FAX COVER

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TVA 15536 (5-1999)

ATTACHMENT 1
CLOSURE QUANTITIES

TABLE A1 – COMPACTED CLAY FINAL COVER			
ITEM	DESCRIPTION	UNITS	Quantity
1.00	1' of Compacted Clay Soil 95% Std Proctor	bcy	103907
	Placed in 6" lift		
2.00	1' of Vegetated Clay Layer 90% Std.	bcy	103907
3.00	Seeding	ac	64.4
4.00	Erosion Control Matting	sy	311722

TABLE A2 – GEOCOMPOSITE FINAL COVER			
ITEM	DESCRIPTION	UNITS	Quantity
1.00	Geomembrane	sy	311722
2.00	Geocomposite Drainage Layer	sy	311722
3.00	1' Cover Soil	bcy	103907
4.00	6" Vegetation Layer	bcy	51954
5.00	Seed	ac	64.4
6.00	Erosion Control Matting	sy	311722

ATTACHMENT 2
CLOSURE/POST CLOSURE COST ESTIMATES

Cost Estimate
Work Sheet A
Closure Activities

Notes:
1) This worksheet is to be submitted as part of the C/PC Plan.
2) Provide a cost for all activities which apply.
3) Additional cost information may be attached as needed.

1. Establishing final cover:

A. Top Soil

1.	Quantity Needed (cu.yd.)	103907
2.	Excavation unit cost ($/cu.yd.)	$3.95
3.	Excavation cost (1.x 2.)	$410,203.57
4.	Placement / spreading unit cost ($/cu.yd.)	$9.21
5.	Placement cost (1.x 4.)	$957,141.66
* TOTAL:	Top Soil (3.+ 5.)	$1,367,345.23

B. Landfill cap

1. On-site Clay

a.	Quantity needed (cu.yd.)	
b.	Excavation unit cost ($/cu.yd.)	
c.	Excavation cost (a.x b.)	
d.	Placement / spreading unit cost ($/cu.yd.)	
e.	Placement cost (a.x d.)	
f.	Compaction unit cost ($/cu.yd.)	
g.	Compaction cost (a.x f.)	
* TOTAL	On-site Clay (c.+ e.+ g.)	0

2. Off-site Clay

a.	Quantity needed (cu.yd.)	103907
b.	Purchase unit cost ($/cu.yd.)	$1.32
c.	Purchase cost (a.x b.)	$136,734.52
d.	Delivery unit cost ($/cu.yd.)	$5.26
e.	Delivery cost (a.x d.)	$546,938.09
f.	Placement / spreading unit cost ($/cu.yd.)	$2.63
g.	Placement cost (a.x f.)	$273,469.05
h.	Compaction unit cost ($/cu.yd.)	$1.32
i.	Compaction cost (a.x h.)	$136,734.52
* TOTAL	Off-site Clay (c.+ e.+ g.+ i.)	$1,093,876.19

3. Quality control/testing of clay

a.		
b.		
c.		
* TOTAL	Clay testing (LS)	$26,318.64

C. Synthetic Membrane

1.	Quantity needed (sq.yd.)	
2.	Purchase unit cost ($/sq.yd.)	
3.	Purchase cost (1.x 2.)	
4.	Installation unit cost ($/sq.yd.)	
5.	Installation cost (1.x 4.)	
* TOTAL	Synthetic Membrane (3.+ 5.)	0

D. Geotextile Filter Fabric

1.	Quantity needed (sq.yd.)	
2.	Purchase unit cost ($/sq.yd.)	
3.	Purchase cost (1.x 2.)	
4.	Installation unit cost ($/sq.yd.)	
5.	Installation cost (1.x 4.)	
* TOTAL	Geotextile Filter Fabric (3.+ 5.)	0

TOTAL for establishing final cover (*): (A.+ B.+ C.+ D.) $2,487,540.06

2. Establishing vegetation cover

A.	Labor ($/acre)	$460.58
B.	Seeding ($/acre)	$460.58
C.	Fertilizing ($/acre)	$328.98
D.	Erosion control matting ($/acre)	$65.80
E.	Number of acres	64.4

TOTAL for establishing vegetation cover: E.x (A.+ B.+ C.+ D.) $84,746.01

3. Establishing or completing a systen to minimize and control erosion/sedimentation:

A. Sediment pond

1.	Excavation/construction ($)	
2.	Materials (e.g. pipe, riprap) ($)	
* TOTAL	(1.+ 2.)	0

B. Diversion ditch

1.	Construction ($)	
2.	Materials ($)	
* TOTAL	(1.+ 2.)	0

C. Temporary structures

1.	Comstruction ($)	
2.	Materials ($)	

* TOTAL (1.+ 2.)	0
TOTAL for extablishing or completing a system to minimize and control erosion and sedimentation (*): (A.+ B.+ C.)	0

4. Establishing or completing leachate collection removal, and treatment system:

A. Installation	
1. Number of feet	
2. Piping system unit cost ($/ft)	
3. Piping system cost (1.x 2.)	
4. Storage tanks ($)	
5. Pumps ($)	
TOTAL for establishing or completing leachate system: (3.+ 4.+ 5.)	0

5. Establishing or completing a system to collect or vent gases:

A. Installation	
1. Materials (e.g. piping)	
2. Equipment (e.g. pumps)	
3. Labor (e.g. drilling)	
TOTAL for establishing or completing a system to collect or vent gases: (1.+ 2.+ 3.)	0

6. Establishing or completing groundwater/surface water monitoring system:

A.	
1. Number of wells	
2. Drilling unit cost ($/well)	
3. Drilling cost (1.x 2.)	
4. Materials unit cost ($/well)	
5. Materials (1.x 4.)	
6. Equipment (e.g. pumps)	
7. Labor	
TOTAL for establishing or completing groundwater monitoring system: (3.+ 5.+ 6.+ 7.)	0
TOTAL CLOSURE COSTS: (Sum of TOTALS for section 1. thru 6.)	**$2,572,286.06**

Cost Estimate
Work Sheet B
Post Closure Activities

Notes:
1) This worksheet is to be submitted as part of the C/PC Plan.
2) This facility will be maintained and monitired for 30 years after final closure of Class I and II landfills and 2 years after final closure of Class III and IV landfills.
3) Fill in blanks for all activities which apply.
4) All costs are to be calculated on an ANNUAL BASIS.

1. Survey inspections to confirm final grade and drainage are maintained:	
A. Transportation	INCLUSIVE
B. Labor	INCLUSIVE
TOTAL for Surveying inspections: (A.+ B.)	$15,791.18
2. Maintain healthy vegetation:	
A. Transportation	INCLUSIVE
B. Labor	$3,947.80
C. Seeding	$3,947.80
D. Fertilizing	$2,763.46
E. Mulching	$657.97
F. Rodent Control	N/A
G. Mowing	$15,791.18
TOTAL for Maintaining healthy vegetation: (A.+ B.+ C.+ D.+ E.+ F.+ G.)	$27,108.19
3. Maintain the drainage facilities, sediment ponds and other erosion/sedimentation control measures.	
A. Transportation	N/A
B. Labor	$7,895.59
C. Cleaning out of systems	
D. Repair of gullies or rills	$7,895.59
1 Soil aquistion	
a. Quantity	1000
b. Purchase unit cost ($/cu.yd.)	$1.32
c. Purchase cost (a.x b.)	$1,315.93
d. Delivery unit cost ($/cu.yd.)	$5.26
e. Delivery cost (a.x d.)	$5,263.73
2. Placement/spreading/compaction	5000
3. Revegetation	3000
TOTAL D: (1.+ 2.+ 3.)	8000
TOTAL for Maintaining drainage: (A.+ B.+ C.+ D.)	$23,791.18

4. Maintain and monitor the leachate collection, removal and treatment system:

A. Treatment of leachate
   1. On-site
      a. Quantity (cu.yd.) _____
      b. Treatment unit cost ($/cu.yd) _____
      c. Treatment costs (a.+ b.) _____
      d. Sewer discharge unit cost _____
      e. Discharge costs (a.+ d.) _____

   Total 1: On-Site (c.+e.) N/A

   2. Off-site
      a. Quantity (cu.yd.) _____
      b. Hauling unit cost ($/cu.yd.) _____
      c. Hauling cost (a.x b.) _____
      d. Treatment unit cost ($/cu.yd) _____
      e. Treatment costs (a.+ d.) _____

   Total 2: Off-Site (c.+e.) N/A

   *TOTAL: (1 or 2 Total) 0

B. Maintenance of leachate collection system:
   1. Transportation _____
   2. Labor _____
   3. Repairs/Materials _____
      a. Pumps _____
      b. Cleaning out system _____
      c. Leak detection _____
      d. Other _____

   Total 3: (a.+ b.+c.+d.) _____

   *TOTAL : (1.+ 2.+ 3.) N/A

TOTAL for Monitoring and maintaining leachate system (*): (A.+ B.) 0

5. Maintain and monitor the gas collection or venting system:
   A. Transportation _____
   B. Labor _____
   C. Repairs/Materials _____
      1. Cleaning _____
      2. Caps _____
      3. Other _____

   Total: (1.+ 2.+ 3.) N/A

TOTAL for maintaining and monitoring gas control systems: (A.+ B.+ C.) 0

6. Maintain and monitor the groundwater and/or surface water monitoring system:

A. Monitoring of groundwater systems:	
1. Number of wells/springs	5
2. Number of samples/well	2
3. Unit costs of analysis	$1,315.93
4. Cost of sampling + analysis (1.x 2.x 3.)	$13,159.32
5. Labor cost per well	INCLUSIVE
6. Labor costs (1.x 5.)	INCLUSIVE
*TOTAL A: (4.+ 6.)	$13,159.32
B. Inspection and maintenance of system:	
1. Transportation	N/A
2. Labor	$5,263.73
3. Repairs/Materials	$526.37
a. Caps	$526.37
b. Tubing	$526.37
c. Pumps	$526.37
d. Well replacement	$526.37
e. Other	$526.37
Total 3: (a.+ b.+ c.+ d.+ e.)	$2,631.86
*TOTAL B: (1.+ 2.+ 3.)	$7,895.59
TOTAL for Maintaining and monitoring groundwater systems(*): (A.+ B.)	$21,054.91

TOTAL POST CLOSURE COSTS:

Annual Basis: (Sum of sections 1. thru 6.)	$87,745.47
Inflation Rate Utilized:	5.00%
30 Year Basis: (Annual Cost)(Inflation rate)(30yr)	$6,063,773

BRF Area 1, A, and 2 Post Closure Costs

Annual Cost	Year	Inflation Rate (%)	Annual Cost w/Inflation
87745	1	5.0	92133
	2		95818
	3		100609
	4		105639
	5		110921
	6		116467
	7		122291
	8		128405
	9		134826
	10		141567
	11		148645
	12		156078
	13		163881
	14		172075
	15		180679
	16		189713
	17		199199
	18		209159
	19		219617
	20		230598
	21		242127
	22		254234
	23		266945
	24		280293
	25		294307
	26		309023
	27		324474
	28		340698
	29		357732
	30		375619
Total			6063773

Cost Estimate
Work Sheet A
Closure Activities

Notes:
1) This worksheet is to be submitted as part of the C/PC Plan.
2) Provide a cost for all activities which apply.
3) Additional cost information may be attached as needed.

1. Establishing final cover:

A. Top Soil

1.	Quantity Needed (cu.yd.)	51954
2.	Excavation unit cost ($/cu.yd.)	$3.95
3.	Excavation cost (1.x 2.)	$205,103.76
4.	Placement / spreading unit cost ($/cu.yd.)	$9.21
5.	Placement cost (1.x 4.)	$478,575.44
	* TOTAL: Top Soil (3.+ 5.)	$683,679.20

B. Landfill cap

1. On-site Clay

a.	Quantity needed (cu.yd.)	
b.	Excavation unit cost ($/cu.yd.)	
c.	Excavation cost (a.x b.)	
d.	Placement / spreading unit cost ($/cu.yd.)	
e.	Placement cost (a.x d.)	
f.	Compaction unit cost ($/cu.yd.)	
g.	Compaction cost (a.x f.)	
	* TOTAL On-site Clay (c.+ e.+ g.)	0

2. Off-site Clay

a.	Quantity needed (cu.yd.)	103907
b.	Purchase unit cost ($/cu.yd.)	$1.32
c.	Purchase cost (a.x b.)	$136,734.52
d.	Delivery unit cost ($/cu.yd.)	$5.26
e.	Delivery cost (a.x d.)	$546,938.09
f.	Placement / spreading unit cost ($/cu.yd.)	$2.63
g.	Placement cost (a.x f.)	$273,469.05
h.	Compaction unit cost ($/cu.yd.)	$1.32
i.	Compaction cost (a.x h.)	$136,734.52
	* TOTAL Off-site Clay (c.+ e.+ g.+ i.)	$1,093,876.19

3. Quality control/testing of clay

a.		
b.		
c.		
	* TOTAL Clay testing (LS)	$26,318.64

C. Synthetic Membrane

1.	Quantity needed (sq.yd.)	311722
2.	Purchase unit cost ($/sq.yd.)	4.5
3.	Purchase cost (1.x 2.)	1402749
4.	Installation unit cost ($/sq.yd.)	0.1
5.	Installation cost (1.x 4.)	31172
* TOTAL	Synthetic Membrane (3.+ 5.)	1433921

D. Geotextile Filter Fabric (Geocomposite drainage layer)

1.	Quantity needed (sq.yd.)	311722
2.	Purchase unit cost ($/sq.yd.)	4.5
3.	Purchase cost (1.x 2.)	1402749
4.	Installation unit cost ($/sq.yd.)	0.1
5.	Installation cost (1.x 4.)	31172
* TOTAL	Geotextile Filter Fabric (3.+ 5.)	1433921

TOTAL for establishing final cover (*): $4,671,716.42
(A.+ B.+ C.+ D.)

2. Establishing vegetation cover

A.	Labor ($/acre)	$460.58
B.	Seeding ($/acre)	$460.58
C.	Fertilizing ($/acre)	$328.98
D.	Erosion control matting ($/acre)	$65.80
E.	Number of acres	64.4

TOTAL for establishing vegetation cover: $84,746.01
E.x (A.+ B.+ C.+ D.)

3. Establishing or completing a systen to minimize and control erosion/sedimentation:

A. Sediment pond

1.	Excavation/construction ($)	
2.	Materials (e.g. pipe, riprap) ($)	
* TOTAL	(1.+ 2.)	0

B. Diversion ditch

1.	Construction ($)	
2.	Materials ($)	
* TOTAL	(1.+ 2.)	0

C. Temporary structures

1. Comstruction ($) _____
2. Materials ($) _____

* TOTAL (1.+ 2.) 0

TOTAL for extablishing or completing a system to minimize and control erosion and sedimentation (*): (A.+ B.+ C.) 0

4. Establishing or completing leachate collection removal, and treatment system:
   A. Installation
      1. Number of feet _____
      2. Piping system unit cost ($/ft) _____
      3. Piping system cost (1.x 2.) _____
      4. Storage tanks ($) _____
      5. Pumps ($) _____

   TOTAL for establishing or completing leachate system: (3.+ 4.+ 5.) 0

5. Establishing or completing a system to collect or vent gases:
   A. Installation
      1. Materials (e.g. piping) _____
      2. Equipment (e.g. pumps) _____
      3. Labor (e.g. drilling) _____

   TOTAL for establishing or completing a system to collect or vent gases: (1.+ 2.+ 3.) 0

6. Establishing or completing groundwater/surface water monitoring system:
   A.
      1. Number of wells _____
      2. Drilling unit cost ($/well) _____
      3. Drilling cost (1.x 2.) _____
      4. Materials unit cost ($/well) _____
      5. Materials (1.x 4.) _____
      6. Equipment (e.g. pumps) _____
      7. Labor _____

   TOTAL for establishing or completing groungwater monitoring system: (3.+ 5.+ 6.+ 7.) 0

TOTAL CLOSURE COSTS: **$4,756,462.43**
(Sum of TOTALS for section 1. thru 6.)

Cost Estimate
Work Sheet B
Post Closure Activities

Notes:
1) This worksheet is to be submitted as part of the C/PC Plan
2) This facility will be maintained and monitired for 30 years after final closure of Class I and II landfills and 2 years after final closure of Class III and IV landfills.
3) Fill in blanks for all activities which apply.
4) All costs are to be calculated on an ANNUAL BASIS.

1. Survey inspections to confirm final grade and drainage are maintained:	
A. Transportation	INCLUSIVE
B. Labor	INCLUSIVE
TOTAL for Surveying inspections: (A.+ B.)	$15,791.18
2. Maintain healthy vegetation:	
A. Transportation	INCLUSIVE
B. Labor	$3,947.80
C. Seeding	$3,947.80
D. Fertilizing	$2,763.46
E. Mulching	$657.97
F. Rodent Control	N/A
G. Mowing	$15,791.18
TOTAL for Maintaining healthy vegetation: (A.+ B.+ C.+ D.+ E.+ F.+ G.)	$27,108.19
3. Maintain the drainage facilities, sediment ponds and other erosion/sedimentation control measures.	
A. Transportation	N/A
B. Labor	$7,895.59
C. Cleaning out of systems	
D. Repair of gullies or rills	$7,895.59
1. Soil aquistion	
a. Quantity	1000
b. Purchase unit cost ($/cu.yd.)	$1.32
c. Purchase cost (a.x b.)	1315.93
d. Delivery unit cost ($/cu.yd.)	$5.26
e. Delivery cost (a.x d.)	5263.73
2. Placement/spreading/compaction	5000
3. Revegetation	3000
TOTAL D: (1.+ 2.+ 3.)	8000
TOTAL for Maintaining drainage: (A.+ B.+ C.+ D.)	$23,791.18

4. Maintain and monitor the leachate collection, removal and treatment system:

A. Treatment of leachate
   1. On-site
      a. Quantity (cu.yd.) _____
      b. Treatment unit cost ($/cu.yd) _____
      c. Treatment costs (a.+ b.) _____
      d. Sewer discharge unit cost _____
      e. Discharge costs (a.+ d.) _____

   Total 1: On-Site (c.+e.) N/A

   2. Off-site
      a. Quantity (cu.yd.) _____
      b. Hauling unit cost ($/cu.yd.) _____
      c. Hauling cost (a.x b.) _____
      d. Treatment unit cost ($/cu.yd) _____
      e. Treatment costs (a.+ d.) _____

   Total 2: Off-Site (c.+e.) N/A

*TOTAL: (1 or 2 Total) N/A

B. Maintenance of leachate collection system:
   1. Transportation _____
   2. Labor _____
   3. Repairs/Materials _____
      a. Pumps _____
      b. Cleaning out system _____
      c. Leak detection _____
      d. Other _____

   Total 3: (a.+ b.+c.+d.) _____

   *TOTAL : (1.+ 2.+ 3.) N/A

TOTAL for Monitoring and maintaining leachate system (*): (A.+ B.) 0

5. Maintain and monitor the gas collection or venting system:
   A. Transportation _____
   B. Labor _____
   C. Repairs/Materials _____
      1. Cleaning _____
      2. Caps _____
      3. Other _____

   Total: (1.+ 2.+ 3.) N/A

TOTAL for maintaining and monitoring gas control systems: (A.+ B.+ C.) 0

6. Maintain and monitor the groundwater and/or surface water monitoring system:

A. Monitoring of groundwater systems:	
1. Number of wells/springs	5
2. Number of samples/well	2
3. Unit costs of analysis	$1,315.93
4. Cost of sampling + analysis (1.x 2.x 3.)	$13,159.32
5. Labor cost per well	INCLUSIVE
6. Labor costs (1.x 5.)	INCLUSIVE
*TOTAL A: (4.+ 6.)	$13,159.32
B. Inspection and maintenance of system:	
1. Transportation	N/A
2. Labor	$5,263.73
3. Repairs/Materials	$526.37
a. Caps	$526.37
b. Tubing	$526.37
c. Pumps	$526.37
d. Well replacement	$526.37
e. Other	$526.37
Total 3: (a.+ b.+ c.+ d.+ e.)	$2,631.86
*TOTAL B: (1.+ 2.+ 3.)	$7,895.59
TOTAL for Maintaining and monitoring groundwater systems(*): (A.+ B.)	$21,054.91

TOTAL POST CLOSURE COSTS:

Annual Basis: (Sum of sections 1. thru 6.)	$87,745.47
Inflation Rate Utilized:	5.00%
30 Year Basis: (Annual Cost)(Inflation rate)(30yr)	$6,063,773

Annual Cost	Year	Inflation Rate (%)	Annual Cost w/Inflation
87745.47	1	5.0	92133
	2		95818
	3		100609
	4		105639
	5		110921
	6		116467
	7		122291
	8		128405
	9		134826
	10		141567
	11		148645
	12		156078
	13		163881
	14		172075
	15		180679
	16		189713
	17		199199
	18		209159
	19		219617
	20		230598
	21		242127
	22		254234
	23		266945
	24		280293
	25		294307
	26		309023
	27		324474
	28		340698
	29		357732
	30		375619
	Total		6063773