



Closure/Post-Closure Care Cost Estimates

Applicable Rules

MSW: OAC 3745-27-15
OAC 3745-27-16
ISW: OAC 3745-29-15
OAC 3745-29-16
RSW: OAC 3745-30-11
Tires: OAC 3745-27-15
OAC 3745-27-16

Purpose

The purpose of this document is to provide a resource to landfill facility owner/operators and applicants and to district office engineers and inspectors for submitting and reviewing closure and post-closure care costs for landfills.

Applicability

Financial assurance cost estimating forms, provided by DMWM, may be used voluntarily by landfill facility owner/operators and applicants or by district office engineers and inspectors. These forms may be submitted, or used by reviewers, for PTI applications, closure plans, alterations, and financial assurance updates at existing facilities.

Background

Cost estimates for closure and post-closure care are required with PTI applications, closure plans, and some alterations, and are required to be updated annually. Currently when cost estimates are submitted, they are not reported in a consistent manner. This makes it difficult for the applicant to be thorough in identifying the possible closure and post-closure care activities, and it is difficult for DMWM staff to collect data and analyze it, and to make comparisons. The thorough and consistent data is also necessary when DMWM considers future program and rule development to support a simplified "formula" for estimating the closure and post-closure care costs.

DMWM has developed financial assurance cost estimate forms for use by owner/operators and DMWM reviewers. It is anticipated that these forms will be required and become part of the PTI application for new landfills, lateral expansions (new units), vertical expansions above authorized fill area, and for those modifications which will affect financial assurance cost estimates. However, until then, their use is voluntary.

Procedure

To aid applicants and owner/operators in providing a thorough identification of the possible closure and post-closure care activities, they may voluntarily begin using the financial assurance cost estimate forms, attached. These forms consist of a Facility Information Summary, a Closure Costs Summary and a Post-Closure Care Costs Summary, and numerous Detail Worksheets including Cover Sheets.

Contact

If you have questions regarding this document or would like additional information, please contact:

Central District Office DMWM Supervisor (614) 728-3778

Northeast District Office DMWM Supervisor (330) 963-1200

Northwest District Office DMWM Supervisor (419) 352-8461

Southeast District Office DMWM Supervisor (740) 385-8501

Southwest District Office DMWM Supervisor (937) 285-6357

Closure/Post-Closure Care Cost Estimates

Central Office Authorizing Actions and Engineering Unit (614) 644-2621

Disclaimer

This document is intended for guidance purposes only. Completion of the activities and procedures outlined in this document shall not release an owner or operator from any requirement or obligation for complying with Ohio Revised Code (ORC) Chapter 3734 or 3714 if appropriate, the OAC rules adopted thereunder, or any authorizing documents or orders issued thereunder, nor shall it prevent Ohio EPA from pursuing enforcement actions to require compliance with ORC Chapter 3734 or 3714, the OAC rules or any authorizing documents or orders issued thereunder.

STATE OF OHIO

Ohio Environmental Protection Agency - Division of Materials and Waste Management

FACILITY INFORMATION SUMMARY

Date: _____

I. GENERAL INFORMATION:

Facility Name: _____

Permittee (Applicant): _____

Parent Corporation: _____

II. FACILITY INFORMATION:

Type of Landfill: MSW Scrap Tire ISW RSW _____, _____
class type of waste

Total Landfill Acreage: _____
within limits of waste placement

Closure Acreage: _____
maximum area to be capped

III. REASON FOR SUBMITTAL:

New Facility

Existing Facility

Ohio EPA Facility ID #: _____

Annual Update

Closure Costs:

Post-Closure Care Costs:

Last Year's Estimate _____

Last Year's Estimate _____

Inflation Factor _____

Inflation Factor _____

Modification _____

Description

Alteration _____

Date

Other _____

Description

IV. BASIS FOR ESTIMATE

What is basis for the cost estimates: _____

Identify reference guide or other source

Identify the third party providing the closure and post closure estimates: _____

STATE OF OHIO

FACILITY INFORMATION SUMMARY

Estimates must comply with rules OAC 3745-27-15 and 3745-27-16. This includes basing the estimate on the following:

- * the final closure costs at a point in the operating life when the extent and the manner of its operation would make final closure the most expensive
- * the cost for the State of Ohio to direct a third party to complete final closure of the facility and conduct post-closure care.
- * all activities must be completed in accordance with an approved closure plan, other authorizing document, or in accordance with the closure requirements in OAC Chapter 3745-27, 3745-29 or 3745-30 as appropriate.

Costs must be provided for the State of Ohio to direct a third party to provide all material, transportation, labor, and reporting.

The basis of the estimate must be provided. If a cost estimating reference is used, such as Dodge™, Means™, Richardson™, or some other reference guide, the reference must be specified. If the basis of the estimate is a proposal from a third party, that third party must be identified in the cost estimate. If the facility is relying upon the unit costs for labor and materials from this third party, the facility must provide an estimate/quote from the third party which will allow the State of Ohio to obtain these materials and services for the specified unit costs.

All items must be addressed. Attach a detailed explanation for all items marked not applicable (N/A).

STATE OF OHIO

Ohio Environmental Protection Agency - Division of Materials and Waste Management

CLOSURE COSTS SUMMARY

| Activity | | Cost |
|----------|--|------|
| I | Ground Water Monitoring Wells to be installed | \$ |
| II | Slope and Fill (for premature closure) | \$ |
| III | Cap System Components | \$ |
| IV | Permanent Surface Water Structures | \$ |
| V | Explosive Gas Extraction/Control System | \$ |
| VI | Explosive Gas Monitoring System | \$ |
| VII | Site Access Control | \$ |
| VIII | Engineering (QA/QC) | \$ |
| IX | Other Costs | \$ |
| X | Subtotal of Closure Costs (Sum of Lines I to IX) | \$ |
| XI | Administration % of subtotal: | \$ |
| XII | Certification of Closure | \$ |
| XIII | Contingency % of subtotal: | \$ |
| XIV | TOTAL COST OF CLOSURE (Sum of lines X to XIII) | \$ |

STATE OF OHIO

CLOSURE COSTS

Ground Water Monitoring is to include costs of mobilization, well installation including development, and QA/QC including surveying.

Slope and Fill is to include costs of mobilization, transportation, excavation, restoration of borrow areas, placement and compaction, materials testing (field and lab), and QA/QC including surveying.

Cap System Components is to include costs for materials, mobilization, transportation, placement, seeding and mulching, materials testing (field and lab), QA/QC including certification for all components including the gas collection layer, sub-base layer, engineered barrier layer, GCL, FML, drainage layer, filter layer, freeze-thaw protection layer, vegetative layer, and any temporary erosion control.

Permanent Surface Water Structures is to include costs for materials.

Explosive Gas Extraction/Control Systems is to include costs for mobilization, installation, cap restoration, materials, equipment, instrumentation, QA/QC, and certification.

Explosive Gas Monitoring System is to include costs for mobilization, installation/repair/replacement of probes and alarms and QA/QC and certification.

Site Access Control is to include costs for materials.

Engineering (QA/QC) is to include costs for revisions to the closure plan report, designs and calculations, surveying, and benchmark installation.

Other Costs is to include costs for items not otherwise addressed in another section. The Other Costs is also to be identified.

Administration is to include costs for personnel (on-site engineer, project manager, clerical). Certification of Closure is to include costs for items not included in other sections' QA/QC. Contingency is for unanticipated changes that may not be accounted for in the closure cost estimate.

STATE OF OHIO

Ohio Environmental Protection Agency - Division of Materials and Waste Management

POST-CLOSURE CARE COSTS SUMMARY

| | Activity | Cost |
|------|--|------|
| I | Ground Water Monitoring | \$ |
| II | Explosive Gas Migration Monitoring | \$ |
| III | Leachate Monitoring | \$ |
| IV | Surface Water Monitoring | \$ |
| V | Operation and Maintenance of Leachate Collection / Treatment Systems | \$ |
| VI | Operation and Maintenance of Ground Water Monitoring Wells | \$ |
| VII | Operation and Maintenance of Explosive Gas Extraction and/ or Control System | \$ |
| VIII | Operation and Maintenance of Explosive Gas Monitoring System | \$ |
| IX | Utilities for Operation | \$ |
| X | Maintenance of Cover System | \$ |
| XI | Operation and Maintenance of Surface Water Management System | \$ |
| XII | Operation and Maintenance of Access Control Structures | \$ |
| XIII | Subtotal of Post-Closure Costs (Sum of lines I to XII and then multiplied by number of years of post-closure care) | \$ |
| XIV | Administration % of subtotal: | \$ |
| XV | Final Certification Upon Completion of Post-Closure Care Period | \$ |
| XVI | Remedial Costs % of subtotal: | \$ |
| XVII | TOTAL COST OF POST CLOSURE (Add lines XIV to XVI) | \$ |

POST-CLOSURE CARE COSTS

Ground Water Monitoring is to include costs for analyzing parameters including assessment and reporting.

Gas Monitoring is to include costs for sampling and reporting.

Leachate Monitoring is to include costs for analyzing parameters including special constituents and reporting.

Surface Water Monitoring is to include costs for analyzing and reporting.

Operation and Maintenance of Leachate Collection and Treatment System is to include costs for inspection, flushing, cleaning, repair/replacement, sludge removal, sludge characterization, sludge disposal, leachate disposal, and on-site leachate treatment.

Operation and Maintenance of Ground Water Monitoring Wells is to include costs for maintenance and repair/replacement including mobilization, abandonment, installation, development, background sampling and QA/QC and certification.

Operation and Maintenance of Explosive Gas Extraction and/or Control System is to include costs for utilities, emissions monitoring, and repair/replacement including mobilization, abandonment, installation, development, background sampling and QA/QC and certification.

Operations and Maintenance of Gas Monitoring System is to include costs for maintenance and repair/replacement including mobilization, abandonment, installation and QA/QC and certification.

Maintenance of Cover System is to include costs for mowing, repair, and rodent control.

Operation and Maintenance of Surface Water Management System is to include costs for maintaining and repairing ditches, conveyance structures, and ponds/basins.

Operation and Maintenance of Access Control Structures is to include costs for maintaining and repairing/replacing fences, gates, signs and roadways.

Administration is to include costs for personnel (on-site engineer, project manager).

Final Certification of Closure is to include costs for items not included in other sections QA/QC.

Remedial Costs are those costs associated with remedial actions reasonably anticipated to occur during the post closure care period.

Closure Cost Estimate Cover Sheet

| I | Ground Water Monitoring Wells | |
|---|--|--|
| | Item Description | Item Cost |
| a | Ground Water Monitoring Well Installation and Development | ^{1.1} \$ |
| b | Ground Water Monitoring Well System Repair and Replacement | ^{1.2} \$ |
| c | | \$ |
| <i>Subtotal for Ground Water Monitoring Wells</i> | | Insert amount from this box onto line I on Summary Sheet |

| II | Slope and Fill (for premature closure) | | | |
|------------------------------------|--|----------|-----------|---|
| | Item Description | Quantity | Unit Cost | Item Cost |
| a | Mobilization / Demobilization (LS) | | \$ | \$ |
| b | Soil (CY**) | | \$ | \$ |
| c | Excavation (CY) | | \$ | \$ |
| d | Placement/ Spreading (CY) | | \$ | \$ |
| e | Compaction (CY) | | \$ | \$ |
| f | Transportation cost of materials (CY) (transport radius: _____) | | \$ | \$ |
| g | Materials Testing (LS) (field and lab) | | \$ | \$ |
| h | Surveying (LS) | | \$ | \$ |
| i | QA/QC (LS) | | \$ | \$ |
| j | | | \$ | \$ |
| <i>Subtotal for Slope and Fill</i> | | | | Insert amount from this box onto line II on Summary Sheet \$ |

** Note that the actual surface area may be significantly larger than the plan area depicted in the authorizing document. In addition, the volume of soil once compacted, may be different than the volume excavated.

Closure Cost Estimate Cover Sheet

| III | Cap System Components | | |
|---------------------------------------|--|-----------|---|
| | Item Description** | Item Cost | |
| a | Gas Collection Layer | 3.1\$ | |
| b | Sub-Base Layer | 3.2\$ | |
| c | Engineered Barrier Layer | 3.3\$ | |
| d | Geosynthetic Clay Liner | 3.4\$ | |
| e | Flexible Membrane Liner (FML) | 3.5\$ | |
| f | Drainage Layer | 3.6\$ | |
| g | Freeze Thaw Protection Layer | 3.7\$ | |
| h | Vegetative Layer | 3.8\$ | |
| i | Surface Water Control System (on the cap) | 3.9\$ | |
| | Item Description | Quantity | Unit Cost |
| j | Mobilization/Demobilization for Earthwork (LS) | | \$ |
| k | Mobilization/Demobilization for Geosynthetics (LS) | | \$ |
| l | Temporary Erosion Control: Silt Fences (Acre) Straw Bales (Acre) Other Erosion Control (Acre) | | \$ \$ \$ |
| m | | | \$ |
| <i>Subtotal Cap System Components</i> | | | Insert amount from this box onto line III on Summary Sheet \$ |

** Note that the actual surface area may be significantly larger than the plan area depicted in the authorizing document. In addition, the volume of soil once compacted, may be different than the volume excavated.

| IV | Permanent Surface Water Structures (outside limits of waste placement) | |
|--|---|--|
| | Item Description | Item Cost |
| a | Surface Water Control Structures | 4.1\$ |
| b | Surface Water Conveyance Structures | 4.2\$ |
| c | Mobilization/Demobilization | \$ |
| d | | \$ |
| <i>Subtotal Permanent Surface Water Structures</i> | | Insert amount from this box onto line IV on Summary Sheet \$ |

Closure Cost Estimate Cover Sheet

| V | Explosive Gas Extraction and/or Control System | | |
|--|---|--|--|
| | Item Description | Item Cost | |
| a | Extraction Well Installation, Repair, and Replacement | 5.1\$ | |
| b | Collection System Installation, Repair, and Replacement | 5.2\$ | |
| c | Flare System Installation, Repair, and Replacement | 5.3\$ | |
| d | Establishment of Utilities and Supplemental Fuel System | 5.4\$ | |
| e | Special Controls and Conveyance Structures | 5.5\$ | |
| f | Mobilization/Demobilization | \$ | |
| g | QA/QC & Certification | \$ | |
| h | | \$ | |
| <i>Subtotal Explosive Gas Extraction and/or Control System</i> | | Insert amount from this box onto line V on Summary Sheet \$ | |

| VI | Explosive Gas Monitoring System | | |
|---|--|---|--|
| | Item Description | Item Cost | |
| a | Gas Monitoring Probe Installation, Repair, and Replacement | 6.1\$ | |
| b | Alarm Installation and Replacement | 6.2\$ | |
| c | | \$ | |
| <i>Subtotal Explosive Gas Monitoring System</i> | | Insert amount from this box onto line VI on Summary Sheet \$ | |

| VII | Access Control | | | |
|--------------------------------|-----------------------|----------|-----------|--|
| | Item Description | Quantity | Unit Cost | Item Cost |
| a | Fencing (LF) | | \$ | \$ |
| b | Gate (EA) | | \$ | \$ |
| c | Sign (EA) | | \$ | \$ |
| d | | | \$ | \$ |
| <i>Subtotal Access Control</i> | | | | Insert amount from this box onto line VII on Summary Sheet \$ |

Closure Cost Estimate Cover Sheet

| VIII | Engineering (QA/QC) | | | |
|-----------------------------|--|----------|-----------|---|
| | Item Description | Quantity | Unit Cost | Item Cost |
| a | Revisions to Closure Plan Report (LS) | | \$ | \$ |
| b | Certified engineering designs and calculations for construction (LS) | | \$ | \$ |
| c | Surveying (Acre) | | \$ | \$ |
| d | Benchmark Installation (EA) | | \$ | \$ |
| e | Benchmark Survey (EA) | | \$ | \$ |
| f | | | \$ | \$ |
| <i>Subtotal Engineering</i> | | | | Insert amount from this box onto line VIII on Summary Sheet \$ |

| IX | Other Costs List all other costs not included in other sections | | | |
|-------------------------------------|---|----------|-----------|---|
| | Item Description | Quantity | Unit Cost | Item Cost |
| a | Environmental Monitoring (LS) | | | ^{9.1} \$ |
| b | Utilities (LS) | | | ^{9.2} \$ |
| c | Restoration of Borrow Areas (Acre) | | \$ | \$ |
| d | | | \$ | \$ |
| <i>Subtotal Site Specific Costs</i> | | | | Insert amount from this box onto line IX on Summary Sheet \$ |

Closure Detail
Section I: Ground Water Monitoring Wells

Detail Worksheet 1.1
Ground Water Monitoring Well Installation and Development

Monitoring Well System Detail

| | |
|------------------------------------|---|
| Number of Wells to Install: | |
| Construction: | PVC <input type="checkbox"/> Other <input type="checkbox"/> |

Monitoring Well System Summary

| | | | |
|----------------------------------|----------|----------|----------|
| Well Depth (ft) | Maximum: | Minimum: | Average: |
| Well Screen Interval (ft) | Maximum: | Minimum: | Average: |
| Boring & Coring (ft) | Maximum: | Minimum: | Average: |
| Well Diameter (inches) | Maximum: | Minimum: | Average: |

Well Repair and Replacement (Per well basis, based on maximum well depth/diameter)

| | Item | Unit Cost | Item Cost |
|---|---|-----------|-----------|
| 1 | Mobilization / Demobilization (LS) | \$ | \$ |
| 2 | Well Installation (includes equipment, labor, and materials) (EA) | \$ | \$ |
| 3 | Well Development (EA) | \$ | \$ |
| 4 | Background Sampling (EA) <small>See Post Closure Detail Worksheet 1.6</small> | \$ | \$ |
| Total Closure Cost for Detail Worksheet 1.1* | | | \$ |

***Insert Cost for Detail Worksheet 1.1 onto Closure Cost Estimate Cover Sheet, Section I, line a.**

Section I: Ground Water Monitoring Wells

**Detail Worksheet 1.2
Ground Water Monitoring Well System Replacement and Abandonment**

Monitoring Well System Detail

| | |
|------------------------------------|---|
| Number of Wells to Install: | |
| Construction: | PVC <input type="checkbox"/> Other <input type="checkbox"/> |

Monitoring Well System Summary

| | | | |
|----------------------------------|----------|----------|----------|
| Well Depth (ft) | Maximum: | Minimum: | Average: |
| Well Screen Interval (ft) | Maximum: | Minimum: | Average: |
| Boring & Coring (ft) | Maximum: | Minimum: | Average: |
| Well Diameter (inches) | Maximum: | Minimum: | Average: |

Well Repair and Replacement (Per well basis, based on maximum well depth/diameter)

| | Item | Unit Cost | Item Cost |
|---|---|------------------|------------------|
| 1 | Mobilization / Demobilization (LS) | \$ | \$ |
| 2 | Old Well Removal & Abandonment (EA) | \$ | \$ |
| 3 | Well Installation (includes equipment, labor, and materials) (EA) | \$ | \$ |
| 4 | Well Development (EA) | \$ | \$ |
| 5 | Background Sampling (EA) <small>See Post Closure Detail Worksheet 1.6</small> | \$ | \$ |
| 6 | QA/QC & Certification (EA) | \$ | \$ |
| Total Closure Cost for Detail Worksheet 1.2* | | | \$ |

***Insert Cost for Detail Worksheet 1.2 onto Closure Cost Estimate Cover Sheet, Section I, line b.**

Section III: Cap System Components

**Detail Worksheet 3.1
Gas Collection Layer**

Closure Acreage: _____

Materials Specified for Construction

| Material Type | Material Type (Please Specify) | Transport Radius (off site materials) |
|----------------------|-----------------------------------|--|
| Natural Materials: | | |
| Synthetic Materials: | | |

Material Purchase, Transport, Placement, and Certification

| | Item | Quantity | Unit Cost | Item Cost |
|---|--|----------|-----------|-----------|
| 1 | Material Cost (CY or SY) | | \$ | \$ |
| 2 | Excavation (CY) | | \$ | \$ |
| 3 | Transportation (CY) | | \$ | \$ |
| 4 | Placement (CY) | | \$ | \$ |
| 5 | Testing and Qualification (Field) (LS) | | \$ | \$ |
| 6 | Testing and Qualification (Lab) (LS) | | \$ | \$ |
| 7 | Certification (LS) | | \$ | \$ |
| Total cost for Closure Care Detail Worksheet 3.1** | | | | \$ |

****Insert Cost for Detail Worksheet 3.1 onto Closure Cost Estimate Cover Sheet, Section III, line a.**

Section III: Cap System Components

**Detail Worksheet 3.2
Sub-Base Layer**

Closure Acreage: _____

Materials Specified for Construction

| Material Type | Material Type (Please Specify) | Transport Radius (off site materials) |
|----------------------|-----------------------------------|--|
| Natural Materials: | | |
| Synthetic Materials: | | |

Material Purchase, Transport, Placement, and Certification

| | Item | Quantity | Unit Cost | Item Cost |
|--|--|----------|-----------|-----------|
| 1 | Material (CY) | | \$ | \$ |
| 2 | Excavation (CY) | | \$ | \$ |
| 3 | Transportation (CY) | | \$ | \$ |
| 4 | Placement (CY) | | \$ | \$ |
| 5 | Testing and Qualification (Field) (LS) | | \$ | \$ |
| 6 | Testing and Qualification (Lab) (LS) | | \$ | \$ |
| 7 | Certification (LS) | | \$ | \$ |
| Total Closure Cost for Detail Worksheet 3.2** | | | | \$ |

****Insert Cost for Detail Worksheet 3.2 onto Closure Cost Estimate Cover Sheet, Section III, line b.**

Section III: Cap System Components

**Detail Worksheet 3.3
Engineered Barrier Layer**

Closure Acreage: _____

Materials Specified for Construction

| Material Type | Material Type (Please Specify) | Transport Radius (off site materials) |
|-----------------------------|--|--|
| Natural Materials: | <input type="checkbox"/> 18 inches of 10 ⁻⁶ cm/s <input type="checkbox"/> 24 inches of 10 ⁻⁷ cm/s | |
| Synthetic Materials: | | |

Material Purchase, Transport, Placement, and Certification

| | Item | Quantity | Unit Cost | Item Cost |
|--|--|----------|-----------|-----------|
| 1 | Material (CY) | | \$ | \$ |
| 2 | Excavation (CY) | | \$ | \$ |
| 3 | Transportation (CY) | | \$ | \$ |
| 4 | Placement (CY) | | \$ | \$ |
| 5 | Testing and Qualification (Field) (LS) | | \$ | \$ |
| 6 | Testing and Qualification (Lab) (LS) | | \$ | \$ |
| 7 | Certification (LS) | | \$ | \$ |
| Total Closure Cost for Detail Worksheet 3.3** | | | | \$ |

****Insert Cost for Detail Worksheet 3.3 onto Closure Cost Estimate Cover Sheet, Section III, line c.**

Closure Detail
Section III: Cap System Components

Detail Worksheet 3.4
Geosynthetic Clay Liner (GCL) Layer

Closure Acreage: _____

Materials Specified for Construction

| GCL Brand | GCL Thickness (Please Specify) | Transport Radius |
|-----------|-----------------------------------|------------------|
| | | |
| | | |

Material Purchase, Transport and Installation

| | Item | Quantity | Unit Cost | Item Cost |
|---|--|----------|-----------|-----------|
| 1 | Material (SY) | | \$ | \$ |
| 2 | Transportation (SY) | | \$ | \$ |
| 3 | Placement and Installation (SY) | | \$ | \$ |
| 4 | Testing and Qualification (Field) (LS) | | \$ | \$ |
| 5 | Testing and Qualification (Lab) (LS) | | \$ | \$ |
| 6 | Certification (LS) | | \$ | \$ |
| Total Closure Cost for Detail Worksheet 3.4* | | | | \$ |

***Insert Cost for Detail Worksheet 3.4 onto Closure Cost Estimate Cover Sheet, Section III, line d.**

Closure Detail
Section III: Cap System Components

Detail Worksheet 3.5
Flexible Membrane Liner (FML) Layer

Closure Acreage: _____

Materials Specified for Construction

| FML Brand | FML Type & Thickness | Transport Radius |
|-----------|----------------------|------------------|
| | | |
| | | |

Material Purchase, Transport and Installation

| | Item | Quantity | Unit Cost | Item Cost |
|---|--|----------|-----------|-----------|
| 1 | Material(SY) | | \$ | \$ |
| 2 | Transportation (SY) | | \$ | \$ |
| 3 | Placement and Installation (SY) | | \$ | \$ |
| 4 | Testing and Qualification (Field) (LS) | | \$ | \$ |
| 5 | Testing and Qualification (Lab) (LS) | | \$ | \$ |
| 6 | Certification (LS) | | \$ | \$ |
| Total Closure Cost for Detail Worksheet 3.5* | | | | \$ |

***Insert Cost for Detail Worksheet 3.5 onto Closure Cost Estimate Cover Sheet, Section III, line e.**

Section III: Cap System Components

Detail Worksheet 3.6 Drainage Layer

Specify materials to be used as part of the drainage layer

| | |
|----------------------------|--|
| Drainage Layer composition | <input type="checkbox"/> Sand, acreage _____ <input type="checkbox"/> Geonet, acreage _____ <input type="checkbox"/> Filter Fabric, acreage _____ <input type="checkbox"/> Other _____, acreage _____ |
|----------------------------|--|

Sand Component

Materials Specified for Construction

| Soils Used | Transport Radius (off site materials) |
|------------|--|
| | |

| | Item | Quantity | Unit Cost | Item Cost |
|---|--|----------|-----------|---|
| 1 | Material (CY) | | \$ | \$ |
| 2 | Excavation (CY) | | \$ | \$ |
| 3 | Transportation Cost (CY) | | \$ | \$ |
| 4 | Placement Cost (CY) | | \$ | \$ |
| 5 | Testing / Qualification Cost (<i>LAB ONLY</i>) (<i>LS</i>) | | \$ | \$ |
| | Subtotal Sand Component | | | \$ |
| | | | | Add to Summary Section of this worksheet (Line 14) |
| | | | | \$ |

Geonet Component

Brand of Geonet: _____

| | Item | Quantity | Unit Cost | Item Cost |
|---|---|----------|-----------|---|
| 6 | Material (SY) | | \$ | \$ |
| 7 | Transportation (SY) | | \$ | \$ |
| 8 | Placement (SY) | | \$ | \$ |
| 9 | Testing/Qualification (<i>LAB ONLY</i>) (<i>LS</i>) | | \$ | \$ |
| | Subtotal Geonet Component | | | \$ |
| | | | | Add to Summary Section of this worksheet (Line 15) |
| | | | | \$ |

Section III: Cap System Components

**Detail Worksheet 3.6
Drainage Layer**

| Filter Fabric Component | | Brand of Filter Fabric | | |
|--------------------------------|--|-------------------------------|------------------|--|
| | Item | Quantity | Unit Cost | Item Cost |
| 10 | Material (SY) | | \$ | \$ |
| 11 | Transportation (SY) | | \$ | \$ |
| 12 | Placement (SY) | | \$ | \$ |
| 13 | Testing/Qualification Cost (<i>LAB ONLY</i>) (<i>LS</i>) | | \$ | \$ |
| Subtotal Filter Fabric | | | | Add to Summary Section of this worksheet (Line 16) \$ |

Detail Worksheet Summary

| | | |
|---|---|----|
| 14 | Sand Component (Subtotal from this detail worksheet) | \$ |
| 15 | Geonet Component (Subtotal from this detail worksheet) | \$ |
| 16 | Filter Fabric Component (Subtotal from this detail worksheet) | \$ |
| 17 | Certification (LS) | \$ |
| Total Closure Cost for Closure Care Detail Worksheet 3.6** | | |

****Insert Cost for Detail Worksheet 3.6 onto Closure Cost Estimate Cover Sheet, Section III, line f.**

Closure Detail Worksheet
Section III: Cap System

Detail Worksheet

Freeze Thaw Protection Layer

Closure Acreage: _____

Materials Specified for Construction

| Material Type | Material Type (Please Specify) | Transport Radius (off site materials) |
|----------------------|-----------------------------------|--|
| Natural Materials: | | |
| Synthetic Materials: | | |

Material Purchase, Transport, Placement, and Certification

| | Item | Quantity | Unit Cost | Item Cost |
|--|--------------------------------------|----------|-----------|-----------|
| 1 | Material Cost (CY or SY) | | \$ | \$ |
| 2 | Excavation (CY or SY) | | \$ | \$ |
| 3 | Transportation (CY or SY) | | \$ | \$ |
| 4 | Placement (CY or SY) | | \$ | \$ |
| 5 | Testing and Qualification (Lab) (LS) | | \$ | \$ |
| 6 | Certification (LS) | | \$ | \$ |
| Total Closure Cost for Detail Worksheet 3.7** | | | | \$ |

****Insert Cost for Detail Worksheet 3.7 onto Closure Cost Estimate Cover Sheet, Section III, line g.**

Closure Detail Worksheet
Section III: Cap System Components
Section III: Cap System

Detail Worksheet
Detail Worksheet
3.8 Vegetative Layer

Closure Acreage: _____

Materials Specified for Construction

| | |
|-------------------|--|
| Soils Used | Transport Radius (off site materials) |
| | |

Seeding and Mulching Vegetative Layer

Applications:

| | |
|------------------|--|
| Operation | Type (Specify) |
| Seeding | <input type="checkbox"/> Hydroseeding <input type="checkbox"/> Spreader <input type="checkbox"/> Other _____ |
| Mulching | <input type="checkbox"/> Compost: Class ____ <input type="checkbox"/> Straw <input type="checkbox"/> Other _____ |
| Fertilizer | |

Material Purchase, Transport, Placement, and Certification

| | Item | Quantity | Unit Cost | Item Cost |
|--|---------------------|----------|-----------|-----------|
| 1 | Material (CY) | | \$ | \$ |
| 2 | Excavation (CY) | | \$ | \$ |
| 3 | Transportation (CY) | | \$ | \$ |
| 4 | Placement (CY) | | \$ | \$ |
| 5 | Seeding (Acre) | | \$ | \$ |
| 6 | Fertilizer (Acre) | | \$ | \$ |
| 7 | Mulching (Acre) | | \$ | \$ |
| Total Closure Cost for Detail Worksheet 3.8** | | | | \$ |

****Insert Cost for Detail Worksheet 3.8 onto Closure Cost Estimate Cover Sheet, Section III, line h.**

Closure Detail
Section III: Cap System Components

Detail Worksheet 3.9
Surface Water Control Structures (on the cap)

Materials Specified for Construction

| | |
|-------------------|--|
| Soils Used | Transport Radius (off site materials) |
| | |

Material Purchase, Transport, Placement, and Certification

| | Item | Quantity | Unit Cost | Item Cost |
|--|----------------------------------|-----------------|------------------|------------------|
| 1 | Material (CY) | | \$ | \$ |
| 2 | Excavation (CY) | | \$ | \$ |
| 3 | Transportation (CY) | | \$ | \$ |
| 4 | Placement (CY) | | \$ | \$ |
| 5 | Water Conveyance Structures (LF) | | \$ | \$ |
| 6 | Rip Rap (CY) | | \$ | \$ |
| 7 | Concrete (CY) | | \$ | \$ |
| 8 | Erosion Fabrics (SY) | | \$ | \$ |
| Total Closure Cost for Detail Worksheet 3.9** | | | | \$ |

**** Insert Cost for Detail Worksheet 3.9 onto Closure Cost Estimate Cover Sheet, Section III, line i.**

Closure Detail
Section IV: Permanent Surface Water Control System

Detail Worksheet 4.1

Permanent Surface Water Control Structures (*outside* Limits of Waste Placement)

Control Structure

| | |
|---|--|
| Type of Structure (Check all that apply) | <input type="checkbox"/> Sedimentation Basin (Size in acres): _____ <input type="checkbox"/> Retention Basin (Size in acres): _____ <input type="checkbox"/> Other (Please Specify): _____ |
|---|--|

Materials Specified for Construction

| Soils Used | Transport Radius (off site materials) |
|------------|--|
| | |

Material Purchase, Transport, Placement, and Certification

| | Item | Quantity | Unit Cost | Item Cost |
|--|----------------------------|----------|-----------|-----------|
| 1 | Soils (CY) | | \$ | \$ |
| 2 | Excavation (CY) | | \$ | \$ |
| 3 | Transportation (CY) | | \$ | \$ |
| 4 | Placement (CY) | | \$ | \$ |
| 5 | Outlet Structures (EA) | | \$ | \$ |
| 6 | FML (SY) | | \$ | \$ |
| 7 | Rip Rap (CY) | | \$ | \$ |
| 8 | Concrete (CY) | | \$ | \$ |
| 9 | Erosion Fabrics (SY) | | \$ | \$ |
| 10 | QA/QC & Certification (LS) | | \$ | \$ |
| Total Closure Cost for Detail Worksheet 4.1** | | | | \$ |

**** Insert Cost for Detail Worksheet 4.1 onto Closure Cost Estimate Cover Sheet, Section IV, line a.**

Section IV: Permanent Surface Water Control System

Detail Worksheet 4.2

Permanent Surface Water Conveyance Structures (*outside* Limits of Waste Placement)

Conveyance Structure

| | |
|---|---|
| Type of Structure (Check all that apply) | <input type="checkbox"/> Channels (specify size and length): _____ <input type="checkbox"/> Drop Structures (specify number): _____ <input type="checkbox"/> Berms (specify size and length): _____ <input type="checkbox"/> Other (Please Specify): _____ |
|---|---|

Materials Specified for Construction

| Soils Used | Transport Radius (off site materials) |
|------------|--|
| | |

Material Purchase, Transport, Placement, and Certification

| | Item | Quantity | Unit Cost | Item Cost |
|--|----------------------------------|----------|-----------|-----------|
| 1 | Soils (CY) | | \$ | \$ |
| 2 | Excavation (CY) | | \$ | \$ |
| 3 | Transportation (CY) | | \$ | \$ |
| 4 | Placement (CY) | | \$ | \$ |
| 5 | Water Conveyance Structures (LF) | | \$ | \$ |
| 6 | FML (SY) | | \$ | \$ |
| 7 | Rip Rap (CY) | | \$ | \$ |
| 8 | Concrete (CY) | | \$ | \$ |
| 9 | Erosion Fabrics (SY) | | \$ | \$ |
| 10 | QA/QC & Certification (LS) | | \$ | \$ |
| Total Closure Cost for Detail Worksheet 4.2** | | | | \$ |

**** Insert Cost for Detail Worksheet 4.2 onto Closure Cost Estimate Cover Sheet, Section IV, line b.**

Closure Detail
Section V: Explosive Gas Extraction and/ or Control System

Detail Worksheet 5.1
Extraction Well Installation, Repair & Replacement

Monitoring Well System Detail

| | |
|--|---|
| Number of Extraction Wells at Site: _____ | Number of extraction Wells to Repair or Replace at Closure**: _____ |
| Construction: | PVC <input type="checkbox"/> Other (Specify) _____ <input type="checkbox"/> |

Monitoring Well System Summary

| | | | |
|----------------------------------|----------|----------|----------|
| Well Depth (ft) | Maximum: | Minimum: | Average: |
| Well Screen Interval (ft) | Maximum: | Minimum: | Average: |
| Gravel Pack Diameter (ft) | Maximum: | Minimum: | Average: |
| Well Diameter (inches) | Maximum: | Minimum: | Average: |

Well Repair and Replacement (Per well basis, based upon maximum depth and diameter)

| | Item | Quantity | Unit Cost | Item Cost |
|---|-------------------------------------|----------|-----------|-----------|
| 1 | Old Well Abandonment & Removal (EA) | | \$ | \$ |
| 2 | Well Installation (EA) | | \$ | \$ |
| 3 | Well Development & Balancing (LS) | | \$ | \$ |
| 4 | Geomembrane Boot Installation (EA) | | \$ | \$ |
| 5 | Cap Repair (LS) | | \$ | \$ |
| 6 | Valves and Fittings (EA) | | \$ | \$ |
| Total Closure Cost for Detail Worksheet 5.1* | | | | \$ |

* Insert Cost for Detail Worksheet 5.1 onto Closure Cost Estimate Cover Sheet Section V, line a.

** For existing systems, assume that a minimum of two (2) percent of existing wells will need replacement during closure.

Closure Detail
Section V: Explosive Gas Extraction and/ or Control System

Detail Worksheet 5.2
Collection System Installation, Repair & Replacement

Collection System Summary

| | |
|---|---|
| Collection System Above Grade (LF) | |
| Collection System Below Grade (LF) | |
| Valves | Number: _____ |
| Construction: | PVC <input type="checkbox"/> Other (Specify) _____ <input type="checkbox"/> |

| | | | |
|--|----------|----------|----------|
| Piping Depth (ft) | Maximum: | Minimum: | Average: |
| Collection Piping Diameter (ft) | Maximum: | Minimum: | Average: |

Collection System Repair and Replacement

| | Item | Quantity | Unit Cost | Item Cost |
|---|-------------------------------------|----------|-----------|-----------|
| 1 | Collection System Piping | | | |
| 2 | Abandonment & Removal (EA) | | | |
| 3 | Header Piping Installation (EA) | | | |
| 4 | System Development & Balancing (LS) | | | |
| 5 | Condensate Pumps (EA) | | | |
| 6 | Sump Pump Replacement (EA) | | | |
| 7 | Condensate Tanks/Storage (EA) | | | |
| 8 | Cap Repair (LS) | | | |
| 9 | Valves and Fittings (LS) | | | |
| Total Closure Cost for Detail Worksheet 5.2* | | | | \$ |

*** Insert Cost for Detail Worksheet 5.2 onto Closure Estimate Cover Sheet Section V, line b.**

Section V: Explosive Gas Extraction and/ or Control System

Detail Worksheet 5.3

Flare System Installation, Repair & Replacement

| | |
|---|---------------------------|
| Size of Flare System (Rated Capacity (MCF/HR): | |
| Number of Flares: | |
| Flare Air Permit Number: | |
| Type of Flare: | |
| Blowers: | Number: _____ Type: _____ |
| Motors: | Number: _____ Type: _____ |
| Rated Capacity (SCFM): | |
| Rated Capacity (HP): | |

Flare System Installation, Repair & Replacement (Based on maximum component size and capacity)

| | Item | Quantity | Unit Cost | Item Cost |
|---|-------------------------------------|-----------------|------------------|------------------|
| 1 | Flow Meter (EA) | | \$ | \$ |
| 2 | Blower (EA) | | \$ | \$ |
| 3 | Motor (EA) | | \$ | \$ |
| 4 | Flame Arrester (EA) | | \$ | \$ |
| 5 | Mist Eliminator / Knockout Pot (EA) | | \$ | \$ |
| 6 | Flare Assembly (EA) | | \$ | \$ |
| 7 | Valves and Fittings (EA) | | \$ | \$ |
| 8 | Instrumentation (LS) | | \$ | \$ |
| Total Closure Cost for Detail Worksheet 5.3* | | | | \$ |

***Insert cost for detail worksheet 5.3 onto Closure Cost Estimate Cover Sheet Section V, line c.**

Closure Detail
Section V: Explosive Gas Extraction and/ or Control System

Detail Worksheet 5.4

Establishment of Utilities & Supplemental Fuel System for Explosive Gas System

Establishment of Specific Utilities at Closure

| | Item | Quantity | Unit Cost | Item Cost |
|---|---|----------|-----------|---|
| 1 | Establishment of Electrical Service (LS) | | \$ | \$ |
| 2 | Establishment of Natural Gas Service (LS) | | \$ | \$ |
| 3 | Establishment of Other Utilities (LS) (specify): | | \$ | \$ |
| Total Closure Cost for Establishment of Utilities: | | | | \$ Box A |

Specifications of Supplemental Fuel System

| | |
|---|--|
| Number of Systems Required for Facility | |
| Size and Number of Fuel Tanks per System | |
| Fuel Type and Source | |
| Fuel System Rating (BTUs / hr) | |

Components of Supplemental Fuel System

| | Item | Quantity | Unit Cost | Item Cost |
|--|-------------------------------------|----------|-----------|---|
| 1 | Fuel Tanks (EA) | | \$ | \$ |
| 2 | Concrete Pads for Tank Systems (EA) | | \$ | \$ |
| 3 | Valves & Fittings (EA) | | \$ | \$ |
| 4 | Pumps (EA) | | \$ | \$ |
| 5 | Instrumentation (LS) | | \$ | \$ |
| Total Cost for Supplemental Fuel System | | | | \$ Box B |
| Total Closure Cost for Detail Worksheet 5.4 (Sum of Box A and Box B)* | | | | \$ |

*** Insert cost for detail worksheet 5.4 onto Closure Cost Estimate Cover Sheet Section V, line d.**

Closure Detail
Section V: Explosive Gas Extraction and/ or Control System

Detail Worksheet 5.5
Special Controls and Conveyance Structures

Description of Special Controls and Conveyance Structures - For informational purposes

Include a description of any systems included in the beneficial use of landfill gases which is integral to landfill operations during closure and post-closure care. Examples include on-site electrical generation and leachate evaporation. Specific components will be site-specific. Include only those systems which are necessary to operate mechanical systems essential to the proper operations of the landfill. Systems which provide revenue opportunities should not be included.

Components of Special Controls and Conveyance Structures

| | Item | Quantity | Unit Cost | Item Cost |
|---|----------------------------------|----------|-----------|-----------|
| 1 | Mobilization/Demobilization (LS) | | \$ | \$ |
| 2 | Materials | | \$ | \$ |
| 3 | Installation | | \$ | \$ |
| 4 | Repair & Replacement | | \$ | \$ |
| 5 | QA/QC & Certification (LS) | | \$ | \$ |
| 6 | | | \$ | \$ |
| 7 | | | \$ | \$ |
| 8 | | | \$ | \$ |
| 9 | | | \$ | \$ |
| 10 | | | \$ | \$ |
| Total Closure Cost for Detail Worksheet 5.5* | | | | \$ |

***Insert cost for detail worksheet 5.5 onto Closure Cost Estimate Cover Sheet Section V, line e.**

Closure Detail
Section VI: Explosive Gas Monitoring System

Detail Worksheet 6.1
Monitoring Probe Installation, Repair and Replacement

Monitoring Probe System Summary

| | |
|---|--------------------|
| Number of Monitoring Probes at Site: | |
| Construction: | PVC 9 Other 9 |

| | | | |
|-----------------------------------|----------|----------|----------|
| Probe Depth (ft) | Maximum: | Minimum: | Average: |
| Probe Screen Interval (ft) | Maximum: | Minimum: | Average: |
| Gravel Pack Diameter (ft) | Maximum: | Minimum: | Average: |
| Probe Diameter (inches) | Maximum: | Minimum: | Average: |

Probe Installation, Repair and Replacement (Per Probe basis, based upon maximum depth and diameter)

| | Item | Quantity | Unit Cost | Item Cost |
|--|--------------------------------------|----------|-----------|-----------|
| 1 | Mobilization / Demobilization (LS) | | \$ | \$ |
| 2 | Old Probe Abandonment & Removal (EA) | | \$ | \$ |
| 3 | Probe Installation (EA) | | \$ | \$ |
| 4 | QA/QC & Certification (LS) | | \$ | \$ |
| Total Closure Cost for Detail Worksheet 6.1 * | | | | \$ |

***Insert cost for detail worksheet 6.1 onto Closure Cost Estimate Cover Sheet Section VI, line a.**

Section VI: Explosive Gas Monitoring System

**Detail Worksheet 6.2
Alarm Installation and Replacement**

| | |
|----------------------------------|--|
| Number of Alarms at Site: | |
|----------------------------------|--|

| | Item | Quantity | Unit Cost | Item Cost |
|---|--|-----------------|------------------|------------------|
| 1 | Mobilization / Demobilization (LS) | | \$ | \$ |
| 2 | Alarm Installation or Replacement (EA) | | \$ | \$ |
| 3 | QA/QC & Certification (LS) | | \$ | \$ |
| Total Closure Cost for Detail Worksheet 6.2* | | | | \$ |

***Insert cost for detail worksheet 6.2 onto Closure Cost Estimate Cover Sheet Section VI, line b.**

Section IX: Other Costs

**Detail Worksheet 9.1
Environmental Monitoring**

| | |
|---|--|
| Anticipated time to complete Closure Activities: | |
|---|--|

| | Item | Number of Monitoring Events | Annual Cost | Pro-rated Cost |
|---|--------------------------|------------------------------------|---|-----------------------|
| 1 | Ground Water Monitoring | | from post-closure cost estimate worksheet section I | |
| 2 | Gas Monitoring | | unit cost from post-closure cost estimate worksheet section II multiplied by 12 | |
| 3 | Leachate Monitoring | | from post-closure cost estimate worksheet section III | |
| 4 | Surface Water Monitoring | | from post-closure cost estimate worksheet section IV | |
| 5 | | | | |
| Total Closure Cost for Detail Worksheet 9.1* | | | | \$ |

***Insert cost for detail worksheet 9.1 onto Closure Cost Estimate Cover Sheet Section IX, line a.**

**Detail Worksheet 9.2
Utilities**

| | Item | Amount | Annual Cost | Pro-rated Cost |
|---|-------------|---------------|--|-----------------------|
| 1 | Electricity | | from post-closure cost estimate cover sheet section IX | |
| 2 | Natural Gas | | from post-closure cost estimate worksheet section II | |
| 3 | Propane | | from post-closure cost estimate worksheet section III | |
| 4 | | | | |
| Total Closure Cost for Detail Worksheet 9.2* | | | | \$ |

***Insert cost for detail worksheet 9.2 onto Closure Cost Estimate Cover Sheet Section IX, line b.**

Post Closure Cost Estimate Cover Sheet

| I | Ground Water Monitoring | |
|---|---|--|
| | Item Description | Annual Cost |
| a | Trace Metals | 1.1\$ |
| b | Volatile and Semivolatile Organic Compounds | 1.2\$ |
| c | General Ground Water Quality Parameters | 1.3\$ |
| d | Alternate Parameter List (site specific) | 1.4\$ |
| e | Assessment Monitoring Parameters | 1.5\$ |
| f | Background Sampling (For new wells only) | 1.6\$ |
| g | Collection and Transportation of Samples | \$ |
| h | | \$ |
| <i>Subtotal for Ground Water Monitoring</i> (multiplied by years of post-closure care), for Closure Care Detail Worksheet 9.1 divide by the number of post-closure years to get an adjusted annual cost | | Insert amount from this box onto line I on Summary Sheet \$ |

| II | Explosive Gas Migration Monitoring | | | |
|---|---|-----------------|-----------|---|
| | Item Description | Annual Quantity | Unit Cost | Annual Cost |
| a | Quarterly (Years 1-5) (per Sample Event) | 4 | \$ | \$ |
| b | Semi-Annual (Years 6-30) (per Sample Event) | 2 | \$ | \$ |
| c | Alternate Frequency (per Sample Event) | | \$ | \$ |
| d | | | \$ | \$ |
| Total Annual Cost | | | | \$ |
| <i>Subtotal for Gas Monitoring</i> (for all years of post-closure care) | | | | Insert amount from this box onto line II on Summary Sheet \$ |

| III | Leachate Monitoring | |
|--|--|--|
| | Item Description | Annual Cost |
| a | Annual Grab Sample 3745-27-19(M)(5) | 3.1\$ |
| b | Cost of Testing for Special Constituents | 3.2\$ |
| c | Collection and Transportation of Samples | \$ |
| d | | \$ |
| <i>Subtotal for Leachate Monitoring</i> (multiplied by years of post-closure care) | | Insert amount from this box onto line III on Summary Sheet \$ |

Post Closure Cost Estimate Cover Sheet

| IV | Surface Water Monitoring | |
|---|--|---|
| | Item Description | Annual Cost |
| a | Sampling per NPDES Permit, Closure Plan, or Other Authorizing Document | 4.1\$ |
| b | Collection and Transportation of Samples | \$ |
| c | | \$ |
| <i>Subtotal Surface Water Monitoring</i> (multiplied by years of post-closure care) | | Insert amount from this box onto line IV on Summary Sheet \$ |

| V | Operation and Maintenance of Leachate Collection and Treatment System | | | |
|---|---|-----------------|-----------|--|
| | Item Description | Annual Quantity | Unit Cost | Annual Cost |
| a | Inspection & Flushing of Collection Pipes (LF) | | \$ | \$ |
| b | Inspection & Cleaning of Sumps & Traps (EA) | | \$ | \$ |
| c | Replacement of Sump pumps, piping & instrumentation (EA) | | \$ | \$ |
| d | Inspection & cleaning of lift station(s), manhole(s) & conveyance structures (EA) | | \$ | \$ |
| e | Replacement of conveyance structure pumps, piping & instrumentation (EA) | | \$ | \$ |
| f | Tanks (Spill containment repair, sealing, tank cleaning & inspection) (EA) | | \$ | \$ |
| g | Transportation Cost of Sludge Removal (CY) transportation radius: _____ | | \$ | \$ |
| h | Disposal Cost for Sludge Removal (CY) disposal site: _____ | | \$ | \$ |
| i | Characterization Cost of Sludge Removal (CY) | | \$ | \$ |
| j | Off-site Disposal of Leachate : | | | 5.1\$ |
| k | On-site Treatment and/or Pretreatment of Leachate | | | 5.2\$ |
| l | | | | |
| <i>Subtotal Operation and Maintenance of Leachate Collection and Treatment Systems</i> (multiplied by years of post-closure care) | | | | Insert amount from this box onto line V on Summary Sheet \$ |

Post Closure Cost Estimate Cover Sheet

| VI | Operation and Maintenance of Ground Water Monitoring System | | |
|--|--|-----------|---|
| | Item Description | Unit Cost | Annual Average Cost |
| a | Routine Maintenance (inspection, cleaning, repairing) | \$ | \$ |
| b | Repair & Replacement of Monitoring Wells | | 6.1\$ |
| c | | | \$ |
| Total Annual Average Cost multiplied by years of post-closure care | | | \$ |
| d | Abandonment at end of post-closure care period (number of wells: _____) | \$ | \$ |
| <i>Subtotal for Operations and Maintenance of Ground Water Monitoring System</i> | | | Insert amount from this box onto line VI on Summary Sheet \$ |

| VII | Operation and Maintenance of Explosive Gas Extraction and/or Control System | | |
|---|---|-----------|--|
| | Item Description | Unit Cost | Annual Average Cost |
| a | Extraction Well Repair & Replacement | | 7.1\$ |
| b | Collection System Repair & Replacement | | 7.2\$ |
| c | Flare System Repair & Replacement | | 7.3\$ |
| d | Air Emissions Monitoring [NSPS and OAC 3745-76] (number of years to be monitored: _____) | | 7.4\$ |
| e | Special Control & Conveyance Structures | | 7.5\$ |
| f | | | \$ |
| Total Annual Average Cost multiplied by years of post-closure care | | | \$ |
| g | Well Abandonment at end of post-closure care period (number of wells: _____) | \$ | \$ |
| h | System Abandonment at end of post-closure care period | \$ | \$ |
| <i>Subtotal for Operation & Maintenance of Explosive Gas Extraction and/or Control System</i> | | | Insert amount from this box onto line VII on Summary Sheet \$ |

Post Closure Cost Estimate Cover Sheet

| VIII Operation and Maintenance of Explosive Gas Monitoring System | | | |
|--|---|-----------|---|
| | Item Description | Unit Cost | Annual Average Cost |
| a | Inspection & Routine Maintenance | \$ | \$ |
| b | Repair & Replacement of Monitoring Probes | | 8.1\$ |
| c | Repair & Replacement of Monitoring Alarms | | 8.2\$ |
| d | | | \$ |
| Total Annual Average Cost multiplied by years of post-closure care | | | \$ |
| e | Abandonment at end of post-closure care period (number of probes:) | \$ | \$ |
| <i>Subtotal for Operations and Maintenance of Gas Monitoring System</i> | | | Insert amount from this box onto line VIII on Summary Sheet \$ |

| IX Utilities for Operation | | | | | |
|--|------------------|----------|-----------------|-----------|---|
| | Item Description | Supplier | Annual Quantity | Unit Cost | Annual Cost |
| a | Electricity | | | \$ | \$ |
| b | Natural Gas | | | \$ | \$ |
| c | Propane | | | \$ | \$ |
| d | | | | \$ | \$ |
| <i>Subtotal for Utilities for Operation (multiplied by years of post-closure care)</i> | | | | | Insert amount from this box onto line IX on Summary Sheet \$ |

| X Maintenance of Cover System | | | | |
|--|--|-----------------|-----------|--|
| | Item Description | Annual Quantity | Unit Cost | Annual Cost |
| a | Mowing, fertilizing, removal of trees, mulching and seeding (EA) <small>Minimum mowing frequency of twice annually</small> | | \$ | \$ |
| b | Cap Repair (leachate outbreak repair, erosion rill repair, differential settlement repair) <small>Minimum of 2% of cost used in section III of Closure Cost Estimate Cover Sheet</small> | | \$ | \$ |
| c | Maintain Grade & Erosion Repair <small>Minimum based on annual erosion rate</small> | | \$ | \$ |
| d | Rodent Control (Acre) | | \$ | \$ |
| e | | | \$ | \$ |
| <i>Subtotal for Maintenance of Cover System (multiplied by years of post-closure care)</i> | | | | Insert amount from this box onto line X on Summary Sheet \$ |

Post Closure Cost Estimate Cover Sheet

| XI | Operation and Maintenance of Surface Water Management System | | | |
|---|---|-----------------|-----------|---|
| | Item Description | Annual Quantity | Unit Cost | Annual Cost |
| a | Inspection & Routine Maintenance (LS) | | \$ | \$ |
| b | Ditch Cleaning & Repair (LF) | | \$ | \$ |
| c | Conveyance Structure Cleaning & Repair (EA) | | \$ | \$ |
| d | Sedimentation Pond Cleaning and Repair (EA) | | \$ | \$ |
| e | Spillway/Outlet Cleaning & Repair (EA) | | \$ | \$ |
| f | | | \$ | \$ |
| <i>Subtotal for Operation and Maintenance of Surface Water Management System (multiplied by years of post-closure care)</i> | | | | Insert amount from this box onto line XI on Summary Sheet \$ |

| XII | Operation and Maintenance of Access Control Structures | | | |
|---|---|-----------------|-----------|--|
| | Item Description | Annual Quantity | Unit Cost | Annual Cost |
| a | Inspection & Routine Maintenance (LS) | | \$ | \$ |
| b | Fence Repair & Replacement (LF) | | \$ | \$ |
| c | Gate Repair & Replacement (EA) | | \$ | \$ |
| d | Sign Repair & Replacement (EA) | | \$ | \$ |
| e | Maintenance of Roadways | | \$ | \$ |
| f | | | \$ | \$ |
| <i>Subtotal for Operation and Maintenance of Access Control Structures (multiplied by years of post-closure care)</i> | | | | Insert amount from this box onto line XII on Summary Sheet \$ |

Section I: Groundwater Monitoring Wells

**Detail Worksheet 1.1
Ground Water Monitoring: Trace Metals**

General Information on Analytical Services

| | |
|--|--|
| Name, Address and Contact for Laboratory | |
| Number of Wells in Routine Monitoring | |
| Number of Samples Collected per Sample Event | |
| Frequency of Sample Events (Annual Basis) | |

Option 1: Package Pricing for Laboratory Services

| | | |
|---|--|-----|
| Package Price for Trace Metals** | | *\$ |
| Number of Samples | | |
| Frequency, Annual Basis | | |
| Total Samples Tested Annually (number of samples X frequency of samples) | | |
| Total Annual Cost for Post Closure Worksheet 1.1*** (Package price X total number samples) | | \$ |

* If package price is not available, please use the table below.

Option 2: Individual Parameter Pricing for Laboratory Services

| Analytical Parameter | # Samples | Frequency | USEPA Method | Unit Cost ** | Annual Cost + |
|--|-----------|-----------|--------------|--------------|---------------|
| Antimony | | | | \$ | \$ |
| Arsenic | | | | \$ | \$ |
| Barium | | | | \$ | \$ |
| Beryllium | | | | \$ | \$ |
| Cadmium | | | | \$ | \$ |
| Chromium | | | | \$ | \$ |
| Cobalt | | | | \$ | \$ |
| Copper | | | | \$ | \$ |
| Lead | | | | \$ | \$ |
| Mercury | | | | \$ | \$ |
| Nickel | | | | \$ | \$ |
| Selenium | | | | \$ | \$ |
| Silver | | | | \$ | \$ |
| Thallium | | | | \$ | \$ |
| Vanadium | | | | \$ | \$ |
| Zinc | | | | \$ | \$ |
| Total Annual Cost for Detail Worksheet 1.1*** | | | | | \$ |

***Insert Cost for Detail Worksheet 1.1 onto Post Closure Cost Estimate Cover Sheet, Section I, line a.

** Costs to include field QA/QC (equipment blanks, field blanks, etc.) and lab QA/QC (trip blanks, duplicates, matrix spikes etc.).

+ Refer to the appropriate rules for the required parameters. If a parameter is not required, put "NR" as the Annual Cost.

Section I: Groundwater Monitoring Wells

Detail Worksheet 1.2

Ground Water Monitoring: Volatile and Semivolatile Organic Compounds

General Information on Analytical Services

| | |
|--|--|
| Name, Address and Contact for Laboratory | |
| Number of Wells in Routine Monitoring | |
| Number of Samples Collected per Sample Event | |
| Frequency of Sample Events (Annual Basis) | |

Option 1: Package Pricing for Laboratory Services

| | | |
|---|--|----|
| Package Price for Volatile & Semivolatile Organic Compounds** | | \$ |
| Number of Samples | | |
| Frequency, Annual Basis | | |
| Total Samples Tested Annually (number of samples X frequency of samples) | | |
| Total Annual Cost for Post Closure Care Worksheet 1.2*** (Package price X total number samples) | | \$ |

* If package price is not available, please use the table below.

Option 2: Individual Parameter Pricing for Laboratory Services

| Analytical Parameter | # Samples | Frequency | USEPA Method | Unit Cost** | Annual Cost + |
|---|-----------|-----------|--------------|-------------|---------------|
| Acetone | | | | \$ | \$ |
| Acrylonitrile | | | | \$ | \$ |
| Benzene | | | | \$ | \$ |
| Bromochloromethane | | | | \$ | \$ |
| Bromodichloromethane | | | | \$ | \$ |
| Bromoform / Tribromomethane | | | | \$ | \$ |
| Carbon Disulfide | | | | \$ | \$ |
| Carbon Tetrachloride | | | | \$ | \$ |
| Chrolobenzene | | | | \$ | \$ |
| Chloroethane / Ethyl Chloride | | | | \$ | \$ |
| Chloroform / Trichloromethane | | | | \$ | \$ |
| Dibromochloromethane / Chlorodibromomethane | | | | \$ | \$ |
| 1,2-Dibromo-3-Chloropropane / DBCP | | | | \$ | \$ |
| 1,2-Dibromomethane/Ethylene Dibromide/ EDB | | | | \$ | \$ |
| o-Dichlorobenzene / 1,2-Dichlorobenzene | | | | \$ | \$ |
| p-Dichlorobenzene / 1,4-Dichlorobenzene | | | | \$ | \$ |

Option 2: Individual Parameter Pricing for Laboratory Services (continued)

| | | | | | |
|---|--|--|--|----|----|
| trans-1,4-Dichloro-2-Butene | | | | \$ | \$ |
| 1,1-Dichloroethane / Ethylidene Chloride | | | | \$ | \$ |
| 1,2-Dichloroethane / Ethylidene Dichloride | | | | \$ | \$ |
| 1,1-Dichloroethylene / 1,1-Dichloroethene / Vinylidene Chloride | | | | \$ | \$ |
| cis-1,2-Dichloroethylene / cis-1,2-Dichloroethene | | | | \$ | \$ |
| trans-1,2-Dichloroethylene/trans-1,2-Dichloroethene | | | | \$ | \$ |
| 1,2-Dichloropropane, Propylene Dichloride | | | | \$ | \$ |
| cis-1,3-Dichloropropene | | | | \$ | \$ |
| trans-1,3-Dichloropropene | | | | \$ | \$ |
| Ethylbenzene | | | | \$ | \$ |
| 2-Hexanone / Methyl Butyl Ketone | | | | \$ | \$ |
| Methyl Bromide / Bromomethane | | | | \$ | \$ |
| Methyl Chloride / Chloromethane | | | | \$ | \$ |
| Methylene Bromide / Dibromomethane | | | | \$ | \$ |
| Methylene Chloride / Dichloromethane | | | | \$ | \$ |
| Methyl Ethyl Keytone / MEK / 2-Butanone | | | | \$ | \$ |
| Methyl Iodide / Iodomethane | | | | \$ | \$ |
| 4-Methyl-2-pentanone / Methyl Isobutyl Ketone | | | | \$ | \$ |
| Styrene | | | | \$ | \$ |
| 1,1,1,2-Tetrachloroethane | | | | \$ | \$ |
| 1,1,2,2-Tetrachloroethane | | | | \$ | \$ |
| Tetrachloroethylene / Tetrachloroehene / Perchloroethylene | | | | \$ | \$ |
| Toluene | | | | \$ | \$ |
| 1,1,1-Trichloroethane / Methylchloroform | | | | \$ | \$ |
| 1,1,2-Trichloroethane | | | | \$ | \$ |
| Trichloroethylene / Trichloroethene | | | | \$ | \$ |
| Trichloroflourmethane / CFC-11 | | | | \$ | \$ |
| 1,2,3-Trichloropropane | | | | \$ | \$ |
| Vinyl Acetate | | | | \$ | \$ |
| Vinyl Chloride | | | | \$ | \$ |
| Xylenes | | | | \$ | \$ |
| Total Annual Cost for Detail Worksheet 1.2*** | | | | | \$ |

***** Insert Cost for Detail Worksheet 1.2 onto Post Closure Cost Estimate Cover Sheet, Section I, line b.**

** Costs to include field QA/QC (equipment blanks, field blanks, etc.) and lab QA/QC (trip blanks, duplicates, matrix spikes etc.)

+ Refer to the appropriate rules for the required parameters. If a parameter is not required, put "NR" as the Annual Cost.

Section I: Groundwater Monitoring Wells

**Detail Worksheet 1.3
Ground Water Monitoring: General Ground Water Quality Parameters**

General Information on Analytical Services

| | |
|--|--|
| Name, Address and Contact for Laboratory | |
| Number of Wells in Routine Monitoring | |
| Number of Samples Collected per Sample Event | |
| Frequency of Sample Events (Annual Basis) | |

Option 1: Package Pricing for Laboratory Services

| | | |
|--|--|-----|
| Package Price for General Ground Water Quality Parameters** | | *\$ |
| Number of Samples | | |
| Frequency, Annual Basis | | |
| Total Samples Tested Annually (number of samples X frequency of samples) | | |
| Total Annual Cost for Post Closure Care Worksheet 1.3*** (Package price X total number samples) | | \$ |

* If package price is not available, please use the table below.

Option 2: Individual Parameter Pricing for Laboratory Services

| Analytical Parameter | # Samples | Frequency | USEPA Method | Unit Cost** | Annual Cost + |
|-------------------------|-----------|-----------|--------------|-------------|---------------|
| Ammonia | | | | \$ | \$ |
| Chloride | | | | \$ | \$ |
| Sodium | | | | \$ | \$ |
| Chemical Oxygen Demand | | | | \$ | \$ |
| Temperature ++ | | | | \$ | \$ |
| pH++ | | | | \$ | \$ |
| Specific Conductance ++ | | | | \$ | \$ |
| Total Dissolved Solids | | | | \$ | \$ |
| Total Alkalinity | | | | \$ | \$ |
| Nitrate-Nitrite | | | | \$ | \$ |
| Sulfate | | | | \$ | \$ |
| Magnesium | | | | \$ | \$ |
| Calcium | | | | \$ | \$ |
| Potassium | | | | \$ | \$ |
| Turbidity | | | | \$ | \$ |

Section I: Groundwater Monitoring Wells

**Detail Worksheet 1.3
Ground Water Monitoring: General Ground Water Quality Parameters**

Option 2: Individual parameter Pricing for Laboratory Services (continued)

| | | | | | |
|----------------------|--|--|--|----|----|
| Iron | | | | \$ | \$ |
| Manganese | | | | \$ | \$ |
| Total Organic Carbon | | | | \$ | \$ |
| Phenolics | | | | \$ | \$ |
| Formaldehyde | | | | \$ | \$ |
| Fluoride | | | | \$ | \$ |
| Gross Alpha | | | | \$ | \$ |
| Gross Beta | | | | \$ | \$ |

| | |
|--|----|
| Total Annual Cost for Detail Worksheet 1.3*** | \$ |
|--|----|

***** Insert Cost for Detail Worksheet 1.3 onto Post Closure Cost Estimate Cover Sheet, Section I, line c.**

** Costs to include field QA/QC (equipment blanks, field blanks, etc.) and lab QA/QC (trip blanks, duplicates, matrix spikes etc.)

+ Refer to the appropriate rules for the required parameters. If a parameter is not required, put "NR" as the Annual Cost.

++ Field Parameter

Post Closure Detail Worksheet

Section I: Groundwater Monitoring Wells

**Detail Worksheet 1.4
Ground Water Monitoring: Alternate Parameters (site specific)**

General Information on Analytical Services

| | |
|--|--|
| Name, Address and Contact for Laboratory | |
| Number of Wells in Alternate Monitoring | |
| Number of Samples Collected per Sample Event | |
| Frequency of Sample Events (Annual Basis) | |

Option 1: Package Pricing for Laboratory Services

| | | |
|---|--|-----|
| Package Price for Alternate Parameters** | | *\$ |
| Number of Samples | | |
| Frequency, Annual Basis | | |
| Total Samples Tested Annually (number of samples X frequency of samples) | | |
| Total Annual Cost for Post Closure Care Worksheet 1.4*** (Package price X total number samples) | | \$ |

* If package price is not available, please use the table below. Even if providing a package price, please list the specific parameters and appropriate U.S. EPA method reference.

Option 2: Individual Parameter Pricing for Laboratory Services Use additional sheets as necessary.

| | Analytical Parameter | # Samples | Frequency | USEPA Method | Unit Cost** | Annual Cost + |
|--|----------------------|-----------|-----------|--------------|-------------|---------------|
| Alternate Parameters** | | | | | | |
| | | | | | \$ | \$ |
| | | | | | \$ | \$ |
| | | | | | \$ | \$ |
| | | | | | \$ | \$ |
| | | | | | \$ | \$ |
| | | | | | \$ | \$ |
| | | | | | \$ | \$ |
| | | | | | \$ | \$ |
| | | | | | \$ | \$ |
| | | | | | \$ | \$ |
| Total Annual Cost for Detail Worksheet 1.4*** | | | | | | \$ |

*****Insert Cost for Detail Worksheet 1.4 onto Post Closure Cost Estimate Cover Sheet, Section I, line d.**
 ** Costs to include field QA/QC (equipment blanks, field blanks, etc.) and lab QA/QC (trip blanks, duplicates, matrix spikes etc.)

Section I: Groundwater Monitoring Wells

**Detail Worksheet 1.5
Ground Water Monitoring: Assessment Monitoring Parameters**

General Information on Analytical Services

| | |
|--|--|
| Name, Address and Contact for Laboratory | |
| Number of Wells in Assessment | |
| Number of Samples Collected per Sample Event | |
| Frequency of Sample Events (Annual Basis) | |

Option 1: Package Pricing for Laboratory Services

| | | |
|--|--|-----|
| Package Price for Assessment Parameters | | *\$ |
| Number of Samples | | |
| Frequency, Annual Basis | | |
| Total Samples Tested Annually (number of samples X frequency of samples) | | |
| Total Annual Cost for Post Closure Care Worksheet 1.5*** (Package price X total number samples) | | \$ |

* If package price is not available, please use the table below.

Option 2: Individual Parameter Pricing for Laboratory Services

| | Analytical Parameter | # Samples | Frequency | USEPA Method | Unit Cost | Annual Cost |
|--------------------------------|--|-----------|-----------|--------------|-----------|-------------|
| Assessment Parameters** | | | | | | |
| 1 | Acenaphthene; 1,2-Dihydroacenaphthylene | | | | \$ | \$ |
| 2 | Acenaphthylene | | | | \$ | \$ |
| 3 | Acetone; 2-Propanone | | | | \$ | \$ |
| 4 | Acetonitrile; Methyl cyanide | | | | \$ | \$ |
| 5 | Acetophenone; 1-Phenylethanone | | | | \$ | \$ |
| 6 | 2-Acetylaminofluorene; 2-AAF; N-9H-flouren-2-yl-acetamide | | | | \$ | \$ |
| 7 | Acrolein; 2-Propenal | | | | \$ | \$ |
| 8 | Acrylonitrile; 2-Propenenitrile | | | | \$ | \$ |
| 9 | Aldrin;1,2,3,4,10,10-hexachloro-1,4,4a,5,8,8a-hexahydro-1,4:5,8-Dimethanonaphalene | | | | \$ | \$ |
| 10 | Allyl chloride; 3-Chloro-1-propene | | | | \$ | \$ |
| 11 | 4-Aminobiphenyl; [1,1'-Biphenyl]-4-amine | | | | \$ | \$ |
| 12 | Anthracene | | | | \$ | \$ |
| 13 | Antimony | | | | \$ | \$ |
| 14 | Arsenic | | | | \$ | \$ |
| 15 | Barium | | | | \$ | \$ |
| 16 | Benzene | | | | \$ | \$ |
| 17 | Benzo[a]anthracene; Benzathracene | | | | \$ | \$ |

Section I: Groundwater Monitoring Wells

**Detail Worksheet 1.5
Ground Water Monitoring: Assessment Parameters**

Option 2: Individual Parameter Pricing for Laboratory Services *(continued)*

| | Analytical Parameter | # Samples | Frequency | USEPA Method | Unit Cost | Annual Cost |
|--------------------------------|----------------------|-----------|-----------|--------------|-----------|-------------|
| Assessment Parameters** | | | | | | |

| | | | | | | |
|----|--|--|--|--|----|----|
| 18 | Benzo[b]flouranthene; Benz[e]acephenanthylene | | | | \$ | \$ |
| 19 | Benzo[k]flouranthene | | | | \$ | \$ |
| 20 | Benzo[ghi]perylene | | | | \$ | \$ |
| 21 | Benzo[a]pyrene | | | | \$ | \$ |
| 22 | Benzyl Alcohol; Benzenemethanol | | | | \$ | \$ |
| 23 | Beryllium | | | | \$ | \$ |
| 24 | alpha-BHC; 1,2,3,4,5,6-Hexachlorocyclohexane | | | | \$ | \$ |
| 25 | beta-BHC; 1,2,3,4,5,6-Hexachlorocyclohexane | | | | \$ | \$ |
| 26 | delta-BHC; 1,2,3,4,5,6-Hexachlorocyclohexane | | | | \$ | \$ |
| 27 | gamma-BHC; Lindane; 1,2,3,4,5,6-Hexachlorocyclohexane | | | | \$ | \$ |
| 28 | bis(2-Chloroethoxy)methane; 1,1'-[methylenebis(oxy)]bis[2-chloroethane] | | | | \$ | \$ |
| 29 | bis(2-Chloroethyl) ether; Dichloroethyl ether; 1,1'-oxybis[2-Chloroethane] | | | | \$ | \$ |
| 30 | bis-(2-Chloro-1-methylethyl) Ether; 2,2'-Dichlorodiisopropyl ether; DCIP; 2,2'-oxybis[1-Chloropropane] | | | | \$ | \$ |
| 31 | bis(2-Ethylhexyl) Phthalate; 1,2-Benzenedicarboxylic acid, bis(2-Ethylhexyl) ester | | | | \$ | \$ |
| 32 | Bromochloromethane; Chlorobromomethane | | | | \$ | \$ |
| 33 | Bromodichloromethane; Dibromochloromethane | | | | \$ | \$ |
| 34 | Bromoform; Tribromomethane | | | | \$ | \$ |
| 35 | 4-Bromophenyl phenyl ether; 1-Bromo-4-phenoxybenzene | | | | \$ | \$ |
| 36 | Butyl benzyl phthalate; Benzyl butyl phthalate; 1,2-Benzenedicarboxylic acid, Butyl phenylmethyl ester | | | | \$ | \$ |
| 37 | Cadmium | | | | \$ | \$ |
| 38 | Carbon disulfide | | | | \$ | \$ |
| 39 | Carbon tetrachloride; Tetrachloromethane | | | | \$ | \$ |
| 40 | Chlordane; 1,2,4,5,6,8,8-octochloro-2,3,3a,4,7,7a-hexahydro-4,7-methano-1H-indene | | | | \$ | \$ |
| 41 | p-Chloroaniline; 4-Chlorobenzenamine | | | | \$ | \$ |
| 42 | Chlorobenzene | | | | \$ | \$ |
| 43 | Chlorobenzilate; 4-Chloro-a-(4-Chlorophenyl)-a-Hydroxybenzeneacetic acid, Ethyl ester | | | | \$ | \$ |

Section I: Groundwater Monitoring Wells

**Detail Worksheet 1.5
Ground Water Monitoring: Assessment Parameters**

Option 2: Individual Parameter Pricing for Laboratory Services *(continued)*

| | Analytical Parameter | # Samples | Frequency | USEPA Method | Unit Cost | Annual Cost |
|--------------------------------|----------------------|-----------|-----------|--------------|-----------|-------------|
| Assessment Parameters** | | | | | | |

| | | | | | | |
|----|---|--|--|--|----|----|
| 44 | p-Chloro-m-Cresol; 4-Chloro-3-Methylphenol | | | | \$ | \$ |
| 45 | Chloroethane; Ethyl chloride | | | | \$ | \$ |
| 46 | Chloroform; Trichloromethane | | | | \$ | \$ |
| 47 | 2-Chloronaphthalene | | | | \$ | \$ |
| 48 | 2-Chlorophenol | | | | \$ | \$ |
| 49 | 4-Chlorophenyl phenyl ether; 1-Chloro-4-phenoxy benzene | | | | \$ | \$ |
| 50 | Chloroprene; 2-Chloro-1,3-butadiene | | | | \$ | \$ |
| 51 | Chromium | | | | \$ | \$ |
| 52 | Chrysene | | | | \$ | \$ |
| 53 | Cobalt | | | | \$ | \$ |
| 54 | Copper | | | | \$ | \$ |
| 55 | m-Cresol; 3-Methylphenol | | | | \$ | \$ |
| 56 | o-Cresol; 2-Methylphenol | | | | \$ | \$ |
| 57 | p-Cresol; 4-Methylphenol | | | | \$ | \$ |
| 58 | Cyanide | | | | \$ | \$ |
| 59 | 2,4-D; 2,4-Dichlorophenoxyacetic acid | | | | \$ | \$ |
| 60 | 4,4'-DDD; 1,1'-(2,2-Dichloroethylidene)bis [4-chlor126benzene] | | | | \$ | \$ |
| 61 | 4,4'-DDE; 1,1'-(2,2-Dichloroethenylydene)bis [4-chlor129benzene] | | | | \$ | \$ |
| 62 | 4,4'-DDT; 1,1'-(2,2,2-Trichloroethylidene)bis [4-chlorobenzene] | | | | \$ | \$ |
| 63 | Diallate; bis(1-Methylethyl)-carbamoithoic acid S-(2,3-Dichloro-2-propenyl) ester | | | | \$ | \$ |
| 64 | Dibenz[a,h]anthracene | | | | \$ | \$ |
| 65 | Dibenzofuran | | | | \$ | \$ |
| 66 | Dibromocholormethane; Chlorodibromomethane | | | | \$ | \$ |
| 67 | 1,2-Dibromo-3-chloropropane; DBCP | | | | \$ | \$ |
| 68 | 1,2-Dibromoethane; Ethylene dribromide; EDB | | | | \$ | \$ |
| 69 | Di-n-butyl phthalate; 1,2-Benzenedicarboxylic acid dibutyl ester | | | | \$ | \$ |
| 70 | o-Dichlorobenzene; 1,2-Dichlorobenzene | | | | \$ | \$ |
| 71 | m-Dichlorobenzene; 1,3-Dichlorobenzene | | | | \$ | \$ |
| 72 | p-Dichlorobenzene; 1,4-Dichlorobenzene | | | | \$ | \$ |

Section I: Groundwater Monitoring Wells

**Detail Worksheet 1.5
Ground Water Monitoring: Assessment Parameters**

Option 2: Individual Parameter Pricing for Laboratory Services *(continued)*

| | Analytical Parameter | # Samples | Frequency | USEPA Method | Unit Cost | Annual Cost |
|--------------------------------|----------------------|-----------|-----------|--------------|-----------|-------------|
| Assessment Parameters** | | | | | | |

| | | | | | | |
|----|--|--|--|--|----|----|
| 73 | 3,3'-Dichlorobenzidine; 3,3'-Dichloro-[1,1'-bi phenyl]-4,4'-diamine | | | | \$ | \$ |
| 74 | trans-1,4-Dichloro-2-butene | | | | \$ | \$ |
| 75 | Dichlorodifluoromethane; CFC 12 | | | | \$ | \$ |
| 76 | 1,1-Dichloroethane; Ethylidene chloride | | | | \$ | \$ |
| 77 | 1,2-Dichloroethane; Ethylene dichloride | | | | \$ | \$ |
| 78 | 1,1-Dichloroethylene; 1,1-Dichloroethene; Vinylidene chloride | | | | \$ | \$ |
| 79 | cis-1,2-Dichloroethylene; cis-1,2-Dichloroethene | | | | \$ | \$ |
| 80 | trans-1,2-Dichloroethylene; trans-1,2-Dichloro ethene | | | | \$ | \$ |
| 81 | 2,4-Dichlorophenol | | | | \$ | \$ |
| 82 | 2,6-Dichlorophenol | | | | \$ | \$ |
| 83 | 1,2-Dichloropropane; Propylene dichloride | | | | \$ | \$ |
| 84 | 1,3-Dichloropropane; Trimethylene dichloride | | | | \$ | \$ |
| 85 | 2,2-Dichloropropane; Isopropylidene chloride | | | | \$ | \$ |
| 86 | 1,1-Dichloropropene; 1,1-Dichloro-1-propene | | | | \$ | \$ |
| 87 | cis-1,3-Dichloropropene | | | | \$ | \$ |
| 88 | trans-1,3-Dichloropropene | | | | \$ | \$ |
| 89 | Dieldrin; 3,4,5,6,9,9-Hexachloro-1a,2,2a,3,6,6a, 7,7a-octahydro-2,7:3,6-dimethanonaphthalene [2,3-b]oxirene, (1aa,2b,2aa,3b,6b,6aa,7b,7aa) | | | | \$ | \$ |
| 90 | Diethyl phthalate; 1,2-Benzenedicarboxylic acid, Diethyl ester | | | | \$ | \$ |
| 91 | O,O-Diethyl O-2-Pyrazinyl phosphorothioate; Thionazin | | | | \$ | \$ |
| 92 | Dimethoate; Phosphorodithoic acid O,O-Dimethyl-S-[2-(methylamino)-2-oxoethyl] ester | | | | \$ | \$ |
| 93 | p-(Dimethylamino)azobenzene; N,N-Dimethyl-4-(phenylazo)benzenamine | | | | \$ | \$ |
| 94 | 7,12-Dimethylbenz[a]anthracene | | | | \$ | \$ |
| 95 | 3,3'-Dimethylbenzidine; 3,3'-Dimethyl[1,1'bi phenyl]-4,4'-diamine | | | | \$ | \$ |
| 96 | 2,4-Dimethylphenol; m-Xylenol | | | | \$ | \$ |
| 97 | Dimethyl phthalate; 1,2-Benzenedicarboxylic acid, dimethyl ester | | | | \$ | \$ |
| 98 | m-Dinitrobenzene | | | | \$ | \$ |

Section I: Groundwater Monitoring Wells

**Detail Worksheet 1.5
Ground Water Monitoring: Assessment Parameters**

Option 2: Individual Parameter Pricing for Laboratory Services *(continued)*

| | Analytical Parameter | # Samples | Frequency | USEPA Method | Unit Cost | Annual Cost |
|--------------------------------|--|-----------|-----------|--------------|-----------|-------------|
| Assessment Parameters** | | | | | | |
| 99 | 4,6-Dinitro-o-cresol; 4,6-Dinitro-2-methylphenol; 2-Methyl-4,6-dinitrophenol | | | | \$ | \$ |
| 100 | 2,4-Dinitrophenol | | | | \$ | \$ |
| 101 | 2,4-Dinitrotoluene; 1-Methyl-2,4-dinitrobenzene | | | | \$ | \$ |
| 102 | 2,6-Dinitrotoluene; 2-Methyl-1,3-dinitrobenzene | | | | \$ | \$ |
| 103 | Dinoseb; DMBP; 2-sec-Butyl-4,6-dinitrophenol; 2-(1-Methylpropyl)-4,5-dinitrophenol | | | | \$ | \$ |
| 104 | Di-n-octyl phthalate; 1,2-Benzenedicarboxylic acid, Dioctyl ester | | | | \$ | \$ |
| 105 | Diphenylamine; N-phenylbenzenamine | | | | \$ | \$ |
| 106 | Disulfoton; Phosphorodithioic acid O,O-diethyl S-[2-(ethylthio)ethyl] ester | | | | \$ | \$ |
| 107 | Endosulfan I; 6,7,8,9,10,10-Hexachloro-1,5,5a,6,9,9a-hexahydro-6,9-methano-2,4,3-benzodioxathiepin, 3-oxide | | | | \$ | \$ |
| 108 | Endosulfan II; 6,7,8,9,10,10-Hexachloro-1,5,5a,6,9,9a-hexahydro-6,9-methano-2,4,3-benzodioxathiepin, 3-oxide (3a,5aa,6b,9b,9aa) | | | | \$ | \$ |
| 109 | Endosulfan sulfate; 6,7,8,9,10,10-hexachloro-1,5,5a,6,9,9a-hexahydro-6,9-methano-2,4,3-benzodioxathiepin, 3-3-dioxide | | | | \$ | \$ |
| 110 | Endrin; 3,4,5,6,9,9-hexachloro-1a,2,2a,3,6,6a,7,7a-octahydro-2,7:3,6-dimethanonaphth[2,3-b]oxirene, (1aa,2b,2ab,3a,6a,6ab,7b,7aa) | | | | \$ | \$ |
| 111 | Endrin aldehyde; 2,2a,3,3,4,7-hexachlorodecahydro-1,2,4-methenocyclopenta[cd]pentalene-5-carboxaldehyde, (1a,2b,2ab,4b,4ab,5b,6ab,6bb,7r*) | | | | \$ | \$ |
| 112 | Ethylbenzene | | | | \$ | \$ |
| 113 | Ethyl methacrylate; 2-Methyl-2-propenoic acid, ethyl ester | | | | \$ | \$ |
| 114 | Ethyl methanesulfonate; Methanesulfonic acid, ethyl ester | | | | \$ | \$ |
| 115 | Famphur; Phosphorothioic acid, O-[4-[(dimethylamino) sulfonyl]phenyl]0,0-dimethyl ester | | | | \$ | \$ |
| 116 | Flouranthene | | | | \$ | \$ |
| 117 | Flourene; 9H-flourene | | | | \$ | \$ |
| 118 | Heptachlor; 1,4,5,6,7,8,8-heptachloro-3a,4,7,7a-tetrahydro-4,7-methano-1H-indene | | | | \$ | \$ |

Section I: Groundwater Monitoring Wells

**Detail Worksheet 1.5
Ground Water Monitoring: Assessment Parameters**

Option 2: Individual Parameter Pricing for Laboratory Services *(continued)*

| | Analytical Parameter | # Samples | Frequency | USEPA Method | Unit Cost | Annual Cost |
|--------------------------------|--|-----------|-----------|--------------|-----------|-------------|
| Assessment Parameters** | | | | | | |
| 119 | Heptachlor epoxide; 2,3,4,5,6,7,7-Heptachloro-1a,1b,5,5a,6,6a-hexahydro-2,5-methano-2h-indeno [1,2-b]oxirene, (1aa,1bb,2a,5a,5ab,6b,6aa) | | | | \$ | \$ |
| 120 | Hexachlorobenzene | | | | \$ | \$ |
| 121 | Hexachlorobutadiene; 1,1,2,3,4,4-Hexachloro-1,3-butadiene | | | | \$ | \$ |
| 122 | Hexachlorocyclopentadiene; 1,2,3,4,5,5-Hexachloro-1,3-cyclopentadiene | | | | \$ | \$ |
| 123 | Hexachloroethane | | | | \$ | \$ |
| 124 | Hexachloropropene; 1,1,2,3,3,3-Hexachloro-1-propene | | | | \$ | \$ |
| 125 | 2-Hexanone; Methyl butyl ketone | | | | \$ | \$ |
| 126 | Indeno(1,2,3-cd)pyrene | | | | \$ | \$ |
| 127 | Isobutyl alcohol;2-Methyl-1-propanol | | | | \$ | \$ |
| 128 | Isodrin; 1,2,3,4,10,10-Hexachloro-1,4,4a,5,8,8a-hexahydro-1,4,5,8-dimethanonaphthalene, (1a,4a,4ab,5b,8b,8ab) | | | | \$ | \$ |
| 129 | Isophorone; 3,5,5-Trimethyl-2-cyclohexen-1-one | | | | \$ | \$ |
| 130 | Isosafrole; 5-(1-Propenyl)-1,3-benzodioxole | | | | \$ | \$ |
| 131 | Kepone; 1,1a,3,3a,4,5,5a,5b,6-decachlorocta hydro-1,3,4-methano-2H-cyclobuta[cd9]pentalen-2-one | | | | \$ | \$ |
| 132 | Lead | | | | \$ | \$ |
| 133 | Mercury | | | | \$ | \$ |
| 134 | Methacrylonitrile; 2-Methyl-2-propenenitrile | | | | \$ | \$ |
| 135 | Methapyrilene; N,N-dimethyl-N'-2-pyridinyl-N'-(1/2-thienylmethyl)-1,2-ethanediamine | | | | \$ | \$ |
| 136 | Methoxychlor; 1,1'-(2,2,2-Trichloroethylidene)bis [4-Methoxybenzene] | | | | \$ | \$ |
| 137 | Methyl bromide; Bromomethane | | | | \$ | \$ |
| 138 | Methyl chloride; Chloromethane | | | | \$ | \$ |
| 139 | 3-Methylcholanthrene; 1,2-Dihydro-3-methyl-benze[j]aceanthrylene | | | | \$ | \$ |
| 140 | Methyl ethyl ketone; MEK; 2-Butanone | | | | \$ | \$ |
| 141 | Methyl iodide; Iodomethane | | | | \$ | \$ |
| 142 | Methyl methacrylate; 2-Methyl-2-propenoic acid, methyl ester | | | | \$ | \$ |

Section I: Groundwater Monitoring Wells

Detail Worksheet 1.5

Ground Water Monitoring: Assessment Parameters

Option 2: Individual Parameter Pricing for Laboratory Services *(continued)*

| | Analytical Parameter | # Samples | Frequency | USEPA Method | Unit Cost | Annual Cost |
|--------------------------------|---|-----------|-----------|--------------|-----------|-------------|
| Assessment Parameters** | | | | | | |
| 143 | Methyl methacrylate; 2-Methyl-2-propenoic acid, methyl ester | | | | \$ | \$ |
| 144 | 2-Methylnaphthalene | | | | \$ | \$ |
| 145 | Methyl parathion; Parathion methyl; Phosphorothioic acid, 0,0-dimethyl 0-(4-nitrophenyl) ester | | | | \$ | \$ |
| 146 | 4-Methyl-2-pentanone; Methyl isobutyl ketone | | | | \$ | \$ |
| 147 | Methylene bromide; Dibromomethane | | | | \$ | \$ |
| 148 | Methylene chloride; Dichloromethane | | | | \$ | \$ |
| 149 | Naphthalene | | | | \$ | \$ |
| 150 | 1,4-Naphthoquinone; 1,4-Naphthalenedione | | | | \$ | \$ |
| 151 | 1-Naphthylamine; 1-Naphthalenamine | | | | \$ | \$ |
| 152 | 2-Naphthylamine; 2-Naphthalenamine | | | | \$ | \$ |
| 153 | Nickel | | | | \$ | \$ |
| 154 | o-Nitroaniline; 2-Nitroaniline; 2-Nitrobenzenamine | | | | \$ | \$ |
| 155 | m-Nitroaniline; 3-Nitroaniline; 3-Nitrobenzenamine | | | | \$ | \$ |
| 156 | p-Nitroaniline; 4-Nitroaniline; 4-Nitrobenzenamine | | | | \$ | \$ |
| 157 | Nitrobenzene | | | | \$ | \$ |
| 158 | o-Nitrophenol; 2-Nitrophenol | | | | \$ | \$ |
| 159 | p-Nitrophenol; 4-Nitrophenol | | | | \$ | \$ |
| 160 | N-Nitrosodi-n-butylamine; N-Butyl-N-Nitroso-1-butanamine | | | | \$ | \$ |
| 161 | N-Nitrosodiethylamine; N-Ethyl-N-nitroso ethanamine | | | | \$ | \$ |
| 162 | N-Nitrosodimethylamine; N-Methyl-N-nitroso methanamine | | | | \$ | \$ |
| 163 | N-Nitrosodiphenylamine; N-Nitroso-N-phenyl benzenamine | | | | \$ | \$ |
| 164 | N-Nitrosodipropylamine; N-Nitroso-N-dipropylamine; di-n-propylnitrosamine; N-Nitroso-N-propyl-1-propanamine | | | | \$ | \$ |
| 165 | N-Nitrosomethylethylamine; N-Methyl-N-nitroso ethanamine | | | | \$ | \$ |
| 166 | N-Nitrosopiperidine; 1-Nitrosopiperidine | | | | \$ | \$ |
| 167 | N-Nitrosopyrrolidine; 1-Nitrosopyrrolidine | | | | \$ | \$ |
| 168 | 5-Nitro-o-toluidine; 2-Methyl-5-nitrobenzenamine | | | | \$ | \$ |

Section I: Groundwater Monitoring Wells

**Detail Worksheet 1.5
Ground Water Monitoring: Assessment Parameters**

Option 2: Individual Parameter Pricing for Laboratory Services *(continued)*

| | Analytical Parameter | # Samples | Frequency | USEPA Method | Unit Cost | Annual Cost |
|--------------------------------|----------------------|-----------|-----------|--------------|-----------|-------------|
| Assessment Parameters** | | | | | | |

| | | | | | | |
|-----|--|--|--|--|----|----|
| 169 | Parathion; Phosphorothioic acid, O,O-diethyl O-(4-nitrophenyl) ester | | | | \$ | \$ |
| 170 | Pentachlorobenzene | | | | \$ | \$ |
| 171 | Pentachloronitrobenzene | | | | \$ | \$ |
| 172 | Pentachlorophenol | | | | \$ | \$ |
| 173 | Phenacetin; N-(4-Ethoxyphenyl)acetamide | | | | \$ | \$ |
| 174 | Phenanthrene | | | | \$ | \$ |
| 175 | Phenol | | | | \$ | \$ |
| 176 | p-Phenylenediamine; 1,4-Benzenediamine | | | | \$ | \$ |
| 177 | Phorate; Phosphorodithioic acid, O,O-Diethyl S-[(ethylthio)methyl] ester | | | | \$ | \$ |
| 178 | Polychlorinated biphenyls; PCBs; aroclors; 1,1'-Biphenyl, chloro derivates | | | | \$ | \$ |
| 179 | Pronamide; 3,5-Dichloro-N-(1,1-dimethyl-2-propynyl)benzamide | | | | \$ | \$ |
| 180 | Propionitrile; Ethyl cyanide | | | | \$ | \$ |
| 181 | Pyrene | | | | \$ | \$ |
| 182 | Safrole; 5-(2-Propenyl)-1,3-benzodioxole | | | | \$ | \$ |
| 183 | Selenium | | | | \$ | \$ |
| 184 | Silver | | | | \$ | \$ |
| 185 | Silvex; 2,4,5-TP; 2-(2,4,5-Trichlorophenoxy)propanoic acid | | | | \$ | \$ |
| 186 | Styrene; Ethenylbenzene | | | | \$ | \$ |
| 187 | Sulfide | | | | \$ | \$ |
| 188 | 2,4,5-T; 2,4,5-Trichlorophenoxyacetic acid | | | | \$ | \$ |
| 189 | 1,2,4,5-Tetrachlorobenzene | | | | \$ | \$ |
| 190 | 1,1,1,2-Tetrachloroethane | | | | \$ | \$ |
| 191 | 1,1,2,2-Tetrachloroethane | | | | \$ | \$ |
| 192 | Tetrachloroethylene; Tetrachloroethene; Perchloroethylene | | | | \$ | \$ |
| 193 | 2,3,4,6-Tetrachlorophenol | | | | \$ | \$ |
| 194 | Thallium | | | | \$ | \$ |
| 195 | Tin | | | | \$ | \$ |
| 196 | Toluene; Methylbenzene | | | | \$ | \$ |
| 197 | o-Toluidine; 2-Methylbenzenamine | | | | \$ | \$ |

Section I: Groundwater Monitoring Wells

**Detail Worksheet 1.5
Ground Water Monitoring: Assessment Parameters**

Option 2: Individual Parameter Pricing for Laboratory Services *(continued)*

| | Analytical Parameter | # Samples | Frequency | USEPA Method | Unit Cost | Annual Cost |
|--------------------------------|----------------------|-----------|-----------|--------------|-----------|-------------|
| Assessment Parameters** | | | | | | |

| | | | | | | |
|-----|---|--|--|--|----|----|
| 198 | Toxaphene | | | | \$ | \$ |
| 199 | 1,2,4-Trichlorobenzene | | | | \$ | \$ |
| 200 | 1,1,1-Trichloroethane; Methylchloroform | | | | \$ | \$ |
| 201 | 1,1,2-Trichloroethane | | | | \$ | \$ |
| 202 | Trichloroethylene; Trichloroethene | | | | \$ | \$ |
| 203 | Trichlorofluoromethane; CFC-11 | | | | \$ | \$ |
| 204 | 2,4,5-Trichlorophenol | | | | \$ | \$ |
| 205 | 2,4,6-Trichlorophenol | | | | \$ | \$ |
| 206 | 1,2,3-Trichloropropane | | | | \$ | \$ |
| 207 | o,o,o-Triethyl phosphorothioate; Phosphorothioic acid, o,o,o-triethyl ester | | | | \$ | \$ |
| 208 | sym-Trinitrobenzene; 1,3,5-Trinitrobenzene | | | | \$ | \$ |
| 209 | Vanadium | | | | \$ | \$ |
| 210 | Vinyl acetate; Acetic acid, ethenyl ester | | | | \$ | \$ |
| 211 | Vinyl chloride; Chloroethene | | | | \$ | \$ |
| 212 | Xylene (total); Dimethylbenzene | | | | \$ | \$ |
| 213 | Zinc | | | | \$ | \$ |

| | |
|--|----|
| Total Annual Cost for Detail Worksheet 1.5*** | \$ |
|--|----|

*****Insert Cost for Detail Worksheet 1.5 onto Post Closure Cost Estimate Cover Sheet, Section I, line f.**

** Costs to include field QA/QC (equipment blanks, field blanks, etc.) and lab QA/QC (trip blanks, duplicates, matrix spikes etc.)

Section I: Groundwater Monitoring Wells

**Detail Worksheet 1.6
Ground Water Monitoring: Background Monitoring**

Option 2: Individual Parameter Pricing for Laboratory Services *(continued)*

General Information on Analytical Services

| | |
|---|--|
| Name, Address and Contact for Laboratory | |
| Number of Wells Requiring Background Sampling | uppermost aquifer: _____ significant zones: _____ |

Individual Parameter Pricing for Laboratory Services

| Analytical Parameter | # Samples | Frequency | USEPA Method | Unit Cost ** | Annual Cost + |
|---|-----------|-----------|--------------|--------------|---------------|
| Antimony | | | | \$ | \$ |
| Arsenic | | | | \$ | \$ |
| Barium | | | | \$ | \$ |
| Beryllium | | | | \$ | \$ |
| Cadmium | | | | \$ | \$ |
| Chromium | | | | \$ | \$ |
| Cobalt | | | | \$ | \$ |
| Copper | | | | \$ | \$ |
| Lead | | | | \$ | \$ |
| Mercury | | | | \$ | \$ |
| Nickel | | | | \$ | \$ |
| Selenium | | | | \$ | \$ |
| Silver | | | | \$ | \$ |
| Thallium | | | | \$ | \$ |
| Vanadium | | | | \$ | \$ |
| Zinc | | | | \$ | \$ |
| Acetone | | | | \$ | \$ |
| Acrylonitrile | | | | \$ | \$ |
| Benzene | | | | \$ | \$ |
| Bromochloromethane | | | | \$ | \$ |
| Bromodichloromethane | | | | \$ | \$ |
| Bromoform / Tribromomethane | | | | \$ | \$ |
| Carbon Disulfide | | | | \$ | \$ |
| Carbon Tetrachloride | | | | \$ | \$ |
| Chrolobenzene | | | | \$ | \$ |
| Chloroethane / Ethyl Chloride | | | | \$ | \$ |
| Chloroform / Trichloromethane | | | | \$ | \$ |
| Dibromochloromethane / Chlorodibromomethane | | | | \$ | \$ |

**Section I: Groundwater Monitoring Wells
Detail Worksheet 1.6
Ground Water Monitoring: Background Monitoring**

| Analytical Parameter | # Samples | Frequency | USEPA Method | Unit Cost ** | Annual Cost + |
|---|-----------|-----------|--------------|--------------|---------------|
| 1,2-Dibromo-3-Chloropropane / DBCP | | | | \$ | \$ |
| 1,2-Dibromomethane / Ethylene Dibromide / EDB | | | | \$ | \$ |
| o-Dichlorobenzene / 1,2-Dichlorobenzene | | | | \$ | \$ |
| p-Dichlorobenzene / 1,4-Dichlorobenzene | | | | \$ | \$ |
| trans-1,4-Dichloro-2-Butene | | | | \$ | \$ |
| 1,1-Dichloroethane / Ethylidene Chloride | | | | \$ | \$ |
| 1,2-Dichloroethane / Ethylidene Dichloride | | | | \$ | \$ |
| 1,1-Dichloroethylene / 1,1-Dichloroethene / Vinylidene Chloride | | | | \$ | \$ |
| cis-1,2-Dichloroethylene / cis-1,2-Dichloroethene | | | | \$ | \$ |
| trans-1,2-Dichloroethylene/trans-1,2-Dichloroethene | | | | \$ | \$ |
| 1,2-Dichloropropane, Propylene Dichloride | | | | \$ | \$ |
| cis-1,3-Dichloropropene | | | | \$ | \$ |
| trans-1,3-Dichloropropene | | | | \$ | \$ |
| Ethylbenzene | | | | \$ | \$ |
| 2-Hexanone / Methyl Butyl Ketone | | | | \$ | \$ |
| Methyl Bromide / Bromomethane | | | | \$ | \$ |
| Methyl Chloride / Chloromethane | | | | \$ | \$ |
| Methylene Bromide / Dibromomethane | | | | \$ | \$ |
| Methylene Chloride / Dichloromethane | | | | \$ | \$ |
| Methyl Ethyl Keytone / MEK / 2-Butanone | | | | \$ | \$ |
| Methyl Iodide / Iodomethane | | | | \$ | \$ |
| 4-Methyl-2-pentanone / Methyl Isobutyl Ketone | | | | \$ | \$ |
| Styrene | | | | \$ | \$ |
| 1,1,1,2-Tetrachloroethane | | | | \$ | \$ |
| 1,1,2,2-Tetrachloroethane | | | | \$ | \$ |
| Tetrachloroethylene / Tetrachloroehene / Perchloroethylene | | | | \$ | \$ |
| Toluene | | | | \$ | \$ |
| 1,1,1-Trichloroethane / Methylchloroform | | | | \$ | \$ |
| 1,1,2-Trichloroethane | | | | \$ | \$ |
| Trichloroethylene / Trichloroethene | | | | \$ | \$ |
| Trichloroflourmethane / CFC-11 | | | | \$ | \$ |
| 1,2,3-Trichloropropane | | | | \$ | \$ |

Post Closure Detail Worksheet

**Section I: Groundwater Monitoring Wells
Detail Worksheet 1.6
Ground Water Monitoring: Background Monitoring**

| Analytical Parameter | # Samples | Frequency | USEPA Method | Unit Cost ** | Annual Cost + |
|--|-----------|-----------|--------------|--------------|---------------|
| Vinyl Acetate | | | | \$ | \$ |
| Vinyl Chloride | | | | \$ | \$ |
| Xylenes | | | | \$ | \$ |
| Ammonia | | | | \$ | \$ |
| Chloride | | | | \$ | \$ |
| Sodium | | | | \$ | \$ |
| Chemical Oxygen Demand | | | | \$ | \$ |
| Temperature ++ | | | | \$ | \$ |
| pH++ | | | | \$ | \$ |
| Specific Conductance ++ | | | | \$ | \$ |
| Total Dissolved Solids | | | | \$ | \$ |
| Total Alkalinity | | | | \$ | \$ |
| Nitrate-Nitrite | | | | \$ | \$ |
| Sulfate | | | | \$ | \$ |
| Magnesium | | | | \$ | \$ |
| Calcium | | | | \$ | \$ |
| Potassium | | | | \$ | \$ |
| Turbidity | | | | \$ | \$ |
| Iron | | | | \$ | \$ |
| Manganese | | | | \$ | \$ |
| Total Organic Carbon | | | | \$ | \$ |
| Phenolics | | | | \$ | \$ |
| Cyanide | | | | \$ | \$ |
| Formaldehyde | | | | \$ | \$ |
| Fluoride | | | | \$ | \$ |
| Gross Alpha | | | | \$ | \$ |
| Gross Beta | | | | \$ | \$ |
| Total Annual Cost for Detail Worksheet 1.6* | | | | | \$ |

*** Insert Cost for Detail Worksheet 1.6 onto Post Closure Cost Estimate Cover Sheet, Section I, line f.**
(This sum is used in other worksheets (Closure Detail Worksheets 1.1 and 1.2, and Post Closure Worksheet 6.1))

** Costs to include field QA/QC (equipment blanks, field blanks, etc.) and lab QA/QC (trip blanks, duplicates, matrix spikes etc.)

+ Refer to the appropriate rules for the required parameters. If a parameter is not required, put "NR" as the Annual Cost.

++ Field Parameter

**Section III: Leachate Monitoring
Detail Worksheet 3.1
Annual Grab Sampling**

General information on the Authorizing Document

| | |
|--|--|
| Authorizing Document (NPDES permit, closure plan etc.) | |
| Effective Date | |

General Information on Analytical Services

| | |
|---|--|
| Name, Address and Contact for Laboratory | |
| Number of Leachate Sample Locations in Monitoring Program | |
| Number of Samples Collected per Sample Event | |
| Frequency of Sample Events (Annual Basis) | |

Option 1: Package Pricing for Laboratory Services

| | | |
|---|-----|----|
| Package Price for Trace Metals ** | *\$ | |
| Package Price for Volatile & Semivolatile Organic** | *\$ | |
| Package Price for Indicator Parameters ** | *\$ | |
| Package Price for Water Quality Parameters ** | *\$ | |
| Sum of Package Prices (Sum of above package prices) | | \$ |
| Number of Wells Requiring Initial Background Sampling | | |
| Frequency, Annual Basis (mimimum of one) | | |
| Total Samples Tested Annually (number of samples X frequency of samples) | | |
| Total Annual Cost for Post Closure Care Worksheet 3.1**** (Sum of Package Price X Total Samples Tested Annually) | | \$ |

* If package price (Option 1) is not reported, please use the totals for individual parameters (Option 2) as detailed below.

Option 2: Individual Parameter Pricing for Laboratory Services

| | Analytical Parameter | # Samples | Frequency | USEPA Method | Unit Cost | Annual Cost |
|--|----------------------|-----------|-----------|--------------|-----------|-------------|
|--|----------------------|-----------|-----------|--------------|-----------|-------------|

| Trace Metal Parameters | | | | | | |
|-------------------------------|-----------|--|--|--|----|----|
| 1 | Antimony | | | | \$ | \$ |
| 2 | Arsenic | | | | \$ | \$ |
| 3 | Barium | | | | \$ | \$ |
| 4 | Beryllium | | | | \$ | \$ |
| 5 | Cadmium | | | | \$ | \$ |
| 6 | Chromium | | | | \$ | \$ |
| 7 | Cobalt | | | | \$ | \$ |
| 8 | Copper | | | | \$ | \$ |

**Section III: Leachate Monitoring
Detail Worksheet 3.1
Annual Grab Sampling**

| | Analytical Parameter | # Samples | Frequency | USEPA Method | Unit Cost | Annual Cost |
|--|---|-----------|-----------|--------------|-----------|-------------|
| 9 | Lead | | | | \$ | \$ |
| 10 | Nickel | | | | \$ | \$ |
| 11 | Selenium | | | | \$ | \$ |
| 12 | Silver | | | | \$ | \$ |
| 13 | Thallium | | | | \$ | \$ |
| 14 | Vanadium | | | | \$ | \$ |
| 15 | Zinc | | | | \$ | \$ |
| Volatile and Semivolatile Organic Compounds** | | | | | | |
| 16 | Acetone | | | | \$ | \$ |
| 17 | Acrylonitrile | | | | \$ | \$ |
| 18 | Benzene | | | | \$ | \$ |
| 19 | Bromochloromethane | | | | \$ | \$ |
| 20 | Bromodichloromethane | | | | \$ | \$ |
| 21 | Bromoform / Tribromomethane | | | | \$ | \$ |
| 22 | Carbon disulfide | | | | \$ | \$ |
| 23 | Carbon tetrachloride | | | | \$ | \$ |
| 24 | Chrolobenzene | | | | \$ | \$ |
| 25 | Chloroethane / Ethyl chloride | | | | \$ | \$ |
| 26 | Chloroform / ZTrichloromethane | | | | \$ | \$ |
| 27 | Dibromochloromethane / Chlorodibromomethawne | | | | \$ | \$ |
| 28 | 1,2-DSibromo-3-chloropropane / DBCP | | | | \$ | \$ |
| 29 | 1,2-Dibromomethane / Ethylene dibromide / EDP | | | | \$ | \$ |
| 30 | o-Dichlorobenzene / 1,2-Dichlorobenzene | | | | \$ | \$ |
| 31 | p-Dichlorobenzene / 1,4-Dichlorobenzene | | | | \$ | \$ |
| 32 | trans-1,4-Dichloro-2-butene | | | | \$ | \$ |
| 33 | 1,1-Dichloroethane / Ethylidene chloride | | | | \$ | \$ |
| 34 | 1,2-Dichloroethane / Ethylidene dichloride | | | | \$ | \$ |
| 35 | 1,1-Dichloroethylene / 1,1-Dichloroethene | | | | \$ | \$ |
| 36 | cis-1,2-Dichloroethylene / cis-1,2-Dichloroethene | | | | \$ | \$ |
| 37 | trans-1,2-Dichloroethylene/trans-1,2-Dichloroethene | | | | \$ | \$ |
| 38 | 1,2-Dichloropropane, Propylene dichloride | | | | \$ | \$ |

Section III: Leachate Monitoring

**Detail Worksheet 3.1
Annual Grab Sampling**

Option 2: Individual Parameter Pricing for Laboratory Services - *continued*

| | Analytical Parameter | # Samples | Frequency | USEPA Method | Unit Cost | Annual Cost |
|-----------------------------------|---|-----------|-----------|--------------|-----------|-------------|
| 39 | cis-1,3-Dichloropropene | | | | \$ | \$ |
| 40 | trans-1,3-Dichloropropene | | | | \$ | \$ |
| 41 | Ethylbenzene | | | | \$ | \$ |
| 42 | 2-Hexanone / Methyl butyl ketone | | | | \$ | \$ |
| 43 | Methyl Bromide / Bromomethane | | | | \$ | \$ |
| 44 | Methyl chloride / Chloromethane | | | | \$ | \$ |
| 45 | Methylene Bromide / Dibromomethane | | | | \$ | \$ |
| 46 | Methylene chloride / Dichloromethane | | | | \$ | \$ |
| 47 | Methyl ethyl keytine / MEK / 2-Butanone | | | | \$ | \$ |
| 48 | Methyl iodide / iodomethane | | | | \$ | \$ |
| 49 | 4-Methyl-2-pentanone / Methyl isobutyl ketone | | | | \$ | \$ |
| 50 | Styrene | | | | \$ | \$ |
| 51 | 1,1,1,2-Tetrachloroethane | | | | \$ | \$ |
| 52 | 1,1,2,2-Tetrachloroethane | | | | \$ | \$ |
| 53 | Tetrachloroethylene / Perchloroethylene | | | | \$ | \$ |
| 54 | Toluene | | | | \$ | \$ |
| 55 | 1,1,1-Trichloroethane / Methylchloroform | | | | \$ | \$ |
| 56 | 1,1,2-Trichloroethane | | | | \$ | \$ |
| 57 | Trichloroethylene / Trichloroethene | | | | \$ | \$ |
| 58 | Trichloroflourmethane / CFC-11 | | | | \$ | \$ |
| 59 | 1,2,3-Trichloropropane | | | | \$ | \$ |
| 60 | Vinyl acetate | | | | \$ | \$ |
| 61 | Vinyl chloride | | | | \$ | \$ |
| 62 | Xylenes | | | | \$ | \$ |
| Indicator Parameters** | | | | | | |
| 63 | Ammonia | | | | \$ | \$ |
| 64 | Chloride | | | | \$ | \$ |
| 65 | Sodium | | | | \$ | \$ |
| 66 | Chemical oxygen demand | | | | \$ | \$ |
| 67 | Temperature | | | | \$ | \$ |
| 68 | pH | | | | \$ | \$ |
| 69 | Specific conductance | | | | \$ | \$ |
| Water Quality Parameters** | | | | | | |
| 70 | Total dissolved solids | | | | \$ | \$ |

Post Closure Care Detail Worksheet
Section III: Leachate Monitoring

Detail Worksheet 3.1
Annual Grab Sampling

Option 2: Individual Parameter Pricing for Laboratory Services - *continued*

| | Analytical Parameter | # Samples | Frequency | USEPA Method | Unit Cost | Annual Cost |
|--|----------------------|-----------|-----------|--------------|-----------|-------------|
|--|----------------------|-----------|-----------|--------------|-----------|-------------|

| | | | | | | |
|--|------------------|--|--|--|----|-----------|
| 71 | Total alkalinity | | | | \$ | \$ |
| 72 | Nitrate-nitrite | | | | \$ | \$ |
| 73 | Sulfate | | | | \$ | \$ |
| 74 | Magnesium | | | | \$ | \$ |
| 75 | Calcium | | | | \$ | \$ |
| 76 | Potassium | | | | \$ | \$ |
| 77 | Turbidity | | | | \$ | \$ |
| 78 | Iron | | | | \$ | \$ |
| 79 | Manganese | | | | \$ | \$ |
| Total Annual Cost for Detail Worksheet 3.1*** | | | | | | \$ |

***** Insert Cost for Detail Worksheet 3.1 onto Post Closure Cost Estimate Cover Sheet Section III, line a.**

** Costs to include field QA/QC (equipment blanks, field blanks, etc.) and lab QA/QC (trip blanks, duplicates, matrix spikes etc.)

Section III: Leachate Monitoring

**Detail Worksheet 3.2
Testing for Special Constituents**

General information on the Authorizing Document

| | |
|--|--|
| Authorizing Document (NPDES permit, closure plan etc.) | |
| Effective Date | |

General Information on Analytical Services

| | |
|---|--|
| Name, Address and Contact for Laboratory | |
| Number of Leachate Sample Locations in Monitoring Program | |
| Number of Samples Collected per Sample Event | |
| Frequency of Sample Events (Annual Basis) | |

Individual Parameters

| | Analytical Parameter** | # Samples | Frequency | USEPA Method | Unit Cost | Annual Cost |
|----|------------------------|-----------|-----------|--------------|-----------|-------------|
| 1 | | | | | \$ | \$ |
| 2 | | | | | \$ | \$ |
| 3 | | | | | \$ | \$ |
| 4 | | | | | \$ | \$ |
| 5 | | | | | \$ | \$ |
| 6 | | | | | \$ | \$ |
| 7 | | | | | \$ | \$ |
| 8 | | | | | \$ | \$ |
| 9 | | | | | \$ | \$ |
| 10 | | | | | \$ | \$ |
| 11 | | | | | \$ | \$ |
| 12 | | | | | \$ | \$ |
| 13 | | | | | \$ | \$ |
| 14 | | | | | \$ | \$ |
| 15 | | | | | \$ | \$ |

Attach additional sheets as necessary.

| | |
|--|----|
| Total Annual Cost for Detail Worksheet 3.2* | \$ |
|--|----|

*** Insert Cost for Detail Worksheet 3.2 onto Post Closure Estimate Cover Sheet Section III, line b.**

** Costs to include field QA/QC (equipment blanks, field blanks, etc.) and lab QA/QC (trip blanks, duplicates, matrix spikes, etc.)

Section IV: Surface Water Monitoring

Detail Worksheet 4.1

Sampling per NPDES Permit, Closure Plan, or Other Authorizing Document

General information on the Authorizing Document

| | |
|--|--|
| Authorizing Document (NPDES permit, closure plan etc.) | |
| Effective Date | |

General Information on Analytical Services

| | |
|--|--|
| Name, Address and Contact for Laboratory | |
| Number of Surface Water Sample Locations in Monitoring Program | |
| Number of Samples Collected per Sample Event | |
| Frequency of Sample Events (Annual Basis) | |

Individual Parameters

| | Analytical Parameter** | # Samples | Frequency | USEPA Method | Unit Cost | Annual Cost |
|----|------------------------|-----------|-----------|--------------|-----------|-------------|
| 1 | | | | | \$ | \$ |
| 2 | | | | | \$ | \$ |
| 3 | | | | | \$ | \$ |
| 4 | | | | | \$ | \$ |
| 5 | | | | | \$ | \$ |
| 6 | | | | | \$ | \$ |
| 7 | | | | | \$ | \$ |
| 8 | | | | | \$ | \$ |
| 9 | | | | | \$ | \$ |
| 10 | | | | | \$ | \$ |
| 11 | | | | | \$ | \$ |
| 12 | | | | | \$ | \$ |
| 13 | | | | | \$ | \$ |
| 14 | | | | | \$ | \$ |
| 15 | | | | | \$ | \$ |

Attach additional sheets as necessary.

| | |
|--|----|
| Total Annual Cost for Detail Worksheet 4.1* | \$ |
|--|----|

***Insert Cost for Detail Worksheet 4.1 onto Post Closure Estimate Cover Sheet, Section IV, line a.**

** Costs to include field QA/QC (equipment blanks, field blanks, etc.) and lab QA/QC (trip blanks, duplicates, matrix spikes etc.)

**Section V: Operation and Maintenance of Leachate Collection and Treatment System
Detail Worksheets 5.1 and 5.2**

**Detail Worksheet 5.1
Off-Site Disposal of Leachate**

| | |
|---|--|
| Specify disposal site & NPDES permit # | |
| Transportation radius in miles | |

| | Item | Annual Quantity | Unit Cost | Annual Cost |
|---|----------------------------------|------------------------|------------------|--------------------|
| 1 | Transportation Cost (unit:_____) | | \$ | \$ |
| 2 | Disposal Cost (GAL) | | \$ | \$ |
| 3 | Characterization (unit:_____) | | \$ | \$ |
| Total Annual Cost for Detail Worksheet 5.1 * | | | | \$ |

*** Insert Cost for Detail Worksheet 5.1 onto Post Closure Cost Estimate Cover Sheet Section V, line j.**

**Detail Worksheet 5.2
On-Site Treatment and/or Pretreatment of Leachate**

| | |
|---|--|
| Specify disposal site & NPDES permit # | |
|---|--|

| | Item | Annual Quantity | Unit Cost | Annual Cost |
|---|--------------------------------|------------------------|------------------|--------------------|
| 1 | Chemical Treatment (GAL or CF) | | \$ | \$ |
| 2 | Clarification (GAL or CF) | | \$ | \$ |
| 3 | Aeration (GAL or CF) | | \$ | \$ |
| 4 | Other Treatment (GAL or CF) | | \$ | \$ |
| 5 | Operating Costs (GAL or CF) | | \$ | \$ |
| Total Annual Cost for Detail Worksheet 5.2** | | | | \$ |

**** Insert Cost for Detail Worksheet 5.2 onto Post Closure Cost Estimate Cover Sheet Section V, line k.**

Section VI: Operation & Maintenance of Ground Water Monitoring Wells

Detail Worksheet 6.1

Ground Water Monitoring Well System Repair & Replacement

Monitoring Well System Detail

| | |
|---------------------------------|---|
| Number of Wells at Site: | |
| Construction: | PVC <input type="checkbox"/> Other <input type="checkbox"/> |
| Design Life | |

For Informational Purposes Only:

| | | | |
|----------------------------------|----------|----------|----------|
| Well Depth (ft) | Maximum: | Minimum: | Average: |
| Well Screen Interval (ft) | Maximum: | Minimum: | Average: |
| Boring & Coring (ft) | Maximum: | Minimum: | Average: |
| Well Diameter (inches) | Maximum: | Minimum: | Average: |

Well Repair and Replacement (Per well basis, based on maximum well depth/ diameter)

| | Item | Annual Quantity** | Unit Cost | Annual Average Cost |
|--|---|--------------------------|------------------|----------------------------|
| 1 | Mobilization / Demobilization (LS) | | \$ | \$ |
| 2 | Old Well Removal & Abandonment (EA) | | \$ | \$ |
| 3 | Well Installation (includes equipment, labor, and materials) (EA) | | \$ | \$ |
| 4 | Well Development (EA) | | \$ | \$ |
| 5 | Background Sampling (EA) <small>See Post Closure Detail Worksheet 1.6</small> | | \$ | \$ |
| 6 | QA/QC & Certification (EA) | | \$ | \$ |
| Total Annual Average Cost for Detail Worksheet 6.1* | | | | \$ |

***Insert Cost for Detail Worksheet 6.1 onto Post Closure Cost Estimate Cover Sheet, Section VI, line b.**

$$\text{Annual Quantity**} = \frac{\text{Total Number of Wells at the Site}}{\text{Well Design Life (in Years)}}$$

** Minimum annual quantity is two percent (.02) of all units installed at the site (wells, piping, etc...) on an annual basis

Section VII: Operation and Maintenance of Explosive Gas Extraction and/ or Control System

**Detail Worksheet 7.1
Extraction Well Repair & Replacement**

Monitoring Well System Summary

| | |
|--|---|
| Number of Extraction Wells at Site: | |
| Construction: | PVC <input type="checkbox"/> Other (Specify) _____ <input type="checkbox"/> |

| | | | |
|----------------------------------|----------|----------|----------|
| Well Depth (ft) | Maximum: | Minimum: | Average: |
| Well Screen Interval (ft) | Maximum: | Minimum: | Average: |
| Gravel Pack Diameter (ft) | Maximum: | Minimum: | Average: |
| Well Diameter (inches) | Maximum: | Minimum: | Average: |

Well Repair and Replacement (Per well basis, based upon maximum depth and diameter)

| | Item | Design Life | Annual Quantity** | Unit Cost | Annual Cost |
|--|---|--------------------|--------------------------|------------------|--------------------|
| 1 | Mobilization / Demobilization (LS) | | | \$ | \$ |
| 2 | Old Well Removal & Abandonment (EA) | | | \$ | \$ |
| 3 | Well Installation (includes materials, equipment and labor) (EA) | | | \$ | \$ |
| 4 | Well Development & Balancing (EA) | | | \$ | \$ |
| 5 | Geomembrane Boot Installation (EA) | | | \$ | \$ |
| 6 | Cap Repair (EA) | | | \$ | \$ |
| 7 | Valves and Fittings (EA) | | | \$ | \$ |
| 8 | QA/QC & Certification (EA) | | | \$ | \$ |
| Total Annual Cost for Detail Worksheet 7.1* | | | | | \$ |

*** Insert Cost for Detail Worksheet 7.1 onto Post Closure Estimate Cover Sheet Section VII, line a.**

$$\text{Annual Quantity}^{**} = \frac{\text{Total Number of Wells at the Site}}{\text{Well Design Life (in Years)}}$$

** Minimum annual quantity is two percent (.02) of all units installed at the site (wells, LF piping, etc...) on an annual basis. Design life should be based upon actual site experience or manufacturer's specified operating life, whichever is less.

Section VII: Operation and Maintenance of Explosive Gas Extraction and/ or Control System

**Detail Worksheet 7.2
Collection System Repair & Replacement**

Gas Collection System Summary:

| | |
|----------------------------------|-------------------------------|
| Above Grade Headers(LF): | |
| Below Grade Headers (LF): | |
| Total Valves (EA): | |
| Construction: | PVC 9 Other (Specify) _____ 9 |

| | | | |
|--|----------|----------|----------|
| Header Piping Diameter (ft) | Maximum: | Minimum: | Average: |
| Collection Piping Diameter (ft) | Maximum: | Minimum: | Average: |

Collection System Repair and Replacement (Based upon maximum depth and diameter)

| | Item | Design Life | Annual Quantity** | Unit Cost | Annual Cost |
|--|---|--------------------|--------------------------|------------------|--------------------|
| 1 | Mobilization / Demobilization (LS) | | | \$ | \$ |
| 2 | Pipes (LF) | | | \$ | \$ |
| 3 | Removal & Abandonment (LF) | | | \$ | \$ |
| 4 | Pipe Repair & Installation (includes equipment and labor) (LF) | | | \$ | \$ |
| 5 | System Development & Balancing (LS) | | | \$ | \$ |
| 6 | Pumps (EA) | | | \$ | \$ |
| 7 | Pump Replacement (EA) | | | \$ | \$ |
| 8 | Tank / Storage Repair and Replacement (EA) | | | \$ | \$ |
| 9 | Cap Repair (LS) | | | \$ | \$ |
| 10 | Valves & Fittings (EA) | | | \$ | \$ |
| 11 | QA/QC & Certification (LS) | | | \$ | \$ |
| Total Annual Cost for Detail Worksheet 7.2* | | | | | \$ |

*Insert cost for detail worksheet 7.2 onto Post Closure Cost Estimate Cover Sheet Section VII, line b.

$$\text{Annual Quantity}^{**} = \frac{\text{Total Number of Units at the Site (in Units)}}{\text{Unit Design Life (in Years)}}$$

** Minimum annual quantity is two percent (.02) of all units installed at the site (wells, LF of piping, etc...) on an annual basis. Design life should be based upon actual site experience or manufacturer's specified operating life, whichever is less.

Section VII: Explosive Gas Collection and Control System

Detail Worksheet 7.3

Flare System Repair & Replacement

Flare System Summary

| | |
|---|---------------------------|
| Size of Flare System (Rated Capacity (MCF/HR): | |
| Number of Flares: | |
| Flare Air Permit Number: | |
| Type of Flare: | |
| Blowers: | Number: _____ Type: _____ |
| Motors: | Number: _____ Type: _____ |
| Rated Capacity (SCFM): | |
| Rated Capacity (HP): | |

Flare System Repair & Replacement (Based on maximum component size and capacity)

| | Item | Design Life | Annual Quantity** | Unit Cost | Annual Cost |
|--|--|--------------------|--------------------------|------------------|--------------------|
| 1 | Mobilization / Demobilization (LS) | | | \$ | \$ |
| 2 | Flow Meter Replacement (EA) | | | \$ | \$ |
| 3 | Blower Replacement (EA) | | | \$ | \$ |
| 4 | Motor Replacement (EA) | | | \$ | \$ |
| 5 | Flame Arrester Replacement (EA) | | | \$ | \$ |
| 6 | Mist Eliminator / Knockout Pot Replacement (EA) | | | \$ | \$ |
| 7 | Flare Assembly Replacement (EA) | | | \$ | \$ |
| 8 | Instrumentation (LS) | | | \$ | \$ |
| 9 | Propane Supplemental Fuel System (LS) | | | \$ | \$ |
| 10 | Valves & Fittings (EA) | | | \$ | \$ |
| 11 | QA/QC & Certification (LS) | | | \$ | \$ |
| Total Annual Cost for Detail Worksheet 7.3* | | | | | \$ |

***Insert cost for detail worksheet 7.3 onto Post Closure Cost Estimate Cover Sheet Section VII, line c.**

$$\text{Annual Quantity}^{**} = \frac{\text{Total Number of Units at the Site (in Units)}}{\text{Unit Design Life (in Years)}}$$

** Minimum annual quantity is two percent (.02) of all units installed at the site (wells, LF of piping, etc...) on an annual basis. Design life should be based upon actual site experience or manufacturer's specified operating life, whichever is less.

Section VII: Operation and Maintenance of Explosive Gas Extraction and/ or Control System

**Detail Worksheet 7.4
Air Emissions Monitoring (NSPS and OAC 3745-76)**

General information on the Authorizing Document

| | |
|--|--|
| Authorizing Document (Air permit, closure plan etc.) | |
| Effective Date | |

Monitoring Well System Summary

| | |
|---|--|
| Number of Extraction Wells at Site: | |
| Date Gas Extraction System went on line | |
| Calculated Date of Closure | |

Air Emissions Monitoring

| | Item | Annual Quantity | Unit Cost | Annual Cost |
|--|---|-----------------|-----------|-------------|
| 1 | Monthly monitoring of gas extraction wells (Nitrogen or Oxygen, Temperature, and Pressure) (per well) | | \$ | \$ |
| 2 | NMOC Monitoring of Header pipe (per header pipe) | | \$ | \$ |
| Total Annual Cost for Detail Worksheet 7.4* | | | | \$ |

***Insert Cost for Detail Worksheet 7.4 onto Summary Post Closure Cover Sheet Section VII, line d.**

NOTE: Monthly monitoring and NMOC monitoring must be maintained for at least 15 years past the initial start date of the gas extraction system. If the facility installed the extraction system during landfill operations, the post closure care amount at a minimum, should be calculated as the number of years past closure until the fifteen year deadline.

Section V: Explosive Gas Extraction and/ or Control System

Detail Worksheet 7.5

Special Controls and Conveyance Structure Repair & Replacement

Description of Special Controls and Conveyance Structures - For informational purposes only

Include a description of any systems included in the beneficial use of landfill gases which is integral to landfill operations during closure and post-closure care. Examples include on-site electrical generation and leachate evaporation. Specific components will be site-specific. Include only those systems which are necessary to operate mechanical systems essential to the proper operations of the landfill. Systems which provide revenue opportunities should not be included.

Components of Special Controls and Conveyance Structures

| | Item | Design Life | Annual Quantity** | Unit Cost | Item Cost |
|--|----------------------------------|--------------------|--------------------------|------------------|------------------|
| 1 | Mobilization/Demobilization (LS) | | | \$ | \$ |
| 2 | Materials | | | \$ | \$ |
| 3 | Installation | | | \$ | \$ |
| 4 | Repair & Replacement | | | \$ | \$ |
| 5 | QA/QC & Certification (LS) | | | \$ | \$ |
| 6 | | | | \$ | \$ |
| 7 | | | | \$ | \$ |
| 8 | | | | \$ | \$ |
| 9 | | | | \$ | \$ |
| 10 | | | | \$ | \$ |
| Total Annual Cost for Detail Worksheet 7.5* | | | | | \$ |

***Insert cost for detail worksheet 7.5 onto Post Closure Cost Estimate Cover Sheet Section VII, line e.**

$$\text{Annual Quantity}^{**} = \frac{\text{Total Number of Units at the Site (in Units)}}{\text{Unit Design Life (in Years)}}$$

** Minimum annual quantity is two percent (.02) of all units installed at the site (wells, LF of piping, etc...) on an annual basis. Design life should be based upon actual site experience or manufacturer's specified operating life, whichever is less.

Section VIII: Explosive Gas Monitoring System Repair and Replacement

**Detail Worksheet 8.1
Monitoring Probe Repair and Replacement**

Monitoring Probe System Summary

| | |
|---|--|
| Number of Gas Monitoring Probes at Site: | |
| Construction: | PVC <input type="checkbox"/> Other (Specify): _____ <input type="checkbox"/> |
| Design Life | |

| | | | |
|-----------------------------------|----------|----------|----------|
| Probe Depth (ft) | Maximum: | Minimum: | Average: |
| Probe Screen Interval (ft) | Maximum: | Minimum: | Average: |
| Gravel Pack Diameter (ft) | Maximum: | Minimum: | Average: |
| Probe Diameter (inches) | Maximum: | Minimum: | Average: |

Well Repair and Replacement (Per well basis, based upon maximum depth and diameter)

| | Item | Annual Quantity** | Unit Cost | Annual Cost |
|---|---|--------------------------|------------------|--------------------|
| 1 | Mobilization / Demobilization (LS) | | \$ | \$ |
| 2 | Old Probe Removal & Abandonment (EA) | | \$ | \$ |
| 3 | Probe Installation (includes equipment, labor, and materials) (EA) | | \$ | \$ |
| 4 | QA/QC & Certification (LS) | | \$ | \$ |
| Total Annual Cost for Detail Worksheet 8.1 * | | | | \$ |

***Insert cost for detail worksheet 8.1 onto Post Closure Cost Estimate Cover Sheet Section VIII, line b.**

$$\text{Annual Quantity}^{**} = \frac{\text{Total Number of Probes at the Site}}{\text{Probe Design Life (in Years)}}$$

** Minimum annual quantity is two percent (.02) of all probes installed at the site on an annual basis. Assume a minimum annual cost of two (2) percent of the cost of the installed explosive gas monitoring probes or actual site experience, whichever is greater.

Section VIII: Explosive Gas Monitoring System Repair and Replacement

**Detail Worksheet 8.2
Alarm Repair and Replacement**

Monitoring Alarm Summary:

| | |
|---|--|
| Number of Monitoring Alarms at Site: | |
| Design Life | |

Monitoring Alarm Repair and Replacement

| | Item | Annual Quantity** | Unit Cost | Annual Cost |
|--|--|--------------------------|------------------|--------------------|
| 1 | Mobilization / Demobilization (LS) | | \$ | \$ |
| 2 | Alarm Repair & Replacement (EA) | | \$ | \$ |
| 3 | QA/QC & Certification (LS) | | \$ | \$ |
| Total Annual Cost for Detail Worksheet 8.2* | | | | \$ |

***Insert cost for detail worksheet 8.2 onto Post Closure Cost Estimate Cover Sheet Section VIII, line c.**

$$\text{Annual Quantity}^{**} = \frac{\text{Total Number of Probes at the Site}}{\text{Probe Design Life (in Years)}}$$

** Minimum annual quantity is two percent (.02) of all probes installed at the site on an annual basis. Assume a minimum annual cost of two (2) percent of the cost of the installed explosive gas monitoring probes or actual site experience, whichever is greater.

Section VIII: Explosive Gas Monitoring System Repair and Replacement

**Detail Worksheet 8.1
Monitoring Probe Repair and Replacement**

Monitoring Probe System Summary

| | |
|---|--|
| Number of Gas Monitoring Probes at Site: | |
| Construction: | PVC <input type="checkbox"/> Other (Specify): _____ <input type="checkbox"/> |
| Design Life | |

| | | | |
|-----------------------------------|----------|----------|----------|
| Probe Depth (ft) | Maximum: | Minimum: | Average: |
| Probe Screen Interval (ft) | Maximum: | Minimum: | Average: |
| Gravel Pack Diameter (ft) | Maximum: | Minimum: | Average: |
| Probe Diameter (inches) | Maximum: | Minimum: | Average: |

Well Repair and Replacement (Per well basis, based upon maximum depth and diameter)

| | Item | Annual Quantity** | Unit Cost | Annual Cost |
|---|---|--------------------------|------------------|--------------------|
| 1 | Mobilization / Demobilization (LS) | | \$ | \$ |
| 2 | Old Probe Removal & Abandonment (EA) | | \$ | \$ |
| 3 | Probe Installation (includes equipment, labor, and materials) (EA) | | \$ | \$ |
| 4 | QA/QC & Certification (LS) | | \$ | \$ |
| Total Annual Cost for Detail Worksheet 8.1 * | | | | \$ |

***Insert cost for detail worksheet 8.1 onto Post Closure Cost Estimate Cover Sheet Section VIII, line b.**

$$\text{Annual Quantity}^{**} = \frac{\text{Total Number of Probes at the Site}}{\text{Probe Design Life (in Years)}}$$

** Minimum annual quantity is two percent (.02) of all probes installed at the site on an annual basis. Assume a minimum annual cost of two (2) percent of the cost of the installed explosive gas monitoring probes or actual site experience, whichever is greater.

Section VIII: Explosive Gas Monitoring System Repair and Replacement

**Detail Worksheet 8.2
Alarm Repair and Replacement**

Monitoring Alarm Summary:

| | |
|---|--|
| Number of Monitoring Alarms at Site: | |
| Design Life | |

Monitoring Alarm Repair and Replacement

| | Item | Annual Quantity** | Unit Cost | Annual Cost |
|--|--|--------------------------|------------------|--------------------|
| 1 | Mobilization / Demobilization (LS) | | \$ | \$ |
| 2 | Alarm Repair & Replacement (EA) | | \$ | \$ |
| 3 | QA/QC & Certification (LS) | | \$ | \$ |
| Total Annual Cost for Detail Worksheet 8.2* | | | | \$ |

***Insert cost for detail worksheet 8.2 onto Post Closure Cost Estimate Cover Sheet Section VIII, line c.**

$$\text{Annual Quantity}^{**} = \frac{\text{Total Number of Probes at the Site}}{\text{Probe Design Life (in Years)}}$$

** Minimum annual quantity is two percent (.02) of all probes installed at the site on an annual basis. Assume a minimum annual cost of two (2) percent of the cost of the installed explosive gas monitoring probes or actual site experience, whichever is greater.