

**SKYLINE LANDFILL  
CITY OF FERRIS  
DALLAS AND ELLIS COUNTIES, TEXAS  
TCEQ PERMIT APPLICATION NO. MSW 42D**

**PERMIT AMENDMENT APPLICATION**

**PART III – FACILITY INVESTIGATION AND DESIGN  
ATTACHMENT I  
POSTCLOSURE PLAN**

Prepared for

**Waste Management of Texas, Inc.**

April 2012

Revised August 2012



Prepared by

**BIGGS & MATHEWS ENVIRONMENTAL**

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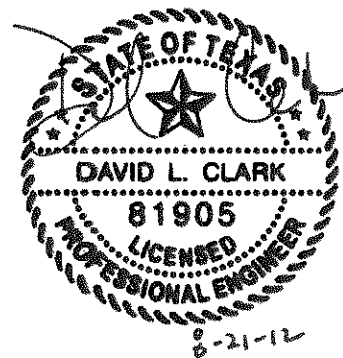
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FIRM REGISTRATION No. 50222

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## 2 POSTCLOSURE CARE ACTIVITIES

30 TAC §330.463(b) and §330.465

### 2.1 Monitoring and Maintenance

~~In accordance with 30 TAC §330.463(b), postclosure care maintenance will commence immediately upon completion of final closure requirements set forth in~~ Following completion of all closure activities for the MSW landfill unit, the owner or operator shall comply with the post-closure care requirements specified in §330.463(b). Closure requirements are included in Part III, Attachment H – Closure Plan. Postclosure care maintenance will continue for a period of 30 years unless the TCEQ approves or requires a postclosure care period of a different duration. Postclosure care maintenance will consist, at a minimum, of the following requirements, to be carried out by Waste Management of Texas, Inc. (WMTX).

- Retain the right of entry and maintain all rights-of-way to the closed landfill.
- Conduct semiannual site inspections.
- Conduct maintenance or remediation activities, as needed, to maintain the integrity and effectiveness of the final cover, site vegetation, and stormwater drainage appurtenances. These activities may include regrading, placement of additional soil, seeding, and repair of erosion control features.
- Control surface runoff and runoff in order to minimize the erosion of the final cover system. Maintenance may include regrading and cleaning of ditches and swales.
- Correct the effects of settlement, subsidence, ponded water, erosion, or other events or failures as these situations are detrimental to the integrity of the closed landfill. Corrective measures may include regrading, placement of additional soil, and seeding.
- Maintain the groundwater monitoring system and monitor groundwater in accordance with the requirements of §§330.401 – 330.421. In accordance with 30 TAC §330.407, the monitoring frequency will be semiannual. Parameters to be monitored will be those constituents listed in 30 TAC §330.419. However, WMTX reserves the right to request TCEQ approval of (1) an alternative monitoring frequency, and (2) an alternative list of parameters to be monitored. Such requests will be based on supporting data available at the time of the request.
- Maintain and operate the leachate collection system in accordance with 30 TAC §330.331 and §330.333. The leachate system will be maintained and operated to limit the leachate depth to less than 30 cm (12 inches) over the liner. Leachate

collected in the sumps and then pumped through a leachate forcemain to a direct connection to a POTW, will be sampled and analyzed per the POTW's requirements. However, WMTX reserves the right to request the approval of the executive director to allow WMTX to stop managing leachate if WMTX can demonstrate to the satisfaction of the executive director that leachate does not pose a threat to human health and the environment.

- Maintain and operate the landfill gas monitoring system in accordance with the requirements of §330.371. In accordance with 30 TAC §330.371, the minimum frequency will be quarterly. However, WMTX reserves the right to request TCEQ approval of an alternate monitoring frequency. Such a request will be based on supporting data available at the time of the request.

## **2.2 Decreasing Postclosure Care Period**

The length of the postclosure care maintenance period may be decreased by the TCEQ if WMTX submits a documented certification, signed by an independent registered professional engineer and including all applicable documentation necessary to support the certification, that demonstrates that the reduced period is sufficient to protect human health and the environment. Applicable documentation may include data from monitoring of groundwater, surface water, leachate levels, and landfill gas. The certified documentation must be reviewed and approved by the TCEQ prior to decreasing the length of the postclosure care maintenance period.

## **2.3 Increasing Postclosure Care Period**

The length of the postclosure care maintenance period may be increased by the TCEQ if it is determined that the increased duration is necessary to protect human health and the environment. It is understood that WMTX will receive appropriate notification of any such proposed changes prior to the TCEQ's final determination.

## **2.4 Completion of Postclosure Care**

Upon completion of the postclosure care maintenance period, WMTX will submit to the TCEQ documented certification signed by an independent licensed professional engineer and verifying that postclosure care maintenance has been completed in accordance with the approved postclosure plan. The submittal will include all documentation necessary for certification of completion of postclosure care maintenance. The certification will be placed in the site operating record upon approval. Certification of completion of the postclosure care maintenance period and voluntary permit revocation will be conducted in accordance with §330.465.

### 3 PERSON RESPONSIBLE FOR CONDUCTING POSTCLOSURE CARE ACTIVITIES

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30 TAC §330.463(b)

At the time of the development of this document, the following person is responsible for the management of this landfill:

Director of ~~Landfill-Disposal~~ Operations  
Waste Management of Texas, Inc.  
~~520 E Corporate Dr., Suite 100~~9708 Giles Rd.  
~~P.O. Box 276~~  
~~Lewisville, Texas 75057~~Austin, Texas 78754  
~~972-316-2269~~512-272-6243

Daily operational activities are directed by:

Landfill Manager  
Skyline Landfill  
1201 N. Central ~~Ave.~~Street  
Ferris, Texas 75125  
972-842-5710

The person responsible for conducting postclosure activities is subject to change. However, as part of the closure notification to TCEQ, as required by 30 TAC §330.463(b), WMTX will notify the TCEQ regarding the responsible person.

**SKYLINE LANDFILL  
CITY OF FERRIS  
DALLAS AND ELLIS COUNTIES, TEXAS  
TCEQ PERMIT APPLICATION NO. MSW 42D**

**PERMIT AMENDMENT APPLICATION**

**PART III – FACILITY INVESTIGATION AND DESIGN  
ATTACHMENT J  
COST ESTIMATES FOR CLOSURE AND POSTCLOSURE CARE**

Prepared for

**Waste Management of Texas, Inc.**

April 2012

Revised August 2012



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## APPENDIX J1

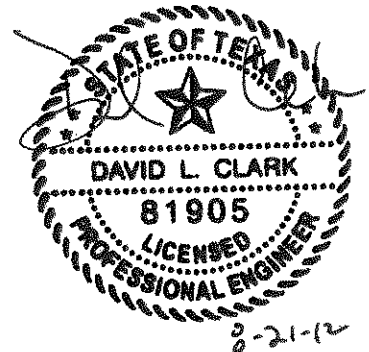
Closure Cost Estimate Calculations  
30 TAC §330.503

## APPENDIX J2

Postclosure Care Cost Estimate Calculations  
30 TAC §330.63(j); §330.507

## APPENDIX J3

Evidence of Financial Assurance  
30 TAC §330.503(b) and Chapter 37, Subchapter R



## LIST OF TABLES AND FIGURES

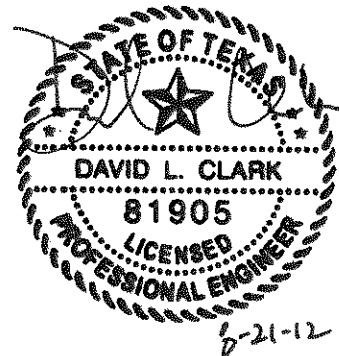
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### TABLES

- J-1 Closure Cost Estimate
- J-2 Postclosure Care Cost Estimate

### DRAWINGS

- J.1 Largest Area Requiring Final Cover





# 1 INTRODUCTION

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30 TAC §330.63(j)

This cost estimate for closure and postclosure care has been prepared for the Skyline Landfill and is consistent with 30 TAC §§330.501 – 330.507.

## 2 CLOSURE COST ESTIMATE

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30 TAC §330.503

This cost estimate shows the cost of hiring a third party to close the largest waste fill area that could potentially be open in the year to follow and those areas that have not received final cover in accordance with the final closure plan, at any time during the active life of the site when the extent and manner of site operations would make closure the most expensive. The largest area ever requiring final cover was determined as approximately 134.4 acres. Final cover has been installed over 20.1 acres in Phase I; TCEQ has accepted the Final Cover System Evaluation Reports for this area. Final cover has been constructed over the entire 68.3-acre pre-Subtitle D area; this final cover has been certified and the reports approved by TCEQ. Refer to Part III, Attachment H, Appedices H4 and H5 for Phase I area and pre Subtitle D area final cover construction documentation.

These areas are illustrated on Drawing J.1. Final cover will be placed over the area shown to require final cover. The closure cost estimate includes the cost for evaluation, design, construction, contract administration, bonds, and legal fees.

Closure activities are outlined in Part III, Attachment H – Closure Plan. This cost estimate, in current dollars, generally follows the outline presented in the TCEQ “Cost Estimate Handbook for Closure and Postclosure Care,” Version 1. A summary of the estimated closure costs is presented on Table J-1. Calculations and supporting data for the closure cost estimate are included in Appendix J1. The cost will be adjusted annually as indicated in Section 4.

## 4 COST ESTIMATE ADJUSTMENTS

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30 TAC §330.503 and §330.507

During the active life of the unit, Waste Management of Texas, Inc. (WMTX) will annually adjust the cost estimates for inflation within 60 days prior to the anniversary date of the establishment of the financial instrument(s). The adjustment may be made by recalculating the maximum costs of closure in current dollars, or by using an inflation factor derived from the most recent *Implicit Price Deflator for Gross National Product* published by the United States Department of Commerce in its Survey of Current Business. The inflation factor is the result of dividing the latest published annual deflator by the deflator for the previous year. The first adjustment is made by multiplying the closure and postclosure care cost estimate by the inflation factor. The result is the adjusted closure and postclosure care cost estimate. Subsequent adjustments are made by multiplying the latest adjusted closure and postclosure care estimate by the latest inflation factor.

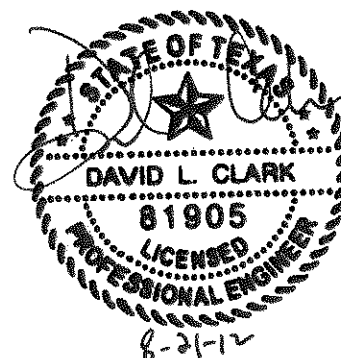
An increase in the closure or postclosure care cost estimate and the amount of financial assurance will be made if changes to the final closure or postclosure care plan or the landfill conditions increase the maximum cost. A request for an increase in the cost estimate and financial assurance will be submitted as a permit modification. The closure and postclosure care cost will be evaluated annually, to determine if an increase in the closure or postclosure care cost is required as a result of continued landfill development.

A reduction in the closure or postclosure care cost estimate and the amount of financial assurance may be requested if the cost estimate exceeds the maximum costs of closure at any time during the remaining life of the unit or postclosure care remaining over the postclosure care period. WMTX will submit written notice to the executive director of the detailed justification for the reduction of the cost estimates and the amount of financial assurance. A request for reduction in the cost estimate and financial assurance will be submitted as a permit modification.

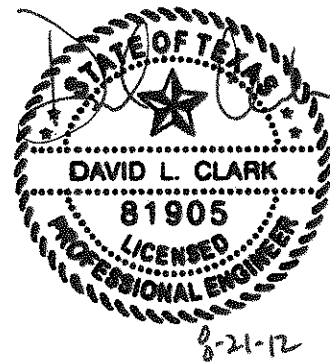
**Table J-1  
Closure Cost Estimate**

<b>No.</b>	<b>ITEM</b>	<b>COST</b>
<b>1.0</b>	<b>Engineering Costs</b>	
1.1	Topographic Survey	\$ 21,184.00
1.2	Boundary Survey	\$ 11,916.00
1.3	Site Evaluation	\$ 19,860.00
1.4	Development of Plans	\$ 134,400.00
1.5	Administration	\$ 11,000.00
1.6	Inspection and Testing	\$ 806,400.00
1.7	Groundwater Consultant	-
1.8	Permit Compliance Package	\$ 11,000.00
	<b>Engineering Total</b>	<b>\$ 1,015,760.00</b>
<b>2.0</b>	<b>Construction Costs</b>	
2.1	Final Cover System	
2.1.1	Infiltration Layer	\$ 1,451,520.00
2.1.2	Drainage Layer	\$ 1,881,600.00
2.1.3	Erosion Layer	\$ 1,814,400.00
2.2	LFG Control System	\$ -
2.3	Vegetation	\$ 336,000.00
2.4	Site Grading and Drainage	\$ 698,880.00
2.5	Site Fencing and Security	\$ -
2.6	Leachate Collection System	\$ -
2.7	Monitor Wells	\$ -
2.8	Gas Probes	\$ -
2.9	Storage and Processing Units	\$ 11,000.00
2.10	Bioremediation Treatment Pad	
2.10.1	Removal of Petroleum Contaminated Soil	\$ 10,000.00
2.10.2	Transportation of Petroleum Contaminated Soil	\$ 24,000.00
2.10.3	Treatment/Disposal of Petroleum Contaminated Soil	\$ 113,750.00
2.10.4	Excavation/On-site Disposal of Treatment Pad	\$ 18,000.00
	<b>Construction Total</b>	<b>\$ 6,359,150.00</b>
	<b>Engineering and Construction Total</b>	<b>\$ 7,374,910.00</b>
	<b>Contingency</b>	<b>\$ 737,491.00</b>
<b>3.0</b>	<b>Administrative Costs</b>	
3.1	Contract Performance Bond	\$ 147,498.20
3.2	TCEQ Contract Admin/Legal Fees	\$ 87,543.50
	<b>Total</b>	<b>\$ 8,347,442.70</b>

\*This closure cost estimate was developed in 2012 dollars.



**SKYLINE LANDFILL**  
**APPENDIX J1**  
**CLOSURE COST ESTIMATE CALCULATIONS**  
**30 TAC §330.503**



Includes pages J1-1 through J1-6

## **2.4 Site Grading and Drainage**

Site grading and drainage includes the final grading at the site, drainage improvements on the landfill cap, and sedimentation controls. The quantity of site grading will depend on the largest area requiring closure.

## **2.5 Site Fencing and Security**

Site fencing and security for the entire landfill exists at the permit boundary. No expenses will be incurred for this item.

## **2.6 Leachate Collection System Completion**

At the time of closure, the LCS will have been installed in existing cells. No 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 groundwater monitoring wells will be required to be installed.

## **2.8 Landfill Gas Probe Installation**

Landfill gas monitoring probes will have been installed during site development. No additional landfill gas monitoring probes will be required to be installed.

## **2.9 Storage and Processing Units**

Storage and processing units at the Skyline Landfill include the large item storage area, reusable materials staging area, citizen's convenience area, bioremediation treatment pad, liquid stabilization area, mud grate facility, and the leachate storage tanks; the closure costs for the bioremediation pad are included in item 2.10 below. All waste materials that are processed or stored will be disposed at the active working face prior to closure. The liquid stabilization basin and citizen's drop-off area containers will be cleaned. The leachate storage tanks will remain on site to collect generated leachate during postclosure conditions.

## **2.10 Bioremediation Treatment Pad**

The bioremediation treatment pad for petroleum contaminated materials is located within the future waste fill area (Phase 3), as shown in Drawing J.1. The treatment pad is constructed with a minimum 18-inch-thick compacted clay liner and is approximately 2.5 acres. In unexpected closure events, the bioremediation treatment pad may have

contaminated soils that have not completed the required bioremediation treatment and need to be disposed of at another facility that has proper authorization. Also, the bioremediation treatment pad may require excavation and on-site disposal. This closure scenario is discussed below.

#### 2.10.1 Removal of Petroleum Contaminated Soil

It is assumed that approximately 2,000 cubic yards of petroleum contaminated soil (estimated 6 inches of soil over the entire 2.5-acre pad area) will be removed from the bioremediation treatment pad and placed in haul trucks for transport. The unit cost used in the cost estimate was based on the cost of operation of this facility and similar facilities.

#### 2.10.2 Transportation of Petroleum Contaminated Soil

The petroleum contaminated soil removed from the bioremediation treatment pad will be transported to a properly permitted facility that has authorization to treat petroleum contaminated soil, and then a properly permitted Type I municipal solid waste disposal facility for disposal. A total haul distance of 100 miles is estimated for transportation costs. The unit cost used in this estimate was based on the use of haul trucks and operator experience.

#### 2.10.3 Disposal of Petroleum Contaminated Soil

The petroleum contaminated soil will be treated at a properly permitted facility and then disposed of at a Type I municipal solid waste disposal facility. The unit cost used in this cost estimate was based on tipping fees at area landfills for an estimated 3,250 tons of soil; the tonnage is determined from the 2,000 cubic yard quantity and estimated soil density of 120 pounds per cubic foot.

#### 2.10.4 Excavation/On-site Disposal of Treatment Pad

The bioremediation treatment pad will be excavated and disposed of at the Skyline Landfill. The quantity of material excavation is based on the pad thickness and area.

### **3.0 ADMINISTRATIVE COSTS**

#### **3.1 Contract Performance Bond**

The cost of a performance bond is based on 2 percent of the total cost of engineering and construction.

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

An amount based on 1 percent of the total cost of engineering and construction has been included to account for TCEQ administration of contracts and legal fees.

## Skyline Landfill 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	134.4 total acres
Final closure will require administrative closure of	662 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	0 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	662	ac	\$ 32.00	\$ 21,184.00
1.2	Boundary Survey	662	ac	\$ 18.00	\$ 11,916.00
1.3	Site Evaluation	662	ac	\$ 30.00	\$ 19,860.00
1.4	Development of Plans	134.4	ac	\$ 1,000.00	\$ 134,400.00
1.5	Administration	1	LS	\$ 11,000.00	\$ 11,000.00
1.6	Inspection and Testing	134.4	ac	\$ 6,000.00	\$ 806,400.00
1.7	Groundwater Consultant	0	LS	-	-
1.8	Permit Compliance Package	1	LS	\$ 11,000.00	\$ 11,000.00
<b>Engineering Total</b>					<b>\$ 1,015,760.00</b>
<b>2.0</b>	<b>Construction Costs</b>				
2.1	Final Cover System				
2.1.1	Infiltration Layer	134.4	ac	\$ 10,800.00	\$ 1,451,520.00
2.1.2	Drainage Layer	134.4	ac	\$ 14,000.00	\$ 1,881,600.00
2.1.3	Erosion Layer	134.4	ac	\$ 13,500.00	\$ 1,814,400.00
2.2	LFG Control System	0	ac	-	-
2.3	Vegetation	134.4	ac	\$ 2,500.00	\$ 336,000.00
2.4	Site Grading and Drainage	134.4	ac	\$ 5,200.00	\$ 698,880.00
2.5	Site Fencing and Security	0	ac	-	-
2.6	Leachate Collection System	0	lf	-	-
2.7	Monitor Wells	0	ea	-	-
2.8	Gas Probes	0	ea	-	-
2.9	Storage and Processing Units	1	LS	\$ 11,000.00	\$ 11,000.00
2.10	Bioremediation Treatment Pad				
2.10.1	Removal of Petroleum Contaminated Soil	1	LS	\$ 10,000.00	\$ 10,000.00
2.10.2	Transportation of Petroleum Contaminated Soil	2,000	cy	\$ 12.00	\$ 24,000.00
2.10.3	Treatment/Disposal of Petroleum Contaminated Soil	3,250	tons	\$ 35.00	\$ 113,750.00
2.10.4	Excavation/On-site Disposal of Treatment Pad	6,000	cy	\$ 3.00	\$ 18,000.00
<b>Construction Total</b>					<b>\$ 6,359,150.00</b>
<b>Engineering and Construction Total</b>					<b>\$ 7,374,910.00</b>
	Contingency	10	%		\$ 737,491.00
<b>3.0</b>	<b>Administrative Costs</b>				
3.1	Contract Performance Bond	2.0	%		\$ 147,498.20
3.2	TCEQ Contract Admin/Legal Fees	1.0	%		\$ 87,543.50
<b>Total</b>					<b>\$ 8,347,442.70</b>

\*This closure cost estimate was developed in 2012 dollars.

