\$	103.50	per	each	\$	-
Appendix II - Herbicides	0	each	at	\$	115.00	per	each	\$	-
Appendix II - Metals	9	each	at	\$	103.50	per	each	\$	931.50
Appendix II - CN	0	each	at	\$	40.25	per	each	\$	-
Appendix II - Sulfide	0	each	at	\$	17.25	per	each	\$	-
								\$	3,519.00
Reporting (1 event)									
Senior Professional (P5)	2	hour	at	\$	165.00	per	hour	\$	330.00
Registered Professional (P4)	8	hours	at	\$	132.00	per	hour	\$	1,056.00
Project Professional (P3)	40	hours	at	\$	115.00	per	hour	\$	4,600.00
CAD Operator	8	hours	at	\$	95.00	per	hour	\$	760.00
Administration	4	hours	at	\$	65.00	per	hour	\$	260.00
								\$	7,006.00
TASK 8 TOTAL								\$	14,461

TABLE 8**Corrective Action Estimate of Probable Cost (2019 Dollars)**

Lincoln County Landfill

S&ME Project No. 7335-19-051

Assumed Scenario: Release at MSW Landfill, Monitored Natural Attenuation as Selected Remedy.

TASK 9									
15A NCAC 13B .1635									
Assessment of Corrective Measures									
(Report, Public Notice, Public Meeting)									
ACM Report									
Senior Professional (P5)	10	hours	at	\$	165.00	per	hour	\$	1,650.00
Registered Professional (P4)	120	hours	at	\$	132.00	per	hour	\$	15,840.00
Project Professional (P3)	120	hours	at	\$	115.00	per	hour	\$	13,800.00
CAD Operator	40	hours	at	\$	95.00	per	hour	\$	3,800.00
Administration	8	hours	at	\$	65.00	per	hour	\$	520.00
								\$	35,610.00
Public Notice									
Senior Professional (P5)	1	hour	at	\$	165.00	per	hour	\$	82.50
Registered Professional (P4)	12	hours	at	\$	132.00	per	hour	\$	1,584.00
Administration	4	hours	at	\$	65.00	per	hour	\$	260.00
Estimated Advertisement Costs	1	each	at	\$	1,500.00	per	each	\$	1,500.00
								\$	3,426.50
Public Meeting									
Senior Professional (P5)	8	hours	at	\$	165.00	per	hour	\$	1,320.00
Registered Professional (P4)	24	hours	at	\$	132.00	per	hour	\$	3,168.00
								\$	4,488.00
TASK 9 TOTAL								\$	43,525

TABLE 8**Corrective Action Estimate of Probable Cost (2019 Dollars)**

Lincoln County Landfill

S&ME Project No. 7335-19-051

Assumed Scenario: Release at MSW Landfill, Monitored Natural Attenuation as Selected Remedy.

TASK 10									
15A NCAC 13B .1636									
Selection of Remedy									
Permit Modification Application									
Senior Professional (P5)	4	hours	at	\$	165.00	per	hour	\$	660.00
Registered Professional (P4)	40	hours	at	\$	132.00	per	hour	\$	5,280.00
Administration	4	hours	at	\$	65.00	per	hour	\$	260.00
								\$	6,200.00
Permit Modification Fee									
Estimated Fee	1	each	at	\$	15,000.00	per	each	\$	15,000.00
								\$	15,000.00
TASK 10 TOTAL								\$	21,200

Corrective Action Estimate of Probable Cost (2019 Dollars)

S&ME Project No. 7335-19-051

TASK 11								
15A NCAC 13B .1636 and .1637								
Corrective Action Plan Submittal, Approval, and Implementation								
CAP Report								
Senior Professional (P5)	12	hours	at	\$	165.00	per hour	\$	1,980.00
Registered Professional (P4)	40	hours	at	\$	132.00	per hour	\$	5,280.00
Project Professional (P3)	40	hours	at	\$	115.00	per hour	\$	4,600.00
CAD Operator	8	hours	at	\$	95.00	per hour	\$	760.00
Administration	4	hours	at	\$	65.00	per hour	\$	260.00
								\$ 12,880.00
CAP Implementation (Assume MNA)								
<u>Baseline Sampling of MNA Performance Parameters</u>								
(Assume 1 background well, 14 performance wells, and 5 sentinel wells)								
Field Work (4 events, 3 days per event)								
Technician Time (2 techs)	240	hours	at	\$	75.00	per hour	\$	18,000.00
Mileage	1,200	miles	at	\$	0.58	per mile	\$	696.00
Water Level Probe	12	days	at	\$	30.00	per day	\$	360.00
Multi-parameter meter with flow cell (Hydrolab)	12	days	at	\$	125.00	per day	\$	1,500.00
Hydrolab Calibration Consumables	4	each	at	\$	90.00	per each	\$	360.00
Turbidity Meter	12	days	at	\$	35.00	per day	\$	420.00
Gator Rental	4	weeks	at	\$	140.00	per week	\$	560.00
Bladder Pump (including controls)	12	days	at	\$	135.00	per day	\$	1,620.00
Disposable Bladders (pack of 10)	8	each	at	\$	115.00	per each	\$	920.00
Dedicated Tubing (1 time expense)	1	each	at	\$	4,500.00	per each	\$	4,500.00
								\$ 28,936.00
Analytical (4 events)								
Nitrate	80	each	at	\$	17.25	per each	\$	1,380.00
Iron	80	each	at	\$	13.80	per each	\$	1,104.00
Sulfate	80	each	at	\$	19.55	per each	\$	1,564.00
Sulfide	80	each	at	\$	17.25	per each	\$	1,380.00
Methane, Ethane, Ethene, CO2	80	each	at	\$	126.50	per each	\$	10,120.00
TOC/BOD/COD	80	each	at	\$	126.50	per each	\$	10,120.00
Alkalinity	80	each	at	\$	17.25	per each	\$	1,380.00
Chloride	80	each	at	\$	17.25	per each	\$	1,380.00
Volatile Fatty Acids	80	each	at	\$	126.50	per each	\$	10,120.00
								\$ 38,548.00

Corrective Action Estimate of Probable Cost (2019 Dollars)

S&ME Project No. 7335-19-051

[illegible]

TABLE 8**Corrective Action Estimate of Probable Cost (2019 Dollars)**

Lincoln County Landfill

S&ME Project No. 7335-19-051

Assumed Scenario: Release at MSW Landfill, Monitored Natural Attenuation as Selected Remedy.

Corrective Action Evaluation Report (6 reports, 1 report every 5 years)									
Senior Professional (P5)	60	hour	at	\$	165.00	per	hour	\$	9,900.00
Registered Professional (P4)	360	hours	at	\$	132.00	per	hours	\$	47,520.00
Project Professional (P3)	240	hours	at	\$	115.00	per	hours	\$	27,600.00
CAD Operator	48	hours	at	\$	95.00	per	hours	\$	4,560.00
Administration	30	hours	at	\$	65.00	per	hours	\$	1,950.00
								\$	91,530.00
TASK 11 TOTAL								\$	1,624,222

Corrective Action Estimate of Probable Cost (2019 Dollars)

S&ME Project No. 7335-19-051

[illegible]

TABLE 8

Corrective Action Estimate of Probable Cost (2019 Dollars)

Lincoln County Landfill

S&ME Project No. 7335-19-051

Assumed Scenario: Release at MSW Landfill, Monitored Natural Attenuation as Selected Remedy.

Boring Logs, Well Logs, and Estimation of Groundwater Flow									
Registered Professional (P4)	8	hours	at	\$	132.00	per	hour	\$	1,056.00
Project Professional (P3)	40	hours	at	\$	115.00	per	hour	\$	4,600.00
CAD Operator	8	hours	at	\$	95.00	per	hour	\$	760.00
Administration	4	hours	at	\$	65.00	per	hour	\$	260.00
								\$	6,676.00
TASK 12 TOTAL								\$	41,164

TABLE 8

Corrective Action Estimate of Probable Cost (2019 Dollars)

Lincoln County Landfill

S&ME Project No. 7335-19-051

Assumed Scenario: Release at MSW Landfill, Monitored Natural Attenuation as Selected Remedy.

TASK 13									
15A NCAC 13B .1636 and .1637									
Maintenance and Repair of Additional Monitoring Wells									
<u>Assume Repair of 5 Protective Covers</u>									
Drilling Services									
Repair of Protective Cover (Lump Sum)	5	each	at	\$	1,500.00	per	each	\$	7,500.00
								\$	7,500.00
TASK 13 TOTAL								\$	7,500

TABLE 8
Corrective Action Estimate of Probable Cost (2019 Dollars)

Lincoln County Landfill
S&ME Project No. 7335-19-051

Assumed Scenario: Release at MSW Landfill, Monitored Natural Attenuation as Selected Remedy.

TASK 14	
15A NCAC 13B .1636 and .1637	
Sampling and Analysis of Additional Monitoring Wells	
This item is included in Task 11	
TASK 14 TOTAL	\$ -

TABLE 8**Corrective Action Estimate of Probable Cost (2019 Dollars)**

Lincoln County Landfill

S&ME Project No. 7335-19-051

Assumed Scenario: Release at MSW Landfill, Monitored Natural Attenuation as Selected Remedy.

TASK 15									
15A NCAC 13B .1637									
Corrective Action Remedy is Complete									
Report Demonstrating Corrective Action is Complete									
Senior Professional (P5)	12	hours	at	\$	165.00	per	hour	\$	1,980.00
Registered Professional (P4)	40	hours	at	\$	132.00	per	hour	\$	5,280.00
Project Professional (P3)	32	hours	at	\$	115.00	per	hour	\$	3,680.00
CAD Operator	16	hours	at	\$	95.00	per	hour	\$	1,520.00
Administration	6	hours	at	\$	65.00	per	hour	\$	390.00
								\$	12,850.00
TASK 15 TOTAL								\$	12,850