Appendix R

Closure and Post-Closure Plan

Ameren Missouri Labadie Energy Center

Closure and Post-Closure Plan for a Proposed Utility Waste Landfill Franklin County, Missouri

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1.0 Introduction

This Closure and Post-Closure Plan provides the criteria necessary to properly close and maintain the Ameren Missouri Labadie Utility Waste Landfill (UWL), owned and operated by Ameren Missouri. This plan includes the methods and schedule anticipated to properly close the entire landfill during or at the end of its operating life. Following closure of any portion of the landfill, 20-year post-closure maintenance requirements will be initiated. Estimated costs for completing closure and post-closure activities described herein are included to provide a basis for assuring that sufficient funds are available to complete the necessary activities. According to 10 CSR 80-2.030 (4)(B)2.D, utility waste landfills are not required to provide a post-closure financial assurance instrument (FAI).

The following Missouri Department of Natural Resources (MDNR) Technical Bulletins were utilized to prepare the Closure and Post-Closure Plan and are included as Appendices 1 and 2:

- Landfill Closure Guidance, 6/2006
- Preparing Solid Waste Disposal Area Closure and Post-Closure Plans, 6/2006

2.0 Closure Plan

2.1 Closure Plan Sequencing

The Missouri Department of Natural Resources and Franklin County will be notified in writing at least 180 days prior to the anticipated last receipt of waste in a phase of the landfill. The owner will make provisions to begin closure within 30 days of receiving final waste and will complete closure within 180 days of beginning closure on the landfill. Table 1 details the construction sequence for the landfill, which will be completed in 4 phases.

TABLE 1

Phase Number	Cell Number	Disposal Acreage	Planned Use
Phase 1	Cell 1	31.4 ac	Utility Waste Disposal
Phase 2	Cell 2	35.2 ac	Utility Waste Disposal
Phase 3	Cell 3	57.1 ac	Utility Waste Disposal
Phase 4	Cell 4	42.8 ac	Utility Waste Disposal
Total		**166.5 ac**	

Prior to requesting authorization to operate, Ameren Missouri will execute an easement with MDNR that grants MDNR, its agents, or its contractors access to the permitted area to complete work specified in the closure plan, to monitor or maintain the utility waste disposal area, and/or to take remedial action during the post-closure period [10 CSR 80-2.020(2)(B)2.A]. Ameren Missouri will also submit evidence to MDNR that a notice and covenant running with the land

has been recorded with the recorder of deeds in Franklin County. The notice and covenant will specify all items outlined in 10 CSR 80-2.020(2)(B)2.B(I)&(II). A copy of the Draft Agreements for Easement, Notice and Covenant Running with Land are provided in Appendix 3.

Following completion of closure activities, a letter and supporting documentation will be submitted to MDNR and Franklin County by an independent professional engineer registered in the State, verifying that closure activities have been completed in accordance with the closure plan and applicable laws and regulations. After MDNR and Franklin County approve closure of the landfill and the final survey plat, the survey plat identifying the boundaries and existence of the landfill will be recorded within 30 days with the Franklin County Recorder of Deeds. Two copies of the recorded plat will also be submitted to MDNR within 30 days of the filing with the Franklin County Recorder of Deeds.

2.2 Closure Activities

The required closure activities will consist of construction of the final cover, and construction of storm water control structures. Each of these closure activities will be completed according to the approved permit documents, including the Construction Permit Application and associated Plan Sheets and the Construction Quality Assurance Plan. The closure activities are discussed and detailed in the following sections of the Construction Permit Application and/or Plan Sheets:

1.) Landfill Final Cover	Section 3.12, Landfill Final Cover
	Section 4.9, Final Cover Material
	Plan Sheets 10, 11, 12, 13, 14 and 15
2.) Stormwater Runoff Controls	Section 3.7, Stormwater Management System
	Section 4.5.1, Stormwater Management
	Plan Sheets 16 and 21
	Appendix N

Ameren Missouri has the required quantity of soil suitable for construction of the final cap on their property. At closure, all soil will be obtained from on-site stockpiles or other areas within the permit boundary. The right of MDNR to utilize such soil for construction of the final cap and closure of the landfill will be provided through a binding, legal agreement between MDNR and Ameren Missouri, prior to issuance of the operating permit. The estimated average round trip distance from the soil borrow source to the landfill is less than 0.5 miles. A seed mixture compliant with MDNR's "Landfill Closure Guidance" (Appendix 1) will be used for vegetation on the final cover system.

2.3 Closure Cost Estimate

The purpose of closure cost assurance for landfills is to assure that sufficient funds are available to properly construct the final cover, establish vegetation, provide for erosion and drainage control and provide a pleasing appearance during the operating life of the landfill. The estimated costs for completing closure activities have been derived from the Closure and Post-Closure Cost Worksheet obtained from the MDNR Solid Waste Management Program website (http://www.dnr.mo.gov/forms/index.html). As indicated on the worksheet, the cost estimates or unit costs utilized in the calculations are in 2004 dollars. Costs are adjusted to third quarter 2012 dollars using the latest Implicit Price Deflators for Gross Domestic Product as determined by the U.S. Bureau of Economic Analysis.

Franklin County does not currently have closure and post-closure requirements for a UWL. For this reason, the requirements of 260.226 and 260.227 RSMo were used for the development of the plans and associated cost estimates.

The worksheets used to estimate the closure costs are included in Appendix 4. The closure cost estimate contained in Appendix 4A represents the maximum amount of closure financial assurance needed for the entire landfill. The cost of closing the entire 166.5-acre landfill is estimated to be $14,370,758. This cost represents the maximum amount of closure assurance needed if all cells of the landfill are open when the last volume of utility waste is deposited in the landfill.

Appendices 4B through 4E present the individual closure cost estimates for Phases 1, 2, 3, and 4. The individual phase cost estimates may be used to initially decrease the FAI and then incrementally increase the amount of the closure FAI throughout the operating life of the utility waste landfill.

3.0 Post-Closure Plan

3.1 Post-Closure Timeframe

This Post-Closure Plan includes the maintenance and monitoring activities to be performed at the landfill after closure. The post-closure maintenance period begins when MDNR agrees that the landfill, or a Phase of the landfill, has been properly closed. Post-closure maintenance will continue for 20 years from the date of final closure of the Phase or the landfill.

3.2 Post-Closure Activities

Post-closure care will include performance of the following activities:

1.) Maintenance of cover integrity, vegetative growth to protect the cover material, and the surface water control system

2.) Maintenance, sampling, testing and statistical analysis of the groundwater monitoring wells

Each of these post-closure activities will be completed according to the conditions of the permits and the approved permit documents. The post-closure activities are discussed and detailed in the following sections of the Construction Permit Application:

1.) Landfill Final Cover, Section 3.12 and Section 4.9, Final Cover Material
2.) Stormwater Management System, Section 3.7 and Section 4.5.1, Stormwater Management
3.) Groundwater Monitoring, Section 3.10 and Section 4.5.3, Groundwater Sampling and Analysis Plan

3.3 Post-Closure Cost Estimate

Per 10 CSR 80-2.030(4)(B)2.D, post-closure financial assurance is not required for utility waste landfills. However, Ameren Missouri has voluntarily agreed to provide a 20-year post-closure FAI for continued groundwater monitoring and evaluation during post-closure.

The purpose of the post-closure cost assurance for the Ameren Missouri Labadie Utility Waste Landfill is to assure that sufficient funds are available to maintain and test the groundwater monitoring system. The estimated cost for completing this post-closure care has been derived from the Closure and Post-Closure Cost Worksheet contained in the MDNR Solid Waste Management Program Technical Bulletin entitled "Preparing Solid Waste Disposal Area Closure and Post-Closure Plans", dated June 2006. The cost estimate or unit costs utilized in the calculations are in year 2004 dollars and adjusted to 2012 dollars.

Franklin County currently does not have a closure and post-closure requirements for a UWL. For this reason, the requirements of 260.226 and 260.227 RSMo were used for the development of the plans and associated cost estimate.

The worksheets used to estimate the closure and post-closure costs are included in Appendix 4. The post-closure cost estimate represents the maximum amount of post-closure financial assurance needed for the entire landfill. The cost of post-closure care for the entire 166.5-acre landfill is estimated to be $1,650,217.20. This cost represents the maximum amount of post-closure assurance needed for 20 years if all cells of the landfill are closed.

Appendix 4 also presents the individual closure and post-closure cost estimates for Phases 1, 2, 3, and 4. However, the cost for post-closure groundwater monitoring and evaluation are inseparable annual costs that will be fully funded prior to the operation of Phase 1.

3.4 Record Keeping

During the post-closure period, please contact Ameren Missouri, 1901 Chouteau Avenue, P.O. Box 66149, St. Louis, Missouri, 63166, (314) 554-2388, regarding any questions or issues with the landfill. Also during this period, all landfill records will be maintained by Ameren Missouri at the same address.

4.0 Remedial Action

If Ameren Missouri is required to develop a corrective action plan for the landfill during the life of the landfill or during the post-closure period, associated cost estimates will be prepared and a corresponding FAI will be secured.

5.0 Financial Assurance Instrument

Ameren Missouri may choose to provide financial assurance incrementally for closure and post-closure based on the closure and post-closure costs for each landfill construction phase as outlined below:

Closure:

Phase 1 (31.4 acres):	$2,710,161
Phase 2 (35.2 acres):	$3,038,142
Phase 3 (57.1 acres):	$4,928,350
Phase 4 (42.8 acres):	$3,694,105
Total Closure (166.5 acres):	$14,370,758

Post-Closure:

Total Post-Closure (166.5 acres for 20 years): $1,650,217 *

*Ameren Missouri has voluntarily agreed to provide a 20-year post-closure FAI for continued groundwater monitoring and evaluation during post-closure.

TOTAL Closure and Post-Closure:

Total Closure and Post-Closure (166.5 acres): FAI = $16,020,975

The closure and post-closure cost estimates presented above are adjusted to third quarter 2012 values, as calculated in Appendix 4. The cost estimate will be reviewed every year to adjust the estimate based on the previous year's inflation rate. The results of the annual review will be submitted to the MDNR along with any recommendation for revising the amount required for

closure and post-closure financial assurance funding. If changes in the design or operation of the landfill are made at a future date, the closure and post-closure plan and cost estimate will be reviewed at that time. If modifications to the plan are necessary, the revised closure and/or post-closure plan will be submitted to the MDNR along with the revised FAI.

In accordance with Utility Waste Regulation 10 CSR 80-2.030(4)(D), a FAI for closure and post-closure care may be satisfied by one of the following alternatives: trust fund or escrow account, financial guarantee bond or performance bond, irrevocable letter of credit, insurance policy, or corporate guarantee. Ameren Missouri will provide a suitable FAI prior to obtaining the initial construction permit. The FAI will be adjusted annually for inflation.

APPENDICES

Appendix 1

MDNR "Landfill Closure Guidance" Technical Bulletin, dated 6/2006

Missouri Department of Natural Resources

Landfill Closure Guidance

Solid Waste Management Program technical bulletin 6/2006

The Missouri Department of Natural Resources' Solid Waste Management Program (SWMP) has developed this technical bulletin to provide assistance to landfill owners, operators and engineers in obtaining closure approval from the department. This bulletin was prepared to provide guidance for closure under Missouri Solid Waste Management law and rules.

All owners or operators applying for closure approval must have a department approved closure/post-closure plan. For further information regarding the preparation of closure/post-closure plans, see SWMP's technical bulletin entitled *Guidance For Preparing Solid Waste Disposal Area Closure and Post-Closure Plans* or contact SWMP at (573) 751-5401.

1. Closure Schedule

A. Notify the SWMP in writing of intentions to cease taking waste 180 days prior to anticipated closing date.

B. Implementation of closure must begin within 30 days of last receipt of waste.

C. Closure must be completed within 180 days of the initiation of closure activities. Time extensions may be granted by SWMP. To request an extension the owner or operator must submit a written request to SWMP within at least 30 days of the closure deadline and include a proposed schedule for completing closure. Extensions will only be granted on a case-by-case basis. However, the owner or operator must have made considerable efforts in previously closing the landfill.

2. Final Closure Guidance

As each phase of the landfill is completed, final cover must be applied. A good final cover will help minimize surface water infiltration and subsequent leachate production as well as minimize gas migration produced by decomposing waste. Following are descriptions of the various components of a final cover.

A. Landfills Without Composite Liners
   1. Two feet of compacted soil classified as CH, CL, ML, SC or MH as per ASTM method D-2487.
   2. One foot of vegetative soil.

B. Landfills With Composite Liners
   1. One foot of compacted soil classified as CH, CL, ML, SC or MH as per ASTM method D-2487.
   2. Geomembrane, equal to that of liner, at least 30 mil thick or 60 mil for HDPE liners.
   3. Lateral drainage layer must be constructed between the vegetative soil and the underlying geomembrane.
   4. Two feet of vegetative soil.

PUB000187

Note: All borrow area soil used for cover construction must be tested by a professional engineer or their agent to ensure the soil meets the approved standards as per 10 CSR 80-3.010.

3. Construction and Grading

When constructing the final cover a strict Quality Assurance/ Quality Control (QA/QC) plan must be followed to ensure the cover is not damaged in any way.

A. Final contours of the closed landfill shall not exceed the originally approved permitted final contours unless approval is granted by the department.
B. The compacted soil layer shall be constructed in 6 inch to 8 inch lifts until the desired thickness is achieved. The compacted soil must be covered so as to prevent damage from drying and cracking.
C. Side slopes shall not exceed permitted grade or 3:1 (horizontal: vertical), whichever is less. Those areas that require the placement of a geomembrane as a component of final cover must not be allowed to erode or cause slope failure. It is recommended in these cases that the slope be decreased.
D. Terracing and letdown structures shall be constructed to prevent erosion and to control stormwater, as called for in a department approved closure plan.

4. Vegetation

Once the cover has been applied, the top surface of the landfill must be vegetated. This is important for several reasons. A good healthy stand of vegetation helps control erosion of the topsoil from surface water runoff and wind as well as helps minimize the infiltration of stormwater into the landfill and subsequent leachate production. Following are some guidelines for establishing a good stand of vegetation.

A. Methods to establish vegetation:

1. The department recommends a hardy grass or legume mixture be used such as fescue (75 pounds/acre) and clover.
2. Soil testing of the vegetative layer for proper application of lime, fertilizer and other soil conditioning.
3. The application of mulch must be utilized during the time vegetation is to be established. Mulch is used to help prevent slope erosion, conserve soil moisture, prevent seed from being washed or blown away as well as prevent weed growth. Acceptable mulching materials include, but are not limited to, straw, hay or fiber. However, sawdust or chipped wood is not a suitable material for use as mulch.

B. The department considers that a good stand of healthy vegetation is one that controls and prevents erosion and provides vegetative cover of at least 80 percent of any square foot evaluated by department personnel. The department reserves the right to determine whether or not vegetation has been adequately established before closure is approved.

5. Submittals for Closure Approval

Before closure can be approved, three copies of the following documentation must be submitted.

A. Certification by a professional engineer registered in Missouri that closure has been completed in accordance with an approved closure plan. The certification must include

1. As-built drawings of the landfill. These drawings must include final contours of the landfill, vertical and horizontal limits of waste placement and any environmental control systems at the landfill. (The survey plat referenced below may be included on the as-built drawings, eliminating the need for two separate drawings.)
2. Evidence that final cover components have been verified for depth and types of cover soils on 100 foot centers and identified on the as-built drawings.
3. Evidence that a dense stand of hardy vegetation has been established as per SWMP requirements, section 4. B. of this document.

B. A survey plat prepared by a licensed surveyor registered in Missouri must be submitted upon completion of closure. The plat must contain the following information at a minimum:

1. The name of the property owner as it appears on the property deed.
2. A survey and detailed legal description of the waste limits, the permitted area and the property boundary.
3. The general types, locations and depths of wastes within the property.
4. The location of any environmental control systems in place at the landfill and the length of time these systems and the landfill are to be maintained.
5. The location of all boundary markers and benchmarks located at the site.

Note: Filing of Survey Plat:

1. Within 30 days of department approval of the plat, the owner or operator shall file the plat with the county recorder of deeds.
2. Two copies of the recorded plat shall be submitted to the department within 30 days of the filing.

C. Owners or operators of solid waste disposal areas permitted prior to Jan. 1, 1987 and which close after Jan. 1, 1989 as part of closure must

1. Execute an easement with the department or its agents to enter the site to monitor, maintain, or take remedial action during the 30 year post-closure period.
2. Submit evidence to the department that a notice and covenant running with land has been filed with the county recorder of deeds. The notice and covenant shall specify the following:

    A. The property has been permitted as a sanitary landfill.
    B. That use of the land which interferes with the closure/post-closure plan is prohibited.

SWMP has created a standard form entitled *Agreement for Easement, Notice and Covenant Running With Land*, which must be submitted upon completion of closure. This form should be completed concurrently with the survey plat.

6. Closure Approval/Denial

Upon completion of the above closure activities, the permittee must request from the SWMP approval for final closure of the landfill and that closure funds be released.

A. SWMP will conduct a final closure inspection to verify that all the requirements for closure have been met.

B. SWMP will either approve or deny the request for closure approval. If the request is approved, closure funds will be released. If the request is denied, a letter will be sent to the permittee outlining the deficiencies for closure and time frames for compliance.

7. Recommended Guidance

A. Missouri Department of Natural Resources technical bulletin *Guidance For Preparing Solid Waste Disposal Area Closure and Post-Closure Plans.*

B. U.S. Environmental Protection Agency report *Standard Procedures For Planting Vegeta tion On Completed Sanitary Landfills.*

C. University of Missouri Extension Services document *How to Get A Good Soil Sample.*

D. University of Missouri Extension Services document *Using Your Soil Test Results.*

For more information call or write:

Missouri Department of Natural Resources
Solid Waste Management Program
P.O. Box 176
Jefferson City, MO 65102-0176
1-800-361-4827 or (573) 751-5401 office
(573) 526-3902 fax
www.dnr.mo.gov/env/swmp Program Home Page

Appendix 2

MDNR "Preparing Solid Waste Disposal Area Closure and Post-Closure Plans" Technical Bulletin, dated 6/2006

Missouri Department of Natural Resources

Preparing Solid Waste Disposal Area Closure and Post-Closure Plans

Solid Waste Management Program Technical bulletin 6/2006

Introduction

The Missouri Department of Natural Resource's Solid Waste Management Program has developed this technical bulletin to help landfill owners prepare closure and post-closure plans. Closure and post-closure plans are intended to describe how a facility will be closed and maintained, and more importantly to provide a basis for calculating the amount of financial assurance required for the facility. Closure and post-closure plans must be prepared or approved by a Professional Engineer (P.E.) registered in the State of Missouri, and must be approved by the Solid Waste Management Program.

The Missouri Solid Waste Management Regulations contain the following requirements in regard to closure and post-closure plans:

- Owners of active sanitary landfills are required to provide closure plans and thirty-year post-closure plans.
- Owners of active demolition landfills, utility waste landfills and special waste landfills are required to provide closure plans.
- Owners of demolition landfills permitted after July 30, 1997, are also required to provide thirty-year post-closure plans.
- Owners of utility and special waste landfills permitted after July 30, 1997, are required to provide twenty-year post-closure plans.
- Owners of inactive landfills are required to provide closure and post-closure plans in accordance with the regulations in place at the time the facility ceased accepting waste.

This technical bulletin addresses two aspects of closure and post-closure plans: the text of the plan itself and the closure and post-closure cost estimates. These aspects apply to the following facilities:

Text of the plan

- Applies to facilities permitted after the date of this technical bulletin.
- Currently active facilities and permitted facilities that are not yet constructed will only be required to revise the text of their closure and post-closure plans to follow this new format when updating their closure and post-closure plans for any reason.
- Does not apply to inactive facilities (those that have ceased accepting waste).

Cost estimates

- Applies to facilities permitted after the date of this technical bulletin.
- Currently active facilities, and facilities that are permitted but not yet constructed will be required to revise their cost estimates with the next annual financial assurance update.
- Does not apply to inactive facilities.

PUB000195

The Solid Waste Management Program recommends that the closure and post-closure plans be a separate document rather than a section, or appendix, of the overall engineering report for the facility. It is important to make a distinction between the closure and post-closure plans and other aspects of the engineering design. The regulatory requirements are specific for final cover systems, gas control systems, surface water control systems, and environmental monitoring systems. The detailed aspects of design should be addressed in the appropriate section of the engineering report. The closure and post-closure plans address more general requirements.

Where possible, the closure and post-closure plans should refer to the approved design and the approved monitoring plans, but should not reiterate them in detail. Nor should changes to the closure and post-closure plans be submitted to modify the design of the final cover system, the surface water control system, the gas collection system, the gas-monitoring plan, or the groundwater monitoring plan. The closure and post-closure plan should focus on implementation of the design, the monitoring plans, and the maintenance activities.

Not only will eliminating redundancy decrease the chances for contradictions between the engineering design documents and the closure and post-closure plans, but in many cases it will allow the owner to modify some aspect of the design, or perhaps a monitoring plan, without having to make changes to the closure or post-closure plans.

This technical bulletin has been written to address the most detailed aspects of closure and post-closure. Many of the design features discussed here, such as geosynthetic caps and active gas collection systems, may not apply to demolition landfills, utility waste landfills, special waste landfills, or older areas of sanitary landfills. Only those portions applicable to the design and operation of your facility must be addressed.

Closure Plan

According to the regulations, closure plans must include a description of the methods and time schedules for closure of the permitted area. The plans may have distinctly different contents for older facilities as opposed to newer ones.

Methods

The engineering design should already address in detail the construction methods to be used for the final cap system and other systems that will be built during closure, such as the gas control system and the surface water control system. There is no need to repeat these construction methods in detail in the closure plan. However, the quality assurance/quality control (QA/QC) methods for these systems may not be clearly specified in the approved engineering design. QA/QC is an important part of closure since it forms the basis for the engineering certification that the facility was properly closed. It includes things such as laboratory and field testing of soils and membranes as well as survey control. It is essential to address this aspect of construction in one way or another. While more modern facilities usually have separate QA/QC plans, older facilities may not. If not, this aspect of closure must be addressed in the closure plan.

Schedule

Since the closure schedule depends on unpredictable factors, particularly waste flow, it would be futile to present a detailed closure schedule in the closure plan. This aspect of closure would more appropriately be termed a closure sequence. Again, for older facilities as opposed to newer ones, the closure plan may have a different focus in this regard.

Newer facilities are typically designed in phases. Current regulations require landfill owners to submit phase development drawings to show how the site will be developed. These drawings should be detailed enough to show the various stages of development of the landfill, from liner

construction in new phases through closure of older phases, including construction of gas and surface water control systems. In other words, the closure sequence should already be laid out in sufficient detail in these phase development drawings. However, for older facilities, phase development drawings more than likely do not exist and should be included in the closure post-closure plan.

The closure plan must address the following:

- The plan must indicate the closure status of all areas within the permitted boundary that have received waste, regardless of when they were filled.
- The plan must indicate whether the facility will close in phases or all at one time.
- The plan must indicate the total size of the entire landfill footprint.
- For phased closure, the plan must also indicate the size of each phase.
- The plan must indicate that Missouri Department of Natural Resources will be notified in writing at least 180 days before the anticipated last receipt of waste in the landfill; or, for phased development, in any particular phase.
- The plan must indicate that closure will begin within 30 days of the last receipt of waste in the landfill or phase and will be completed within 180 days of beginning closure. The regulations allow the department to grant extensions to these time frames in certain situations, but any proposed deviations must be clearly indicated in the closure plan.
- The plan must indicate all the major steps necessary to close the landfill based on the approved engineering design and the conditions of the permit.
- For phased facilities with approved phase development drawings, the closure sequence should be summarized in the closure plan in enough detail to allow the department to determine when various landfill components will be constructed.
- For phased facilities without approved phase development drawings, the closure plan should include drawings clearly showing the planned closure sequence for the facility. The drawings should be correlated with the text of the plan to clearly indicate when various landfill components will be constructed.
- If you have an approved QA/QC plan for your facility that addresses the current regulatory requirements and construction verification procedures for the final cover system and other components to be installed or constructed as a part of closure, a simple reference to the QA/QC plan in the closure plan is sufficient.
- If you do not have an approved QA/QC plan, the closure plan must include a QA/QC plan for the final cover system and any component that will be installed as a part of closure. The QA/QC plan must address all field and laboratory procedures that will be used to verify the material properties and the construction methods for each component. The QA/QC plan must also address survey control.
- The plan must indicate that, upon completion of closure activities, a P.E. registered in the state of Missouri will certify that the facility or phase was properly closed.

Post-closure plans

According to the regulations, post-closure plans must address the maintenance and monitoring activities required during the post-closure period. However, most of the monitoring activities are performed in accordance with approved surface water, groundwater, and gas monitoring plans. There is no need to reiterate these monitoring plans in great detail in the post-closure plan. A simple reference is adequate. The plan should focus mostly on maintenance activities.

The post-closure plan must address the following:

- The plan must show that groundwater monitoring and gas monitoring will be done in accordance with the approved monitoring plans and the terms and conditions of the permit.
- The plan must show that surface water monitoring, if applicable, will be conducted in accordance with the terms and conditions of any permit(s) issued by the Missouri Clean Water Commission.
- The plan must show the activities necessary to maintain the integrity of the final cover system, the leachate collection system, the gas control system, the gas monitoring system, the surface water control system, the groundwater monitoring system, and any other system specified in the approved engineering design.
- The plan must show the location where landfill records will be kept during the post-closure period. A copy of these records must be made available to the appropriate department staff upon request.

Financial assurance and cost estimates

Current regulations require owners of sanitary, demolition, and utility waste landfills to provide a closure Financial Assurance Instrument (FAI). Sanitary landfill owners are also required to provide a post-closure FAI. FAIs are necessary to ensure that the department has sufficient funds to properly close and maintain the facility in the event the owner is unable to do so. The closure FAI may be returned if final closure has been approved in writing by the department. A portion of the post-closure FAI may be returned annually starting on the sixth anniversary of the beginning of the post-closure period, and the remainder may be refunded after completion of the post-closure period.

New facilities

The solid waste disposal area permitting process is separated into several distinct steps. In addition to the preliminary and detailed site investigation requirements, owners of new facilities, those applying for a construction permit after July 30, 1997, are now required to obtain a construction permit to build a landfill and an operating permit to begin receiving waste. For owners of new facilities, a closure FAI is due prior to obtaining the initial construction permit, and a post-closure FAI is due prior to obtaining the initial operating permit.

If the operations are phased, the initial closure FAI only needs to include the amount necessary to close the first phase of the landfill, while the initial post-closure FAI must include the separable post-closure costs for the first phase, plus the inseparable post-closure costs for the entire landfill. Separable costs are those which are common only to a particular phase, such as cover maintenance. Inseparable costs are those which are common to the entire landfill, such as annual inspections, gas monitoring, and groundwater monitoring. These inseparable activities will be required for the entire landfill for the duration of the post-closure period whether or not subsequent phases are developed. For subsequent phases of new facilities, both the closure FAI and separable post-closure FAIs are due when operation of the phase is requested.

Existing facilities

Owners of existing facilities must have a closure and post-closure FAI in place for any area of the landfill in which waste was placed after Jan. 1, 1987. For newly developed phases of existing facilities, as with new facilities, both the closure FAI and separable post-closure FAIs are due when operation of the phase is requested.

Worksheet

In order to determine the amount of funding required for financial assurance, it is necessary to do a cost estimate. The purpose of the closure cost estimate is to determine the funding required for the department to complete landfill closure. The purpose of the post-closure cost estimate is

to determine the funding required for the department to maintain and monitor the facility for the duration of the post-closure period.

To simplify the cost estimation process, the department has developed the attached worksheet to be used in calculating the amount of financial assurance required for closure and post-closure. To understand the need for a simplified worksheet, you must first understand the scenario under which the department will be required to perform closure and post-closure activities. In this situation, there will either be no responsible party, or the responsible party will be unwilling or unable to perform closure or post-closure activities. There is no other reason for the department to assume these responsibilities. In this scenario, it is quite likely that the facility has been poorly managed, either operationally, financially, or both.

In a premature closure scenario, it is unlikely that the landfill will resemble what was depicted in the approved final contour drawings. Some areas of the landfill may be at the permitted final elevation while others may be significantly lower, or higher if the landfill was poorly managed. It is likely that extensive regrading will be required for cover construction; surface water may have to be routed differently than indicated in the approved design and some portions of the gas system may be installed while others are not. The department will likely hire a consultant to determine the most cost-effective method of closure. No one can anticipate all possible scenarios, nor is the FAI intended to provide funds for all possible scenarios. It is also difficult to accurately estimate the costs for complicated systems such as landfill gas collection systems even under ideal circumstances, much less during a premature closure scenario.

For this reason, the cost estimates are not intended to be extremely detailed or complicated. They are intended as a simple method of providing a reasonable amount of money to allow the department to evaluate the condition of the landfill and close it in accordance with the minimum requirements of the regulations and any special requirements imposed by the design engineer. The most important thing is that estimates be reasonably accurate and include costs for all major aspects of landfill closure and post-closure.

The attached worksheet must be completed in order to determine the closure and post-closure costs. Any critical feature(s) included in the design for which there is no line item on the worksheet must be accounted for as well. For these features, the department will allow the use of third party quotes or professional judgement on the part of the design engineer in preparing cost estimates. These estimates should be attached to the worksheet.

Please note that this worksheet only applies to facilities with Subtitle D (composite) caps or standard soil caps (two feet of compacted clay overlain with one foot of vegetative soil). Some demolition landfills, utility waste landfills, and special waste landfills are designed with other types of caps. The department will work with the owners of these facilities on a case by case basis to determine the amount of financial assurance required, using the principles and unit costs developed in this technical bulletin.

Due to variations in design, more than one worksheet may be necessary for your facility. For example, some older landfills have both Subtitle D areas and areas with soil caps. Some portions of the landfill may be required to have an active gas extraction system while others are not. In some cases, for example where a Subtitle D permit has superceded a previous permit, one worksheet can be completed to account for all areas within a permitted landfill. However, we suggest that you complete a separate worksheet for each distinct area. The worksheet is simple enough that this should not be difficult. In no case should areas with different permit numbers be combined on the same worksheet. The text of the plan should address each distinct area and explain the variations in design from one area to the next.

For a facility where all areas or phases are designed the same, such as a complete Subtitle D facility, as subsequent phases are opened you should submit a new worksheet that accounts for all phases of the landfill. For example, if you are submitting a request to open the fifth of ten phases, you should replace previously submitted worksheets with a new one that accounts for the total acreage for phases one through five.

The worksheet is based on unit closure costs for the following standardized aspects of design:

- Compacted clay cap
- Gas collection or venting system
- 40 mil low density polyethylene membrane
- Geocomposite drainage net, if applicable
- Vegetative soil
- Surface water controls
- Vegetation
- Borrow area reclamation
- Professional services

Owners of Subtitle D facilities must provide an FAI for either an active gas extraction system or a passive venting system. You must provide an FAI for an active system only if you are:

1. required to install the system by the department to control off-site gas migration,
2. required to install the system under the Federal New Source Performance Standards (NSPS), or,
3. required to install the system by some other regulatory agency.

If you own a Subtitle D facility and do not meet any of these conditions, you are only required to provide an FAI for a passive venting system. Owners of non-Subtitle D facilities (with soil caps) are not required to provide an FAI for a gas control system at all unless they meet at least one of the above conditions.

For simplicity, the worksheet costs are the same for active extraction wells and passive vents. Costs for wells or vents must be included in the cost estimate for the phase in which they will be physically located. However, costs for other components such as connecting piping, blowers, and flares, if required, only need to be included in the cost estimate at the point they are determined to be necessary by the design engineer. Again, this will depend entirely on the phase development and closure sequence discussed previously.

For example, assume that your landfill is large enough that you will eventually be required to install a gas extraction system under NSPS. The design engineer determines that the emissions will exceed the threshold limit when the fifth of ten phases are in place. In other words, if the landfill closes prematurely after only four phases are in place, the facility will be below the threshold limit and only a passive venting system will be required. The costs for the gas vents for each of the first four phases must be included in the FAI cost estimates for those phases because they will be required regardless of whether the fifth phase is ever constructed. You must at least vent Subtitle D landfills. You must use Form B, the Worksheet for Passive Gas System, through the first four phases. However, when you request to operate the fifth phase, since this will cause you to reach the threshold limit, you must now convert the passive vents to active extraction wells, install connecting piping, and the blower/flare station. To calculate your closure cost for this system, you must complete Form A, the Worksheet for Active Gas Systems.

The worksheet is based on unit post-closure costs for the following standardized maintenance and monitoring activities:

- Site inspections
- Erosion repair and revegetation of final cap
- Groundwater sampling and analysis
- Gas monitoring
- Leachate disposal
- Groundwater monitoring system maintenance and repair
- Gas monitoring system maintenance and repair
- Gas control system maintenance and repair (if applicable)
- Leachate management system maintenance and repair
- Professional services

Owners of facilities that voluntarily design and install an active gas system will be required to provide post-closure maintenance costs for the system once it is constructed. This is simply because, once the system has been built, the department will have to maintain it.

Worksheet unit costs

In the event the department is required to close a landfill, labor rates for the project will be in accordance with the prevailing wage rates in the county in which the landfill is located. Therefore, the unit costs in the worksheet are based primarily on R.S. Means publications because they reflect average national wage rates. A detailed analysis of the unit costs is available upon request.

You will note that the costs vary significantly depending on the round trip haul distance from the borrow area, and whether or not the landfill owner has granted an easement to the department for use of the borrow soils for closure. The higher costs due to increased haul distance should be apparent. Costs are also tied to the easement because, if the department is required to complete closure of a landfill or perform cover maintenance during the post-closure period, the costs will be much higher if we have to purchase the soil from an outside source. Therefore, unless you have executed an easement with the department that allows the use of borrow soil for closure and post-closure, we must make an assumption as to the availability of borrow soil. This assumption is that we will be able to locate and purchase the required quantity of suitable soils within five miles of the site. Therefore, for the purposes of cost estimating, we will assume a round trip haul distance of 10 miles.

Updating the cost estimate and FAI

One of the advantages of the simplified worksheet is that it minimizes the changes required to the cost estimate and the FAI. In order to understand this, you must understand the distinction between changes to the cost estimate and changes to the FAI.

The cost estimate is based on the major aspects of landfill design such as total acreage permitted for waste disposal (landfill footprint), the type of cover (subtitle D or non-subtitle D), the type of gas system (active or passive), and the number of groundwater monitoring wells. Once your cost estimate has been revised to match the figures in this technical bulletin, it must be updated only if some design aspect changes.

The FAI is a document ensuring that a reasonable amount of money is guaranteed to the department to complete closure and post-closure activities. It is based on the cost estimate. The amount of money must be updated annually for inflation, or if the cost estimate changes.

To illustrate this, we will use the following example:

Assume that, once your cost estimate is revised to match the figures in the technical bulletin, your closure cost estimate is $2 million and your post-closure cost estimate is $3 million. If you operate for twenty years and never modify any aspect of design, you will never need to change that cost estimate. You only need to increase the FAI annually for inflation, as outlined below. However, assume that at some point you are required by the department to install an active gas system to control a gas migration, or add two groundwater-monitoring wells. You must submit a new worksheet accounting for the increased closure or post-closure cost for the modification. Once the modifications and new cost estimate are approved by the Solid Waste Management Program, you will be required at that time to update your FAI to match the new cost estimate. From that point on, the FAI must be increased annually for inflation, but no changes to the cost estimate will be necessary unless further design changes are approved.

It is important to note that using the worksheet to update a cost estimate will always result in an estimate in year 2000 dollars. This figure must then be updated for inflation to the current year.

Annual adjustments for inflation

Annual adjustments for inflation are determined by increasing the original dollar value using a multiplier. The multiplier is the latest percent change in the Implicit Price Deflator (IPD) for the Gross Domestic Product as determined by the U.S. Department of Commerce. The IPDs change every quarter depending on the current rate of inflation. You must always use the most recent IPD when updating a cost estimate or FAI. The most recent IPD can be obtained from the Solid Waste Management Program.

Forms Available Online

Closure and Post-Closure Cost Worksheet

www.dnr.mo.gov/forms/780-1882.pdf

Form A - Active Gas System Worksheet

www.dnr.mo.gov/forms/780-1881.pdf

Form B - Passive Gas System Worksheet

www.dnr.mo.gov/forms/780-1880.pdf

Table 1 - Cover Systems Construction and Repair Costs

www.dnr.mo.gov/forms/780-1879.pdf

For more information call or write:

Missouri Department of Natural Resources
Solid Waste Management Program
P.O. Box 176
Jefferson City, MO 65102-0176
1-800-361-4827 or (573) 751-5401 office
(573) 526-3902 fax
www.dnr.mo.gov/env/swmp Program Home Page

Appendix 3

Agreement for Easement, Notice and Covenant Running with Land – Franklin County

Missouri Department of Natural Resources
Solid Waste Management Program

AGREEMENT FOR EASEMENT,
NOTICE AND COVENANT RUNNING WITH LAND
(Standard Form 4-11-96)

This Agreement made this DRAFT day of _____, 20___, between the Missouri Department of Natural Resources, hereinafter called Department and Ameren Missouri, hereinafter called Owner, to satisfy the requirements of the Missouri Solid Waste Management Law.

WITNESSETH.

Owner wishes to execute an Agreement for Easement, Notice and Covenant Running with Land for a solid waste disposal area (hereinafter called landfill) on property owned by owner in Franklin County, Missouri, and more fully described as follows:

PART OF SECTIONS 8 AND 17 AND PART OF U.S. SURVEY 98 IN TOWNSHIP 44 NORTH, RANGE 2 EAST OF THE FIFTH PRINCIPAL MERIDIAN, FRANKLIN COUNTY, MISSOURI, DESCRIBED AS FOLLOWS:

BEGINNING AT THE SOUTHWEST CORNER OF LOT 1 OF "WORTHINGTON HEIRS SUBDIVISION" AS RECORDED IN PLAT BOOK C, PAGE 25 IN THE FRANKLIN COUNTY RECORDS, SAID SOUTHWEST CORNER BEING ON THE NORTHERLY RIGHT OF WAY LINE OF THE CHICAGO (100' W) ROCK ISLAND AND PACIFIC RAILWAY COMPANY; THENCE DEPARTING SAID NORTHERLY LINE AND ALONG THE WESTERLY LINE OF SAID "WORTHINGTON HEIRS SUBDIVISION" NORTH 01 DEGREES 28 MINUTES 18 SECONDS EAST, 80.58 FEET TO THE POINT OF BEGINNING OF THE TRACT HEREIN DESCRIBED; THENCE DEPARTING SAID WESTERLY LINE SOUTH 71 DEGREES 57 MINUTES 43 SECONDS WEST, 53.86 FEET; THENCE SOUTH 61 DEGREES 52 MINUTES 36 SECONDS WEST, 208.05 FEET; THENCE SOUTH 60 DEGREES 39 MINUTES 30 SECONDS WEST, 331.03 FEET; THENCE SOUTH 69 DEGREES 57 MINUTES 40 SECONDS WEST, 377.65 FEET; THENCE SOUTH 77 DEGREES 17 MINUTES 21 SECONDS WEST, 250.40 FEET; THENCE NORTH 86 DEGREES 14 MINUTES 27 SECONDS WEST, 273.79 FEET; THENCE 89 DEGREES 40 MINUTES 33 SECONDS WEST, 235.30 FEET; THENCE NORTH 83 DEGREES 46 MINUTES 07 SECONDS WEST, 191.63 FEET; THENCE NORTH 87 DEGREES 02 MINUTES 14 SECONDS WEST, 216.88 FEET; THENCE SOUTH 84 DEGREES 28 MINUTES 52 SECONDS WEST, 166.48 FEET; THENCE SOUTH 71 DEGREES 37 MINUTES 58 SECONDS WEST, 120.83 FEET; THENCE SOUTH 71 DEGREES 28 MINUTES 48 SECONDS WEST, 164.93 FEET; THENCE SOUTH 55 DEGREES 47 MINUTES 10 SECONDS WEST, 343.76 FEET; THENCE SOUTH 55 DEGREES 28 MINUTES 54 SECONDS WEST, 805.68 FEET; THENCE NORTH 01 DEGREES 23 MINUTES 57 SECONDS EAST, 7597.67 FEET; THENCE SOUTH 86 DEGREES 27 MINUTES 31 SECONDS EAST, 5469.88 FEET; THENCE SOUTH 02 DEGREES 02 MINUTES 11 SECONDS WEST, 2991.70 FEET; THENCE SOUTH 01 DEGREES 17 MINUTES 10 SECONDS WEST, 1070.22 FEET; THENCE SOUTH 01 DEGREES 09 MINUTES 17 SECONDS WEST, 1239.51 FEET; THENCE SOUTH 01 DEGREES 42 MINUTES 10 SECONDS WEST, 492.33 FEET; THENCE SOUTH 81

DEGREES 39 MINUTES 02 SECONDS WEST, 663.60 FEET; THENCE SOUTH 83 DEGREES 24 MINUTES 58 SECONDS WEST, 688.43 FEET; THENCE SOUTH 84 DEGREES 50 MINUTES 23 SECONDS WEST, 306.70 FEET; THENCE SOUTH 80 DEGREES 32 MINUTES 21 SECONDS WEST, 241.96 FEET; THENCE SOUTH 71 DEGREES 57 MINUTES 43 SECONDS WEST, 176.34 FEET TO THE POINT OF BEGINNING.

SAID TRACT BEING SITUATED IN FRANKLIN COUNTY, MISSOURI AND CONTAINING 35,422,418 SQUARE FEET OR 813.187 ACRES, MORE OR LESS.

Owner has access to the above described landfill as follows:

PART OF SECTIONS 8 AND 17 AND PART OF U.S. SURVEY 98 IN TOWNSHIP 44 NORTH, RANGE 2 EAST OF THE FIFTH PRINCIPAL MERIDIAN, FRANKLIN COUNTY, MISSOURI, DESCRIBED AS FOLLOWS:

BEGINNING AT THE SOUTHWEST CORNER OF LOT 1 OF "WORTHINGTON HEIRS SUBDIVISION" AS RECORDED IN PLAT BOOK C, PAGE 25 IN THE FRANKLIN COUNTY RECORDS, SAID SOUTHWEST CORNER BEING ON THE NORTHERLY RIGHT OF WAY LINE OF THE CHICAGO (100' W) ROCK ISLAND AND PACIFIC RAILWAY COMPANY; THENCE DEPARTING SAID NORTHERLY LINE AND ALONG THE WESTERLY LINE OF SAID "WORTHINGTON HEIRS SUBDIVISION" NORTH 01 DEGREES 28 MINUTES 18 SECONDS EAST, 80.58 FEET TO THE POINT OF BEGINNING OF THE TRACT HEREIN DESCRIBED; THENCE DEPARTING SAID WESTERLY LINE SOUTH 71 DEGREES 57 MINUTES 43 SECONDS WEST, 53.86 FEET; THENCE SOUTH 61 DEGREES 52 MINUTES 36 SECONDS WEST, 208.05 FEET; THENCE SOUTH 60 DEGREES 39 MINUTES 30 SECONDS WEST, 331.03 FEET; THENCE SOUTH 69 DEGREES 57 MINUTES 40 SECONDS WEST, 377.65 FEET; THENCE SOUTH 77 DEGREES 17 MINUTES 21 SECONDS WEST, 250.40 FEET; THENCE NORTH 86 DEGREES 14 MINUTES 27 SECONDS WEST, 273.79 FEET; THENCE 89 DEGREES 40 MINUTES 33 SECONDS WEST, 235.30 FEET; THENCE NORTH 83 DEGREES 46 MINUTES 07 SECONDS WEST, 191.63 FEET; THENCE NORTH 87 DEGREES 02 MINUTES 14 SECONDS WEST, 216.88 FEET; THENCE SOUTH 84 DEGREES 28 MINUTES 52 SECONDS WEST, 166.48 FEET; THENCE SOUTH 71 DEGREES 37 MINUTES 58 SECONDS WEST, 120.83 FEET; THENCE SOUTH 71 DEGREES 28 MINUTES 48 SECONDS WEST, 164.93 FEET; THENCE SOUTH 55 DEGREES 47 MINUTES 10 SECONDS WEST, 343.76 FEET; THENCE SOUTH 55 DEGREES 28 MINUTES 54 SECONDS WEST, 805.68 FEET; THENCE NORTH 01 DEGREES 23 MINUTES 57 SECONDS EAST, 7597.67 FEET; THENCE SOUTH 86 DEGREES 27 MINUTES 31 SECONDS EAST, 5469.88 FEET; THENCE SOUTH 02 DEGREES 02 MINUTES 11 SECONDS WEST, 2991.70 FEET; THENCE SOUTH 01 DEGREES 17 MINUTES 10 SECONDS WEST, 1070.22 FEET; THENCE SOUTH 01 DEGREES 09 MINUTES 17 SECONDS WEST, 1239.51 FEET; THENCE SOUTH 01 DEGREES 42 MINUTES 10 SECONDS WEST, 492.33 FEET; THENCE SOUTH 81 DEGREES 39 MINUTES 02 SECONDS WEST, 663.60 FEET; THENCE SOUTH 83 DEGREES 24 MINUTES 58 SECONDS WEST, 688.43 FEET; THENCE SOUTH 84 DEGREES 50 MINUTES 23 SECONDS WEST, 306.70 FEET; THENCE SOUTH 80 DEGREES 32 MINUTES 21 SECONDS WEST, 241.96 FEET; THENCE SOUTH 71 DEGREES 57 MINUTES 43 SECONDS WEST, 176.34 FEET TO THE POINT OF BEGINNING.

SAID TRACT BEING SITUATED IN FRANKLIN COUNTY, MISSOURI AND CONTAINING 35,422,418 SQUARE FEET OR 813.187 ACRES, MORE OR LESS.

NOW, THEREFORE, in consideration of the mutual covenants of the parties and other valuable consideration, receipt of which is hereby acknowledged, the Department and Owner agree as follows:

1. The Department has issued Solid Waste Disposal Area Operating Permit No. ___ to Ameren Missouri, dated _____, 20___, for the operation of a landfill by Owner in compliance with the provisions pursuant to the Missouri Solid Waste Management Law.

2. The owner hereby grants, bargains, sells and conveys to the Department, its agents, contractors, successors and assigns an easement in the landfill described above, together with an easement in the access property owned by landowner as described above, to enter the landfill as necessary to complete work specified in the closure plan, or to monitor or maintain the site if specified in a post-closure plan, or to take remedial action during the post-closure period. "Closure plan", "post-closure plan", and "post-closure period" are defined pursuant to the Missouri Solid Waste Management Law and for the purpose of this agreement are described in permit number _____DRAFT_____. If the landfill is accessible only through property not owned by landowner, the owner/operator should obtain a separate easement from the access property's owner(s) in favor of the Department for appropriate access. The Department will provide assistance if this is necessary.

3. This agreement, when filed by the Owner with the Recorder of Deeds for Franklin County, Missouri, shall serve as notice that the property described herein has been permitted as a solid waste disposal area and, that use of the property in any manner which interferes with the closure and, where appropriate, post-closure plans filed with the Department is prohibited.

4. The owner, heirs, successors in title, personal representatives and assigns shall not use the herein described property in any manner which interferes with any closure and/or post-closure plans which are filed with the Department. Further, the use of the herein described property is subject to the Missouri Solid Waste Management Law and the rules promulgated thereunder.

5. Any restriction in this agreement on the use of the herein described property is a covenant running with the land.

IN WITNESS WHEREOF, the parties have hereunto set their hands the day and year first above written.

OWNER:	DEPARTMENT:
_____	_____
Ameren Missouri	Missouri Department of Natural Resources
Name: _____	Name: DRAFT
Title: _____	Title: Director

Notary for Owner:

STATE OF MISSOURI)
) ss
COUNTY OF)

On this _____ day of _____, 20___, before me personally appeared (name), to me know to be the person described in and who executed the foregoing instrument, and acknowledged that they executed the same as their free act and deed.

IN WITNESS WHEREOF, I have hereunto set my hand and affixed my official seal in the County and State aforesaid, the day and year first above written.

DRAFT
Notary Public

Commission in _____ County.

My Commission Expires: _____.

Notary for Missouri Department of Natural Resources

STATE OF MISSOURI)
) ss
COUNTY OF COLE)

On this _____ day of _____ in the year 20___ before me, DRAFT
, a Notary Public in and for the said state, personally appeared _____DRAFT_____, _____, Missouri Department of Natural Resources, known to me to be the person who executed the within document in behalf of the Department and acknowledged to me that he executed the same for the purposes therein stated.

DRAFT
Notary Public

Commissioned in _____ County.

My Commission Expires: _____.

Appendix 4

Closure and Post-Closure Cost Worksheets

Appendix 4A

Closure and Post-Closure Cost Worksheet
Total, All Four (4) Phases: 166.5 Acres

MISSOURI DEPARTMENT OF NATURAL RESOURCES
SOLID WASTE MANAGEMENT PROGRAM

CLOSURE AND POST-CLOSURE COST WORKSHEET

TOTAL ACREAGE-ALL PHASES

THIS WORKSHEET IS ONLY REQUIRED FOR THOSE FACILITIES THAT ACCEPT WASTE AFTER JAN. 1, 2004. OTHERS MAY USE THE WORKSHEET IF THEY CHOOSE.

DATE	NAME OF FACILITY	PERMIT NUMBER
1/10/13	Ameren Missouri Labadie Utility Waste Landfill	

TOTAL PERMITTED ACREAGE (INCLUDING UNDEVELOPED AREAS)		TOTAL ACREAGE WITH WASTE IN PLACE (INCLUDING OFFICIALLY CLOSED AREAS)		TOTAL ACREAGE WITH OFFICIAL CLOSURE APPROVAL	
SUBTITLE D	NON-SUBTITLE D	SUBTITLE D	NON-SUBTITLE D	SUBTITLE D	NON-SUBTITLE D
166.5	0	0	0	0	0

1. How many acres is this financial assurance instrument intended for?

   acres for closure 166.5 acres for post-closure 0

2. Description of area (cell number, etc.)

   Ameren Missouri Labadie Utility Waste Landfill (TOTAL ACREAGE)

3. What is the approved final cover system design?

   ☒ Subtitle D: one foot of compacted clay overlain with a geomembrane, a drainage layer and two feet of vegetative soil.
   ☐ Standard soil cover: two feet of compacted clay overlain with one foot of vegetative soil.
   (If your facility has both subtitle D and non-subtitle D areas, separate worksheets are advisable for these areas to avoid confusion.)

4. Has an easement been granted to the Missouri Department of Natural Resources for access to and use of the borrow material for cap construction?

   ☒ Yes ☐ No

5. What is the average round-trip distance from the landfill (or phase) to the borrow area? Round trip distance should be to the nearest ½ mile if less than five miles. If more than five miles, round trip distance should be to the nearest mile. If the department does not have an easement to the borrow area, the round trip haul distance is assumed to be 10 miles.

   0.5 miles

6. What is the approximate volume of soil remaining in the borrow area?

   0 Clay (cubic yards)

   537,200 Vegetative soil (cubic yards)

7. What is the approved gas control system design?

   ☐ Active extraction system ☐ Passive venting system ☒ No gas control system

   If you have an active extraction system, check the appropriate box.
   ☐a. Required to control gas migration
   ☐b. Required under NSPS
   ☐c. Required by other agency (city, county, etc.)
   ☐d. Specified only by design engineer

   If you check box "d", is any part of the active gas system constructed at this time?
   ☐Yes ☐No If yes, provide a general description of the portion(s) of the system installed.

Note: Owners of Subtitle D facilities must provide a closure financial assurance instrument for either an active extraction system or a passive venting system. You must provide a closure FAI for an active system only when you are: 1) Required to install the system by the department to control off-site gas migration, or 2) Required to install the system under the Federal New Source Performance Standards, or NSPS, or 3) Required to install the system by another regulatory agency (city, county, etc.).
If you own a Subtitle D facility and meet any of the conditions, complete Form A. If you own a Subtitle D facility and do not meet any of these conditions, you are only required to provide a closure FAI for a passive venting system. Complete Form B if you own a non-Subtitle D facility (with a soil cap), you are not required to provide a closure FAI for a gas control system at all unless you also meet at least one of the above conditions. If you have installed any portion of an active gas control system, you must provide post-closure maintenance funds for the portion of the system constructed. Do this by checking the appropriate box on the post-closure cost worksheet and adding that amount to the total.

8. How many ground water monitoring wells do you have?
   28 wells

9. List the primary and secondary wastewater treatment plants used for leachate disposal, and the cost of disposal.
   (Primary plant) $ 0.00 per gallon (Secondary Plant) $ per gallon.
   ☐ Check if the facility discharges directly to a wastewater treatment plant.

10. What is the estimated post-closure leachate generation rate and how was it derived?
    0 (gal/acre/day) ☐ HELP model ☐ Other (please explain.)

OFFICIALLY CLOSED AREAS

11. If any areas of the landfill have been officially closed, list the following information.

Area consisting of acres received official closure , years post-closure.

Area consisting of acres received official closure , years post-closure.

Area consisting of acres received official closure , years post-closure.

Area consisting of acres received official closure , years post-closure.

Area consisting of acres received official closure , years post-closure.

TOTAL ACREAGE-ALL PHASES

CLOSURE COSTS

Final Cover System

Subtitle D (Composite cover)	166.5 acres x $ 72,910 per acre = (From Table One)		$ 12,139,515.00
Non – Subtitle D (soil cover)	acres x $ per acre = (From Table One)		$ 0.00

Gas Control System

Active extraction system (Complete Form A and write the amount in the right column.)	$	0.00
Passive gas venting system (Complete Form B and write the amount in the right column.)	$	0.00

Note: Owners are not required to provide an FAI for an **active** gas system unless required to install the system for one of the reasons listed under section 7 of this worksheet. However, owners of Subtitle D landfills are required to provide an FAI for a **passive** gas system if they do not provide one for an active system.

Other Critical Design Features

Include total cost for construction of other critical design features. Attach separate sheet(s) for cost calculations.	$	0.00
Total Closure Cost (sum of all lines) (2004 Dollars)	**$**	12,139,515.00

*** Inflation Update**
Adjust amount from 2004 dollars to present value.

Total closure cost 2004 dollars $ 12,139,515.00 x current Implicit Price Deflator * /*Please contact the Solid Waste Management Program, 573-526-5401, for the current IPD
$ 14,370,757.86

IPD 2004 4th Qtr = 97.874; IPD 2012 3rd Qtr = 115.860
(115.860 - 97.874) / 97.874 = 17.9860 / 97.874 = 0.1838
CURRENT IPD = 1.1838

TOTAL ACREAGE-ALL PHASES

POST-CLOSURE COSTS

Inseparable Annual Costs

Annual landfill inspection and reporting			$	~~4,000~~
Gas monitoring and reporting			$	~~4,450~~
Annual groundwater sampling and analysis cost.		28 wells x 2,000 =	$	56,000.00
Annual groundwater monitoring system maintenance and statistics cost.			$	13,700
☐ Leachate system maintenance (Check if applicable and write this amount in the space provided.)	$3,100		$	0.00
☐ Leachate testing (Check if applicable and write this amount in the space provided.)	$2,250		$	0.00
☐ Active gas extraction system maintenance and utilities (Check if applicable and write this amount in the space provided.)	$17,600		$	0.00
☐ Passive gas system maintenance (Check if applicable and write this amount in the space provided.)	$1,600		$	0.00

Separable Annual Costs

Cap repair and maintenance		0 acres x 0 (From Table One) =	$	0.00
☐ Leachate treatment (check if applicable)	0 acres x 0 (Gal/Acre/Year)	x (Cost per gallon) 0.00 =	$	0.00
☐ Leachate hauling (check if applicable)	0 acres x 0 (Gal/Acre/Year)	x $0.05 =	$	0.00

Annual Costs for Other Critical Design Features

Include total annual cost for maintenance of other critical design features. Attach separate sheet(s) for cost calculations. $ 0.00

Total Annual Post- Closure Cost (2004 Dollars) $69,700.00

Adjust for Inflation
Adjust Amount for 2004 dollars to present value

Annual closure cost 2004 Dollars $ x current Implicit Price Deflator*/* Please contact the Solid Waste Management Program, 573-526-5401, for the current IPD = $

Sum of all annual post – closure costs $ 82,510.86
(Reduction. On the sixth anniversary of receiving official closure, a facility can reduce the post-closure FAI by one year's worth of fund.)

Total Post-Closure Cost
Annual post-closure costs x ~~XX~~ years 20 $ 1,650,217.20

Appendix 4B

Closure and Post-Closure Cost Worksheet
Phase 1: 31.4 Acres

MISSOURI DEPARTMENT OF NATURAL RESOURCES
SOLID WASTE MANAGEMENT PROGRAM

CLOSURE AND POST-CLOSURE COST WORKSHEET

Phase 1

THIS WORKSHEET IS ONLY REQUIRED FOR THOSE FACILITIES THAT ACCEPT WASTE AFTER JAN. 1, 2004. OTHERS MAY USE THE WORKSHEET IF THEY CHOOSE.

DATE	NAME OF FACILITY	PERMIT NUMBER
1/10/13	Ameren Missouri Labadie Utility Waste Landfill	

TOTAL PERMITTED ACREAGE (INCLUDING UNDEVELOPED AREAS)		TOTAL ACREAGE WITH WASTE IN PLACE (INCLUDING OFFICIALLY CLOSED AREAS)		TOTAL ACREAGE WITH OFFICIAL CLOSURE APPROVAL	
SUBTITLE D	NON-SUBTITLE D	SUBTITLE D	NON-SUBTITLE D	SUBTITLE D	NON-SUBTITLE D
166.5	0	0	0	0	0

1. How many acres is this financial assurance instrument intended for?

   acres for closure 31.4 acres for post-closure 0

2. Description of area (cell number, etc.)

   Ameren Missouri Labadie Utility Waste Landfill (PHASE 1)

3. What is the approved final cover system design?

   ☒ Subtitle D: one foot of compacted clay overlain with a geomembrane, a drainage layer and two feet of vegetative soil.
   ☐ Standard soil cover: two feet of compacted clay overlain with one foot of vegetative soil.
   (If your facility has both subtitle D and non-subtitle D areas, separate worksheets are advisable for these areas to avoid confusion.)

4. Has an easement been granted to the Missouri Department of Natural Resources for access to and use of the borrow material for cap construction?

   ☒ Yes ☐ No

5. What is the average round-trip distance from the landfill (or phase) to the borrow area? Round trip distance should be to the nearest ½ mile if less than five miles. If more than five miles, round trip distance should be to the nearest mile. If the department does not have an easement to the borrow area, the round trip haul distance is assumed to be 10 miles.

   0.5 miles

6. What is the approximate volume of soil remaining in the borrow area?

   0 Clay (cubic yards)

   537,200 Vegetative soil (cubic yards)

7. What is the approved gas control system design?

   ☐ Active extraction system ☐ Passive venting system ☒ No gas control system

   If you have an active extraction system, check the appropriate box.

   ☐ a. Required to control gas migration
   ☐ b. Required under NSPS
   ☐ c. Required by other agency (city, county, etc.)
   ☐ d. Specified only by design engineer

   If you check box "d", is any part of the active gas system constructed at this time?

   ☐ Yes ☐ No If yes, provide a general description of the portion(s) of the system installed.

Note: Owners of Subtitle D facilities must provide a closure financial assurance instrument for either an active extraction system or a passive venting system. You must provide a closure FAI for an active system only when you are: 1) Required to install the system by the department to control off-site gas migration, or 2) Required to install the system under the Federal New Source Performance Standards, or NSPS, or 3) Required to install the system by another regulatory agency (city, county, etc.).
If you own a Subtitle D facility and meet any of the conditions, complete Form A. If you own a Subtitle D facility and do not meet any of these conditions, you are only required to provide a closure FAI for a passive venting system. Complete Form B if you own a non-Subtitle D facility (with a soil cap), you are not required to provide a closure FAI for a gas control system at all unless you also meet at least one of the above conditions. If you have installed any portion of an active gas control system, you must provide post-closure maintenance funds for the portion of the system constructed. Do this by checking the appropriate box on the post-closure cost worksheet and adding that amount to the total.

8. How many ground water monitoring wells do you have?
   28 wells

9. List the primary and secondary wastewater treatment plants used for leachate disposal, and the cost of disposal.
   (Primary plant) $ 0.0 per gallon (Secondary Plant) $ per gallon.
   ☐ Check if the facility discharges directly to a wastewater treatment plant.

10. What is the estimated post-closure leachate generation rate and how was it derived?
    (gal/acre/day) ☐ HELP model ☐ Other (please explain.)

OFFICIALLY CLOSED AREAS

11. If any areas of the landfill have been officially closed, list the following information.

Area	consisting of	acres received official closure	,	years post-closure.
Area	consisting of	acres received official closure	,	years post-closure.
Area	consisting of	acres received official closure	,	years post-closure.
Area	consisting of	acres received official closure	,	years post-closure.
Area	consisting of	acres received official closure	,	years post-closure.

CLOSURE COSTS

Final Cover System

Subtitle D (Composite cover)	31.4 acres x $ 72,910 per acre = (From Table One)		$ 2,289,374.00
Non – Subtitle D (soil cover)	acres x $ per acre = (From Table One)		$ 0.00

Gas Control System

Active extraction system (Complete Form A and write the amount in the right column.)	$	0.00
Passive gas venting system (Complete Form B and write the amount in the right column.)	$	0.00

Note: Owners are not required to provide an FAI for an **active** gas system unless required to install the system for one of the reasons listed under section 7 of this worksheet. However, owners of Subtitle D landfills are required to provide an FAI for a **passive** gas system if they do not provide one for an active system.

Other Critical Design Features

Include total cost for construction of other critical design features. Attach separate sheet(s) for cost calculations.	$	0.00
Total Closure Cost (sum of all lines) (2004 Dollars)	**$**	2,289,374.00

*** Inflation Update**
Adjust amount from 2004 dollars to present value.

Total closure cost 2004 dollars $ 2,289,374.00 x current Implicit Price Deflator * /*Please contact the Solid Waste Management Program, 573-526-5401, for the current IPD

$ 2,710,160.94

IPD 2004 4th Qtr = 97.874; IPD 2012 3rd Qtr = 115.860
(115.860 - 97.874) / 97.874 = 17.9860 / 97.874 = 0.1838
CURRENT IPD = 1.1838

POST-CLOSURE COSTS

Inseparable Annual Costs

Annual landfill inspection and reporting			$	~~1,000~~
Gas monitoring and reporting			$	~~4,450~~
Annual groundwater sampling and analysis cost.		28 wells x 2,000 =	$	56,000.00
Annual groundwater monitoring system maintenance and statistics cost.			$	13,700
☐ Leachate system maintenance (Check if applicable and write this amount in the space provided.)	$3,100		$	0.00
☐ Leachate testing (Check if applicable and write this amount in the space provided.)	$2,250		$	0.00
☐ Active gas extraction system maintenance and utilities (Check if applicable and write this amount in the space provided.)	$17,600		$	0.00
☐ Passive gas system maintenance (Check if applicable and write this amount in the space provided.)	$1,600		$	0.00

Separable Annual Costs

Cap repair and maintenance		0 acres x 0 (From Table One) =	$	0.00
☐ Leachate treatment (check if applicable)	0 acres x 0	x (Cost per gallon) 0.00 (Gal/Acre/Year) =	$	0.00
☐ Leachate hauling (check if applicable)	0	acres x 0 x $0.05 = (Gal/Acre/Year)	$	0.00

Annual Costs for Other Critical Design Features

Include total annual cost for maintenance of other critical design features. Attach separate sheet(s) for cost calculations. $ 0.00

Total Annual Post- Closure Cost (2004 Dollars) $69,700

Adjust for Inflation
Adjust Amount for 2004 dollars to present value

Annual closure cost 2004 Dollars $ x current Implicit Price Deflator*/* Please contact the Solid Waste Management Program, 573-526-5401, for the current IPD = $

Sum of all annual post – closure costs $ 82,510.86
(Reduction. On the sixth anniversary of receiving official closure, a facility can reduce the post-closure FAI by one year's worth of fund.)

Total Post-Closure Cost
Annual post-closure costs x ~~30~~ XX years 20 $ 1,650,217.20

Appendix 4C

Closure and Post-Closure Cost Worksheet
Phase 2: 35.2 Acres

MISSOURI DEPARTMENT OF NATURAL RESOURCES
SOLID WASTE MANAGEMENT PROGRAM

CLOSURE AND POST-CLOSURE COST WORKSHEET

PHASE 2

THIS WORKSHEET IS ONLY REQUIRED FOR THOSE FACILITIES THAT ACCEPT WASTE AFTER JAN. 1, 2004. OTHERS MAY USE THE WORKSHEET IF THEY CHOOSE.

DATE	NAME OF FACILITY	PERMIT NUMBER
1/10/13	Ameren Missouri Labadie Utility Waste Landfill	

TOTAL PERMITTED ACREAGE (INCLUDING UNDEVELOPED AREAS)		TOTAL ACREAGE WITH WASTE IN PLACE (INCLUDING OFFICIALLY CLOSED AREAS)		TOTAL ACREAGE WITH OFFICIAL CLOSURE APPROVAL	
SUBTITLE D	NON-SUBTITLE D	SUBTITLE D	NON-SUBTITLE D	SUBTITLE D	NON-SUBTITLE D
166.5	0	0	0	0	0

1. How many acres is this financial assurance instrument intended for?

   acres for closure 35.2 acres for post-closure 0

2. Description of area (cell number, etc.)

   Ameren Missouri Labadie Utility Waste Landfill (PHASE 2)

3. What is the approved final cover system design?

   ☒ Subtitle D: one foot of compacted clay overlain with a geomembrane, a drainage layer and two feet of vegetative soil.
   ☐ Standard soil cover: two feet of compacted clay overlain with one foot of vegetative soil.
   (If your facility has both subtitle D and non-subtitle D areas, separate worksheets are advisable for these areas to avoid confusion.)

4. Has an easement been granted to the Missouri Department of Natural Resources for access to and use of the borrow material for cap construction?

   ☒ Yes ☐ No

5. What is the average round-trip distance from the landfill (or phase) to the borrow area? Round trip distance should be to the nearest ½ mile if less than five miles. If more than five miles, round trip distance should be to the nearest mile. If the department does not have an easement to the borrow area, the round trip haul distance is assumed to be 10 miles.

   0.5 miles

6. What is the approximate volume of soil remaining in the borrow area?

   0 Clay (cubic yards)

   537,200 Vegetative soil (cubic yards)

7. What is the approved gas control system design?

   ☐ Active extraction system ☐ Passive venting system ☒ No gas control system

   If you have an active extraction system, check the appropriate box.
   ☐a. Required to control gas migration
   ☐b. Required under NSPS
   ☐c. Required by other agency (city, county, etc.)
   ☐d. Specified only by design engineer

   If you check box "d", is any part of the active gas system constructed at this time?
   ☐Yes ☐No If yes, provide a general description of the portion(s) of the system installed.

Note: Owners of Subtitle D facilities must provide a closure financial assurance instrument for either an active extraction system or a passive venting system. You must provide a closure FAI for an active system only when you are: 1) Required to install the system by the department to control off-site gas migration, or 2) Required to install the system under the Federal New Source Performance Standards, or NSPS, or 3) Required to install the system by another regulatory agency (city, county, etc.).
If you own a Subtitle D facility and meet any of the conditions, complete Form A. If you own a Subtitle D facility and do not meet any of these conditions, you are only required to provide a closure FAI for a passive venting system. Complete Form B if you own a non-Subtitle D facility (with a soil cap), you are not required to provide a closure FAI for a gas control system at all unless you also meet at least one of the above conditions. If you have installed any portion of an active gas control system, you must provide post-closure maintenance funds for the portion of the system constructed. Do this by checking the appropriate box on the post-closure cost worksheet and adding that amount to the total.

8. How many ground water monitoring wells do you have?
   0 wells

9. List the primary and secondary wastewater treatment plants used for leachate disposal, and the cost of disposal.
   (Primary plant) $ 0.00 per gallon (Secondary Plant) $ per gallon.
   ☐ Check if the facility discharges directly to a wastewater treatment plant.

10. What is the estimated post-closure leachate generation rate and how was it derived?
    0 (gal/acre/day) ☐ HELP model ☐ Other (please explain.)

OFFICIALLY CLOSED AREAS

11. If any areas of the landfill have been officially closed, list the following information.

Area	consisting of	acres received official closure	,	years post-closure.
Area	consisting of	acres received official closure	,	years post-closure.
Area	consisting of	acres received official closure	,	years post-closure.
Area	consisting of	acres received official closure	,	years post-closure.
Area	consisting of	acres received official closure	,	years post-closure.

CLOSURE COSTS

Final Cover System

Subtitle D (Composite cover)	35.2 acres x $ 72910 per acre = (From Table One)		$ 2,566,432.00
Non – Subtitle D (soil cover)	acres x $ per acre = (From Table One)		$ 0.00

Gas Control System

Active extraction system (Complete Form A and write the amount in the right column.)	$	0.00
Passive gas venting system (Complete Form B and write the amount in the right column.)	$	0.00

Note: Owners are not required to provide an FAI for an **active** gas system unless required to install the system for one of the reasons listed under section 7 of this worksheet. However, owners of Subtitle D landfills are required to provide an FAI for a **passive** gas system if they do not provide one for an active system.

Other Critical Design Features

Include total cost for construction of other critical design features. Attach separate sheet(s) for cost calculations.	$	0.00
Total Closure Cost (sum of all lines) (2004 Dollars)	**$**	2,566,432.00

*** Inflation Update**
Adjust amount from 2004 dollars to present value.

Total closure cost 2004 dollars $ 2,566,432.00 x current Implicit Price Deflator * /*Please contact the Solid Waste Management Program, 573-526-5401, for the current IPD

$ 3,038,142.20

IPD 2004 4th Qtr = 97.874; IPD 2012 3rd Qtr = 115.860

(115.860 - 97.874) divided by 97.874 = 17.9860 divided by 97.874 = 0.1838 (Current IPD = 1.1838)

POST-CLOSURE COSTS

Inseparable Annual Costs

Annual landfill inspection and reporting $ ~~1,000~~

Gas monitoring and reporting $ ~~4,450~~

Annual groundwater sampling and analysis cost. 0 wells x 2,000 = $ 0.00

Annual groundwater monitoring system maintenance and statistics cost. $ ~~13,700~~

☐ Leachate system maintenance $3,100 $ 0.00
(Check if applicable and write this amount in the space provided.)

☐ Leachate testing $2,250 $ 0.00
(Check if applicable and write this amount in the space provided.)

☐ Active gas extraction system maintenance and utilities $17,600 $ 0.00
(Check if applicable and write this amount in the space provided.)

☐ Passive gas system maintenance $1,600 $ 0.00
(Check if applicable and write this amount in the space provided.)

Separable Annual Costs

Cap repair and maintenance 0 acres x 0 (From Table One) = $ 0.00

☐ Leachate treatment (check if applicable) 0 acres x 0 x (Cost per gallon) 0.00 (Gal/Acre/Year) = $ 0.00

☐ Leachate hauling (check if applicable) 0 acres x 0 x $0.05 = $ 0.00
(Gal/Acre/Year)

Annual Costs for Other Critical Design Features

Include total annual cost for maintenance of other critical design features. Attach separate sheet(s) for cost calculations. $ 0.00

Total Annual Post- Closure Cost (2004 Dollars) $0.00

Adjust for Inflation
Adjust Amount for 2004 dollars to present value

Annual closure cost 2004 Dollars $ x current Implicit Price Deflator*/* Please contact the Solid Waste Management Program, 573-526-5401, for the current IPD = $

Sum of all annual post – closure costs $ 0.00
(Reduction. On the sixth anniversary of receiving official closure, a facility can reduce the post-closure FAI by one year's worth of fund.)

Total Post-Closure Cost
Annual post-closure costs x ~~30~~ years 20 $ 0.00

Appendix 4D

Closure and Post-Closure Cost Worksheet
Phase 3: 57.1 Acres

MISSOURI DEPARTMENT OF NATURAL RESOURCES
SOLID WASTE MANAGEMENT PROGRAM

CLOSURE AND POST-CLOSURE COST WORKSHEET

PHASE 3

THIS WORKSHEET IS ONLY REQUIRED FOR THOSE FACILITIES THAT ACCEPT WASTE AFTER JAN. 1, 2004. OTHERS MAY USE THE WORKSHEET IF THEY CHOOSE.

DATE	NAME OF FACILITY	PERMIT NUMBER
1/10/13	Ameren Missouri Labadie Utility Waste Landfill	

TOTAL PERMITTED ACREAGE (INCLUDING UNDEVELOPED AREAS)		TOTAL ACREAGE WITH WASTE IN PLACE (INCLUDING OFFICIALLY CLOSED AREAS)		TOTAL ACREAGE WITH OFFICIAL CLOSURE APPROVAL	
SUBTITLE D	NON-SUBTITLE D	SUBTITLE D	NON-SUBTITLE D	SUBTITLE D	NON-SUBTITLE D
166.5	0	0	0	0	0

1. How many acres is this financial assurance instrument intended for?

   acres for closure 57.1 acres for post-closure 0

2. Description of area (cell number, etc.)

   Ameren Missouri Labadie Utility Waste Landfill (PHASE 3)

3. What is the approved final cover system design?

   ☒ Subtitle D: one foot of compacted clay overlain with a geomembrane, a drainage layer and two feet of vegetative soil.
   ☐ Standard soil cover: two feet of compacted clay overlain with one foot of vegetative soil.
   (If your facility has both subtitle D and non-subtitle D areas, separate worksheets are advisable for these areas to avoid confusion.)

4. Has an easement been granted to the Missouri Department of Natural Resources for access to and use of the borrow material for cap construction?

   ☒ Yes ☐ No

5. What is the average round-trip distance from the landfill (or phase) to the borrow area? Round trip distance should be to the nearest ½ mile if less than five miles. If more than five miles, round trip distance should be to the nearest mile. If the department does not have an easement to the borrow area, the round trip haul distance is assumed to be 10 miles.

   0.5 miles

6. What is the approximate volume of soil remaining in the borrow area?

   0 Clay (cubic yards)

   537,200 Vegetative soil (cubic yards)

7. What is the approved gas control system design?

   ☐ Active extraction system ☐ Passive venting system ☒ No gas control system

   If you have an active extraction system, check the appropriate box.
   ☐a. Required to control gas migration
   ☐b. Required under NSPS
   ☐c. Required by other agency (city, county, etc.)
   ☐d. Specified only by design engineer

   If you check box "d", is any part of the active gas system constructed at this time?
   ☐Yes ☐No If yes, provide a general description of the portion(s) of the system installed.

Note: Owners of Subtitle D facilities must provide a closure financial assurance instrument for either an active extraction system or a passive venting system. You must provide a closure FAI for an active system only when you are: 1) Required to install the system by the department to control off-site gas migration, or 2) Required to install the system under the Federal New Source Performance Standards, or NSPS, or 3) Required to install the system by another regulatory agency (city, county, etc.).
If you own a Subtitle D facility and meet any of the conditions, complete Form A. If you own a Subtitle D facility and do not meet any of these conditions, you are only required to provide a closure FAI for a passive venting system. Complete Form B if you own a non-Subtitle D facility (with a soil cap), you are not required to provide a closure FAI for a gas control system at all unless you also meet at least one of the above conditions. If you have installed any portion of an active gas control system, you must provide post-closure maintenance funds for the portion of the system constructed. Do this by checking the appropriate box on the post-closure cost worksheet and adding that amount to the total.

8. How many ground water monitoring wells do you have?
   0 wells

9. List the primary and secondary wastewater treatment plants used for leachate disposal, and the cost of disposal.
   (Primary plant) $ 0.00 per gallon (Secondary Plant) $ per gallon.
   ☐ Check if the facility discharges directly to a wastewater treatment plant.

10. What is the estimated post-closure leachate generation rate and how was it derived?
    0 (gal/acre/day) ☐ HELP model ☐ Other (please explain.)

OFFICIALLY CLOSED AREAS

11. If any areas of the landfill have been officially closed, list the following information.

Area	consisting of	acres received official closure	,	years post-closure.
Area	consisting of	acres received official closure	,	years post-closure.
Area	consisting of	acres received official closure	,	years post-closure.
Area	consisting of	acres received official closure	,	years post-closure.
Area	consisting of	acres received official closure	,	years post-closure.

CLOSURE COSTS

Final Cover System

Subtitle D (Composite cover)	57.1 acres x $ 72910. per acre = (From Table One)		$ 4,163,161.00
Non – Subtitle D (soil cover)	acres x $ per acre = (From Table One)		$ 0.00

Gas Control System

Active extraction system (Complete Form A and write the amount in the right column.)	$	0.00
Passive gas venting system (Complete Form B and write the amount in the right column.)	$	0.00

Note: Owners are not required to provide an FAI for an **active** gas system unless required to install the system for one of the reasons listed under section 7 of this worksheet. However, owners of Subtitle D landfills are required to provide an FAI for a **passive** gas system if they do not provide one for an active system.

Other Critical Design Features

Include total cost for construction of other critical design features. Attach separate sheet(s) for cost calculations.	$	0.00
Total Closure Cost (sum of all lines) (2004 Dollars)	**$**	4,163,161.00

*** Inflation Update**
Adjust amount from 2004 dollars to present value.

Total closure cost 2004 dollars $ 4,163,161.00 x current Implicit Price Deflator * /*Please contact the Solid Waste Management Program, 573-526-5401, for the current IPD

$ 4,928,349.99

IPD 2004 4th Qtr = 97.874; IPD 2012 3rd Qtr = 115.860
(115.860 - 97.874) / 97.874 = 17.9860 divided by 97.874 = 0.1838
(CURRENT IPD = 1.1838)

POST-CLOSURE COSTS

Inseparable Annual Costs

Annual landfill inspection and reporting $ ~~4,000~~

Gas monitoring and reporting $ ~~4,450~~

Annual groundwater sampling and analysis cost. 0 wells x 2,000 = $ 0.00

Annual groundwater monitoring system maintenance and statistics cost. $ ~~13,700~~

☐ Leachate system maintenance $3,100 $ 0.00
(Check if applicable and write this amount in the space provided.)

☐ Leachate testing $2,250 $ 0.00
(Check if applicable and write this amount in the space provided.)

☐ Active gas extraction system maintenance and utilities $17,600 $ 0.00
(Check if applicable and write this amount in the space provided.)

☐ Passive gas system maintenance $1,600 $ 0.00
(Check if applicable and write this amount in the space provided.)

Separable Annual Costs

Cap repair and maintenance 0 acres x 0 (From Table One) = $ 0.00

☐ Leachate treatment (check if applicable) 0 acres x 0 x (Cost per gallon) 0.00 (Gal/Acre/Year) = $ 0.00

☐ Leachate hauling (check if applicable) 0 acres x 0 x $0.05 = $ 0.00
(Gal/Acre/Year)

Annual Costs for Other Critical Design Features

Include total annual cost for maintenance of other critical design features. Attach separate sheet(s) for cost calculations. $ 0.00

Total Annual Post- Closure Cost (2004 Dollars) $0.00

Adjust for Inflation
Adjust Amount for 2004 dollars to present value

Annual closure cost 2004 Dollars $ x current Implicit Price Deflator*/* Please contact the Solid Waste Management Program, 573-526-5401, for the current IPD = $

Sum of all annual post – closure costs $ 0.00
(Reduction. On the sixth anniversary of receiving official closure, a facility can reduce the post-closure FAI by one year's worth of fund.)

Total Post-Closure Cost
Annual post-closure costs x ~~30~~ years 20 $ 0.00

Appendix 4E

Closure and Post-Closure Cost Worksheet
Phase 4: 42.8 Acres

MISSOURI DEPARTMENT OF NATURAL RESOURCES
SOLID WASTE MANAGEMENT PROGRAM

CLOSURE AND POST-CLOSURE COST WORKSHEET

PHASE 4

THIS WORKSHEET IS ONLY REQUIRED FOR THOSE FACILITIES THAT ACCEPT WASTE AFTER JAN. 1, 2004. OTHERS MAY USE THE WORKSHEET IF THEY CHOOSE.

DATE	NAME OF FACILITY	PERMIT NUMBER
1/10/13	Ameren Missouri Labadie Utility Waste Landfill	

TOTAL PERMITTED ACREAGE (INCLUDING UNDEVELOPED AREAS)		TOTAL ACREAGE WITH WASTE IN PLACE (INCLUDING OFFICIALLY CLOSED AREAS)		TOTAL ACREAGE WITH OFFICIAL CLOSURE APPROVAL	
SUBTITLE D	NON-SUBTITLE D	SUBTITLE D	NON-SUBTITLE D	SUBTITLE D	NON-SUBTITLE D
166.5	0	0	0	0	0

1. How many acres is this financial assurance instrument intended for?

   42.8 acres for closure o acres for post-closure

2. Description of area (cell number, etc.)

   Ameren Missouri Labadie Utility Waste Landfill (PHASE 4)

3. What is the approved final cover system design?

   ☒ Subtitle D: one foot of compacted clay overlain with a geomembrane, a drainage layer and two feet of vegetative soil.
   ☐ Standard soil cover: two feet of compacted clay overlain with one foot of vegetative soil.
   (If your facility has both subtitle D and non-subtitle D areas, separate worksheets are advisable for these areas to avoid confusion.)

4. Has an easement been granted to the Missouri Department of Natural Resources for access to and use of the borrow material for cap construction?

   ☒ Yes ☐ No

5. What is the average round-trip distance from the landfill (or phase) to the borrow area? Round trip distance should be to the nearest ½ mile if less than five miles. If more than five miles, round trip distance should be to the nearest mile. If the department does not have an easement to the borrow area, the round trip haul distance is assumed to be 10 miles.

   0.5 miles

6. What is the approximate volume of soil remaining in the borrow area?

   0 Clay (cubic yards)

   537,200 Vegetative soil (cubic yards)

7. What is the approved gas control system design?

   ☐ Active extraction system ☐ Passive venting system ☒ No gas control system

   If you have an active extraction system, check the appropriate box.
   ☐a. Required to control gas migration
   ☐b. Required under NSPS
   ☐c. Required by other agency (city, county, etc.)
   ☐d. Specified only by design engineer

   If you check box "d", is any part of the active gas system constructed at this time?
   ☐Yes ☐No If yes, provide a general description of the portion(s) of the system installed.

Note: Owners of Subtitle D facilities must provide a closure financial assurance instrument for either an active extraction system or a passive venting system. You must provide a closure FAI for an active system only when you are: 1) Required to install the system by the department to control off-site gas migration, or 2) Required to install the system under the Federal New Source Performance Standards, or NSPS, or 3) Required to install the system by another regulatory agency (city, county, etc.).
If you own a Subtitle D facility and meet any of the conditions, complete Form A. If you own a Subtitle D facility and do not meet any of these conditions, you are only required to provide a closure FAI for a passive venting system. Complete Form B if you own a non-Subtitle D facility (with a soil cap), you are not required to provide a closure FAI for a gas control system at all unless you also meet at least one of the above conditions. If you have installed any portion of an active gas control system, you must provide post-closure maintenance funds for the portion of the system constructed. Do this by checking the appropriate box on the post-closure cost worksheet and adding that amount to the total.

8. How many ground water monitoring wells do you have?
   0 wells

9. List the primary and secondary wastewater treatment plants used for leachate disposal, and the cost of disposal.
   (Primary plant) $ 0.01 per gallon (Secondary Plant) $ per gallon.
   ☐ Check if the facility discharges directly to a wastewater treatment plant.

10. What is the estimated post-closure leachate generation rate and how was it derived?
    0 (gal/acre/day) ☐ HELP model ☐ Other (please explain.)

OFFICIALLY CLOSED AREAS

11. If any areas of the landfill have been officially closed, list the following information.

Area	consisting of	acres received official closure	,	years post-closure.
Area	consisting of	acres received official closure	,	years post-closure.
Area	consisting of	acres received official closure	,	years post-closure.
Area	consisting of	acres received official closure	,	years post-closure.
Area	consisting of	acres received official closure	,	years post-closure.

CLOSURE COSTS

Final Cover System

Subtitle D (Composite cover)	42.8 acres x $ 72,910. per acre = (From Table One)	$	3,120,548.00
Non – Subtitle D (soil cover)	acres x $ per acre = (From Table One)	$	0.00

Gas Control System

Active extraction system (Complete Form A and write the amount in the right column.)	$	0.00
Passive gas venting system (Complete Form B and write the amount in the right column.)	$	0.00

Note: Owners are not required to provide an FAI for an **active** gas system unless required to install the system for one of the reasons listed under section 7 of this worksheet. However, owners of Subtitle D landfills are required to provide an FAI for a **passive** gas system if they do not provide one for an active system.

Other Critical Design Features

Include total cost for construction of other critical design features. Attach separate sheet(s) for cost calculations.	$	0.00
Total Closure Cost (sum of all lines) (2004 Dollars)	**$**	3,120,548.00

*** Inflation Update**
Adjust amount from 2004 dollars to present value.

Total closure cost 2004 dollars $ 3,120,548.00 x current Implicit Price Deflator * /*Please contact the Solid Waste Management Program, 573-526-5401, for the current IPD

$ 3,694,104.72

IPD 2004 4th Qtr = 97.874; IPD 2012 3rd Qtr = 115.860
(115.860 - 97.874) / 97.874 = 17.9860 divided by 97.874 = 0.1838
CURRENT IPD = 1.1838

POST-CLOSURE COSTS

Inseparable Annual Costs

Annual landfill inspection and reporting			$ ~~1,000~~
Gas monitoring and reporting			$ ~~4,450~~
Annual groundwater sampling and analysis cost.		0 wells x 2,000 =	$
Annual groundwater monitoring system maintenance and statistics cost.			$ ~~13,700~~
☐ Leachate system maintenance (Check if applicable and write this amount in the space provided.)	$3,100		$ 0.00
☐ Leachate testing (Check if applicable and write this amount in the space provided.)	$2,250		$ 0.00
☐ Active gas extraction system maintenance and utilities (Check if applicable and write this amount in the space provided.)	$17,600		$ 0.00
☐ Passive gas system maintenance (Check if applicable and write this amount in the space provided.)	$1,600		$ 0.00

Separable Annual Costs

Cap repair and maintenance		0 acres x 0 (From Table One) =	$ 0.00
☐ Leachate treatment (check if applicable)	0 acres x 0	x (Cost per gallon) 0.00 (Gal/Acre/Year) =	$ 0.00
☐ Leachate hauling (check if applicable)	0	acres x 0 x $0.05 = (Gal/Acre/Year)	$ 0.00

Annual Costs for Other Critical Design Features

Include total annual cost for maintenance of other critical design features. Attach separate sheet(s) for cost calculations. $ 0.00

Total Annual Post- Closure Cost (2004 Dollars) $0.00

Adjust for Inflation
Adjust Amount for 2004 dollars to present value

Annual closure cost 2004 Dollars $ x current Implicit Price Deflator*/* Please contact the Solid Waste Management Program, 573-526-5401, for the current IPD = $

Sum of all annual post – closure costs $ 0.00
(Reduction. On the sixth anniversary of receiving official closure, a facility can reduce the post-closure FAI by one year's worth of fund.)

Total Post-Closure Cost
Annual post-closure costs x ~~XX~~ years 20 $ 0.00

Appendix 4F

MDNR "Table 1 – Cover Systems Construction And Repair Costs," dated 11/2010

MISSOURI DEPARTMENT OF NATURAL RESOURCES
SOLID WASTE MANAGEMENT PROGRAM

TABLE 1 – COVER SYSTEMS CONSTRUCTION AND REPAIR COSTS

HAUL DISTANCE (Miles)	SUBTITLE D COVER		STANDARD SOIL COVER		CAP REPAIR/ MAINTENANCE	
	1	2	3	4	5	6
	Easement	No Easement	Easement	No Easement	Easement	No easement
1/2	$72,910		$38,300		$256	
1	$74,910		$40,300		$265	
1.5	$76.000		$41,390		$269	
2	$78,200		$43,590		$278	
2.5	$79,100		$44,480		$281	
3	$81,140		$46,530		$290	
3.5	$82,190		$47,570		$294	
4	$83,730		$49,120		$300	
4.5	$87,720		$53,110		$316	
5	$91,710		$57,100		$332	
6	$93,550		$58,940		$340	
7	$95,400		$60,780		$347	
8	$97,240		$62,630		$355	
9	$99,090		$64,470		$362	
10	$100,930	$136,290	$66,320	$93,460	$370	$525
11	$102,580		$67,960		$376	
12	$104,170		$69,560		$383	
13	$105,820		$71,200		$390	
14	$107,410		$72,800		$396	
15	$109,010		$74,390		$402	
16	$110,650		$76,040		$409	
17	$112,300		$77,680		$416	
18	$113,890		$79,280		$422	
19	$115,540		$80,920		$429	
20	$117,130		$82,520		$435	

All costs are per acre costs.

Round trip distances should be to the nearest ½ mile when less than five miles. For distances greater than five miles, round trip distances should be to the nearest mile.

If an easement has been granted to the department for the borrow area, use the per acre cost from the "Easement" column corresponding to the haul distance. If no easement has been granted to the department, the round trip haul distance is assumed to be 10 miles. Enter the correct figure in the Closure Post-Closure Cost Worksheet.