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**130 ENVIRONMENTAL PARK  
CALDWELL COUNTY, TEXAS  
TCEQ PERMIT APPLICATION NO. MSW 2383**

**TYPE I PERMIT APPLICATION**

**VOLUME 5 OF 5**

Prepared for

**130 ENVIRONMENTAL PARK, LLC**

August 2013  
Revised February 2014  
Revised June 2014

Revised August 2014



Prepared by

Biggs & Mathews, Inc.  
Firm Registration No. F-834

**BIGGS & MATHEWS ENVIRONMENTAL**

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**PART IV SITE OPERATING PLAN**



Biggs & Mathews, Inc.  
Firm Registration No. F-834

*[Handwritten Signature]*  
8/21/14

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CALDWELL COUNTY, TEXAS  
TCEQ PERMIT NO. MSW 2383**

**TYPE I PERMIT APPLICATION**

**PART III – FACILITY INVESTIGATION AND DESIGN  
ATTACHMENT G  
LANDFILL GAS MANAGEMENT PLAN**

Prepared for

**130 ENVIRONMENTAL PARK, LLC**

February 2014  
Revised June 2014

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Biggs & Mathews Environmental, Inc.  
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*J. Heath Parker*  
8/21/14

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*J. Heath Parker*  
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Landfill Gas Monitoring Probe Boring/Completion Logs



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8/21/14



## 2.6 Underground Utilities

There are no underground utility lines or easements that enter or exit the 130 Environmental Park facility boundary.

## 2.7 Summary

~~The geologic, hydrogeologic, and hydraulic conditions were evaluated to ensure that the selected monitoring frequency would be sufficient to identify potential landfill gas migration before it can travel a significant distance outside the permit boundary. Based on the expected influence of these conditions on the transport rate for landfill gas migration, it has been determined that quarterly monitoring will be sufficient to meet the requirements of 30 TAC §330.371(b).~~

The factors discussed in Sections 2.2 through 2.6 above, and the provisions of 30 TAC §330.371 were considered in determining the type and frequency of LFG monitoring. Consideration of the soil conditions (clay that extends to depths well below the proposed waste fill depths and that has a permeability of approximately  $5 \times 10^{-8}$  cm/sec and an absence of secondary structures that would provide pathways for gas migration) and the absence of utility lines or pipelines near the proposed landfill unit (or anywhere within the facility boundary) support the conclusion that there is a very low probability of subsurface LFG migration from the proposed landfill unit (which will include composite liner systems fully compliant with 30 TAC §330.331(b)) to facility structures or the facility boundary; this conclusion is not affected by hydrogeologic or hydraulic conditions. The location of the facility structures (all more than 1,200 feet from the proposed landfill unit) further supports the conclusion that there is limited potential for LFG migration to affect these structures. Nevertheless, as described in Section 3.2 below, the facility LFG monitoring program will include locating in each facility structure a continuous monitor/alarm that will provide an audible alarm if methane concentrations exceed 1.25 percent methane by volume. The location of the property boundaries (which vary from approximately 300 feet to more than 4,000 feet from the proposed landfill unit) further supports the conclusion that there is limited potential for LFG to affect other properties. However, as described in Section 3.1 below, LFG monitoring at the facility will also include a perimeter network of 33 permanent gas probes located near the facility boundary and spaced a maximum of 600 feet apart (300 feet on the north side of the site where several nearby residences are located). The factors discussed above in support of the conclusion that there is limited potential for migration of LFG to reach the facility boundary also support a monitoring frequency consistent with the quarterly minimum set out in 30 TAC §330.371, subject to more frequent monitoring (a) if required by the executive director and (b) at any location where monitoring results indicate that landfill gas migration is occurring.

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**PART III – FACILITY INVESTIGATION AND DESIGN**

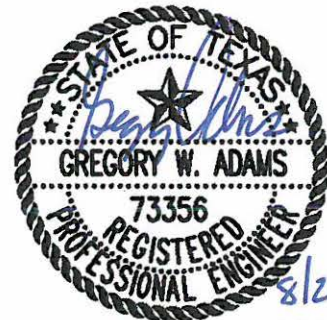
**ATTACHMENT H  
CLOSURE PLAN**

Prepared for

**130 ENVIRONMENTAL PARK, LLC**

February 2014  
Revised June 2014

Revised August 2014



Prepared by

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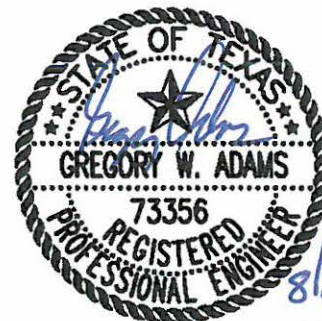
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Figure H1.2 Affidavit to the Public

### APPENDIX H2 – FINAL COVER SYSTEM DETAILS



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### 3 CLOSURE PROCEDURES

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30 TAC §330.457

#### 3.1 Closure Sequence

130 Environmental Park will conduct sequential closure as areas are completed to design grades of the landfill throughout the life of the landfill. The procedure allows for successive closure of fill areas by placement of final cover, construction of drainage and erosion control features, and establishment of vegetative cover. This procedure will be followed until all cells have been closed. All areas, regardless of the time of closure, will be closed in accordance with the applicable regulations and the closure plan, and a Final Cover Evaluation Report (FCER) will be submitted to TCEQ documenting closure activities.

#### 3.2 Closure During Active Life

As described above, the final cover will be constructed as fill areas achieve the design contours. Should closure of the landfill become necessary at any time during the active life of the landfill, the following steps shall be taken:

- The final waste received will be placed and properly compacted.
- The Large Items Storage Area, Used/Scrap Tire Storage Area, Citizen's Convenience Center, Wood Waste Processing Area, Leachate Storage Area, Reusable Materials Staging Area, and Truck Wheel Wash will be closed and dismantled as described in Section 4.2. All waste, waste residue and demolition materials from these facilities will be disposed in the landfill.
- Cell excavations will be filled with suitable material, and the site will be graded to promote runoff and prevent ponding.
- The top of the landfill will be regraded and reshaped as needed to provide the appropriate slope for positive drainage.
- The final cover system will be constructed consistent with the details included in Appendix H2 – Final Cover System Details.
- During the first growing season following application of final cover, the site will be vegetated with appropriate grasses to minimize erosion.
- A surface water management system will be constructed to minimize erosion.
- A closure certification will be prepared by a registered professional engineer and submitted to the TCEQ for approval.
- All proper notices and documentations will be filed with the appropriate agencies.

## 4 CLOSURE SCHEDULE

30 TAC §330.457, §330.461

### 4.1 Final Cover Construction

Final cover will be placed in separate construction phases as areas reach the design top of waste grades. Generally, the final cover will be placed in phases of 10 to 30 acres. Final cover placement over completed portions of the site will consist of the following steps:

- Survey controls will be implemented to control the filling of solid waste to the bottom level of the daily/intermediate cover layer elevation.
- The final cover system layers will be constructed. Testing of the various components of the final cover system will be performed in accordance with Attachment D8.
- A final cover certification report and an as-built survey will be prepared by an independent registered professional engineer and submitted to the TCEQ for approval.
- The TCEQ-approved final cover certification report will be maintained in the site operating record and the final cover log will be updated to reflect the area where final cover has been placed. The TCEQ region office will also be notified where final cover has been placed.

### 4.2 Closure of Storage and Transfer Units

The Large Item Storage Area, Citizen's Convenience Center, Used/scrap Tire Storage Area, Wood Waste Processing Area, Leachate Storage Facility, Reusable Materials Staging Area, and Truck Wheel Wash will be closed in accordance with 30 TAC §330.459. The storage and transfer units may be closed during the active life of the landfill or upon final closure, except for the leachate storage facility which will remain operational throughout the post-closure care period. Closure of the leachate storage facility is addressed in Attachment I – Postclosure Plan. Closure activities for the storage and transfer units will be accomplished as outlined below.

- 130 Environmental Park, LLC will remove all waste, waste residues, and any recovered materials from the transfer and storage unit.
- The transfer and storage unit will be dismantled and removed offsite or disposed onsite.
- 130 Environmental Park, LLC will evacuate all materials to an authorized facility.



## 5 CLOSURE COST ESTIMATE

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30 TAC §330.503(a)

The estimated cost of hiring a third party to close the largest area of the landfill requiring final closure at any time during the active life of the unit is \$~~10,116,890.00~~10,121,410.00. The detailed cost estimate is included in Part III, Attachment J – Cost Estimates for Closure and Post Closure Care.



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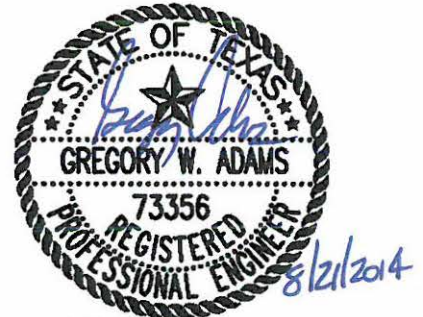
**ATTACHMENT J  
COST ESTIMATES FOR CLOSURE AND POSTCLOSURE CARE**

Prepared for

**130 ENVIRONMENTAL PARK, LLC**

February 2014  
Revised June 2014

Revised August 2014



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### APPENDIX J1

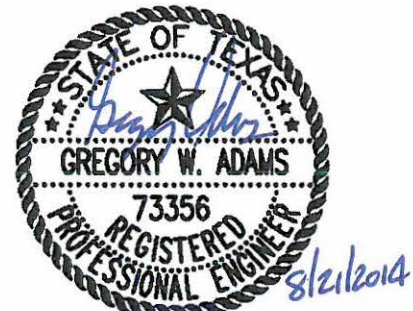
Closure Cost Estimate Calculations

### APPENDIX J2

Postclosure Care Cost Estimate Calculations

### APPENDIX J3

Evidence of Financial Assurance



Biggs & Mathews Environmental, Inc.  
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**Table J-1**  
**Closure Cost Estimate**

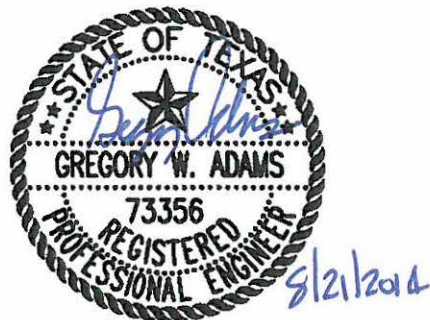
No.	ITEM	COST
<b>1.0</b>	<b>Engineering Costs</b>	
1.1	Topographic Survey	\$ 16,640.00
1.2	Boundary Survey	\$ 9,360.00
1.3	Site Evaluation	\$ 15,600.00
1.4	Development of Plans	\$ 75,000.00
1.5	Administration	\$ 12,000.00
1.6	Inspection and Testing	\$ 412,500.00
1.7	Groundwater Consultant	\$ -
1.8	Permit Compliance Package	\$ 12,000.00
	Engineering Total	\$ 553,100.00
<b>2.0</b>	<b>Construction Costs</b>	
2.1	Final Cover System	
2.1.1	Infiltration Layer	\$ 810,000.00
2.1.2	Flexible Membrane Cover	\$ 1,275,000.00
2.1.3	Drainage Layer	\$ 990,000.00
2.1.4	Cushion Layer	\$ 140,000.00
2.1.5	Erosion Layer	\$ 1,012,500.00
2.1.6	General Fill	\$ 1,692,900.00
2.2	LFG Control System	\$ 1,837,500.00
2.3	Vegetation	\$ 225,000.00
2.4	Site Grading and Drainage	\$ 375,000.00
2.5	Site Fencing and Security	\$ -
2.6	Leachate Collection System	\$ -
2.7	Monitor Wells	\$ -
2.8	Gas Probes	\$ -
2.9	Storage and Transfer Units	
2.9.1	Cleaning, Dismantling and Disposal	\$ 25,000.00
2.9.2	Large Item Storage Area Materials	\$ 7,200.00
2.9.3	Citizen's Convenience Center Materials	\$ 800.00
2.9.4	Used/Scrap Tire Storage Area Materials	\$ 1,000.00
2.9.5	Wood Waste Processing Area Materials	\$ 4,000.00
2.9.6	Truck Wheel Wash Materials	\$ 4,000.00
2.9.7	Reusable Materials Staging Materials	\$ 4,000.00
	Construction Total	\$ 8,403,900.00
	Engineering and Construction Total	\$ 8,957,000.00
	Contingency	\$ 895,700.00
<b>3.0</b>	<b>Administrative Costs</b>	
3.1	Contract Performance Bond	\$ 179,140.00
3.2	TCEQ Contract Admin/Legal Fees	\$ 89,570.00
	Total	\$ 10,121,410.00

\*This closure cost estimate was developed in 2014 dollars.

**130 ENVIRONMENTAL PARK**

**APPENDIX J1**

**CLOSURE COST ESTIMATE CALCULATIONS**



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Includes pages J1-1 through J1-5



## **2.6 Leachate Collection System Completion**

At the time of closure, the leachate collection system will have been installed in existing cells. No additional expenses will be incurred for this item.

## **2.7 Groundwater Monitoring Well Installation**

Groundwater monitoring wells will have been installed during site development. No additional expenses will be incurred for this item.

## **2.8 Landfill Gas Probe Installation**

Landfill gas probes will have been installed during site development. No additional expenses will be incurred for this item.

## **2.9 Storage and Transfer Units**

Materials from the large item storage area, citizen's convenience center, used/scrap tire storage area, wood waste processing area, reusable materials staging area, and truck wheel wash will be disposed at an authorized facility. ~~Materials from the reusable material processing area will be used in the final closure construction.~~ The citizen's convenience center containers will be cleaned. The leachate storage facility will remain on site to collect generated leachate during postclosure conditions.

## **3.0 ADMINISTRATIVE COSTS**

### **3.1 Contract Performance Bond**

The cost of a performance bond is two percent of the total cost of engineering and construction.

### **3.2 TCEQ Administration of Contracts and Legal Fees**

One percent of the total cost of engineering and construction has been included to account for TCEQ administration of contracts and legal fees.

# 130 Environmental Park CLOSURE COST ESTIMATE

**Required:** Estimate the cost to hire a third party to conduct final closure activities.

**References:**

1. Texas Natural Resources Conservation Commission, *Cost Estimate Handbook for Closure and Postclosure Care*, Version 1, August 1993.
2. *2012 RS Means Heavy Construction Cost Data*, 26th Annual Edition.
3. Construction costs from recent similar construction projects and cost estimates from heavy construction contractors.

**Solution:**

Final closure will require construction of final cover over	75 total acres
Final closure will require administrative closure of	520 acres
Final closure will require the installation of	0 monitor wells
Final closure will require the installation of	0 gas probes
Final closure will require the installation of	75 acres of LFG Control System

No.	ITEM	QTY	UNIT	UNIT COST	TOTAL COST
<b>1.0</b>	<b>Engineering Costs</b>				
1.1	Topographic Survey	520	ac	\$ 32.00	\$ 16,640.00
1.2	Boundary Survey	520	ac	\$ 18.00	\$ 9,360.00
1.3	Site Evaluation	520	ac	\$ 30.00	\$ 15,600.00
1.4	Development of Plans	75	ac	\$ 1,000.00	\$ 75,000.00
1.5	Administration	1	LS	\$ 12,000.00	\$ 12,000.00
1.6	Inspection and Testing	75	ac	\$ 5,500.00	\$ 412,500.00
1.7	Groundwater Consultant	0	LS	NA	\$ -
1.8	Permit Compliance Package	1	LS	\$ 12,000.00	\$ 12,000.00
	<b>Engineering Total</b>				<b>\$ 553,100.00</b>
<b>2.0</b>	<b>Construction Costs</b>				
2.1	Final Cover System				
2.1.1	Infiltration Layer	75	ac	\$ 10,800.00	\$ 810,000.00
2.1.2	Flexible Membrane Cover	75	ac	\$ 17,000.00	\$ 1,275,000.00
2.1.3	Drainage Layer	55	ac	\$ 18,000.00	\$ 990,000.00
2.1.4	Cushion Layer	20	ac	\$ 7,000.00	\$ 140,000.00
2.1.5	Erosion Layer	75	ac	\$ 13,500.00	\$ 1,012,500.00
2.1.6	General Fill	594,000	cy	\$ 2.85	\$ 1,692,900.00
2.2	LFG Control System	75	ac	\$ 24,500.00	\$ 1,837,500.00
2.3	Vegetation	75	ac	\$ 3,000.00	\$ 225,000.00
2.4	Site Grading and Drainage	75	ac	\$ 5,000.00	\$ 375,000.00
2.5	Site Fencing and Security	0	ac	NA	\$ -
2.6	Leachate Collection System	0	lf	NA	\$ -
2.7	Monitor Wells	0	ea	NA	\$ -
2.8	Gas Probes	0	ea	NA	\$ -
2.9	Storage and Transfer Units				
2.9.1	Cleaning, Dismantling and Disposal	1	ls	\$ 25,000.00	\$ 25,000.00
2.9.2	Large Item Storage Area Materials	180	tn	\$ 40.00	\$ 7,200.00
2.9.3	Citizen's Convenience Center Materials	20	tn	\$ 40.00	\$ 800.00
2.9.4	Used/Scrap Tire Storage Area Materials	25	tn	\$ 40.00	\$ 1,000.00
2.9.5	Wood Waste Processing Area Materials	100	tn	\$ 40.00	\$ 4,000.00
2.9.6	Truck Wheel Wash Materials	100	tn	\$ 40.00	\$ 4,000.00
2.9.7	Reusable Materials Staging Materials	100	tn	\$ 40.00	\$ 4,000.00
	<b>Construction Total</b>				<b>\$ 8,403,900.00</b>
	<b>Engineering and Construction Total</b>				<b>\$ 8,957,000.00</b>
	Contingency	10	%		\$ 895,700.00
<b>3.0</b>	<b>Administrative Costs</b>				
3.1	Contract Performance Bond	2.0	%		\$ 179,140.00
3.2	TCEQ Contract Admin/Legal Fees	1.0	%		\$ 89,570.00
	<b>Total</b>				<b>\$ 10,121,410.00</b>

\*This closure cost estimate was developed in 2014 dollars.