

Appeal to Franklin County
Board of Zoning Adjustment

Of Land Use Administrator Decisions of
October 10, 2013 and December 10, 2013
(incorporating by reference decisions of
September 18, 2013)

Applicants: Ruth Campbell, Nancy Campbell,
Euline and Edwin Elzemeyer, Jr., Richard and
Loraine Stettes, Kara Carter, Jennifer Carter
Norris, Katherine Carter Thomas, and Labadie
Environmental Organization

January 8, 2014

Franklin County Board of Zoning Adjustment Appeal

Submit the following information:

1. Completed Application

2. General Warranty Deed (if applicable)

3. Deposit - \$600

Section A: Applicant Information

Applicant Names: Ruth Campbell, Nancy Campbell, Edwin Elzemeyer, Jr. and Euline Elzemeyer, Richard and Loraine Stettes, Kara Carter, Jennifer Carter Norris, Katherine Carter Thomas, and Labadie Environmental Organization

Mailing Address: Applicants' Attorney, Maxine Lipeles, Interdisciplinary Environmental Clinic, Washington University School of Law, One Brookings Drive, CB 1120

City, State, Zip +4: St. Louis, MO 63130-4899 See Attachment A for additional Applicant Information

Phone: 314-935-5837

Fax: 314-935-5171

Email: milipele@wulaw.wustl.edu

Section B: Property Location and Description

Township:

44 North

Range 2 East

Section 8 and 17

Tax/Parcel ID Number (16 Digits): see Attachment B

Development Site Address: Across Labadie Bottom Road from Labadie power plant, to the east

Zoning District: Agricultural Non-Urban

Political Township: Boles

Total Acres: approx. 1041

Subdivision Name:

Lot Number

Section C: Appeal

Now comes the above-listed applicant, living at the above mailing address, appealing an order or determination of the:

Land Use Administrator (Article 4, Section 84) OR Planning & Zoning Commission (Article 4, Section 82)

of Franklin County, made on the 10th day of October 2013, arising out of the following situation involving the property described above in Section B (please include File Number, if applicable, and attach additional pages, if needed):

This appeal arises out of the Land Use Administrator's erroneous decisions and determinations of October 10, 2013 and December 10, 2013 (and her letter of September 18, 2013 incorporated by reference) that Ameren Missouri ("Ameren") has satisfied all applicable requirements of the Franklin County Unified Land Use Regulations ("Land Use Regulations") applicable to Ameren's proposal to construct a utility waste landfill adjacent to its Labadie power plant.

It is alleged by the applicants that the decisions made are erroneous because:

- (1) Ameren's proposed landfill is not two feet above the natural water table, as required by §238(C)(3)(c) of the Land Use Regulations; and
- (2) Ameren has not obtained a zoning permit required by § 46(a) of the Land Use Regulations.

See also Attachment C – Summary of Appeal

Signature of Applicant

X *Maxine Lipeles, attorney for Applicants*

Date: 1/8/14

Paid Date

Check #

Fee

Cash

Attachment A – Applicant Information

1. Ruth Campbell owns and resides on 63 acres of property that is approximately 0.02 mile from Ameren Missouri's Labadie power plant property and approximately 0.4 mile from Ameren's proposed utility waste landfill site. She relies on a groundwater well for drinking water and other domestic purposes, and is concerned that the construction and operation of Ameren's proposed landfill in the Missouri River floodplain and floodway near her property will contaminate her groundwater well, threaten her health, and reduce the value of her property. She is also concerned that air pollution from the proposed landfill near her property will endanger her health.

2. Nancy Campbell owns and resides on three acres of property that is approximately 0.6 mile from Ameren Missouri's Labadie power plant property and approximately 0.9 mile from Ameren's proposed utility waste landfill site. She also has an inheritance interest in her mother Ruth Campbell's property, described above. She relies on a groundwater well for drinking water and other domestic purposes, and is concerned that the construction and operation of Ameren's proposed landfill in the Missouri River floodplain and floodway near her property will contaminate her groundwater well, threaten her health, and reduce the value of her property. She is also concerned that contamination of her groundwater well will adversely affect the operation of an alpaca-raising business on her property.

3. Edwin and Euline Elzemeyer own 80 acres of bottomland directly adjacent to Ameren Missouri's Labadie power plant property and approximately 0.9 mile from Ameren's proposed utility waste landfill site. Edwin also shares ownership of 274 acres of property, where Edwin and Euline live part-time, that is approximately 0.6 mile from Ameren's proposed utility waste

landfill site. They are concerned that the construction and operation of Ameren's proposed landfill in the Missouri River floodplain and floodway near their bottomland will increase flooding of their bottomland property and reduce its value due to groundwater contamination or flooding or both. They are also concerned that the construction and operation of Ameren's proposed landfill in the Missouri River floodplain and floodway near their other property will contaminate the groundwater well on which they rely for drinking water and other domestic purposes, threaten their health, and reduce the value of such property.

4. Richard and Loraine Stettes are lifelong residents of the Labadie area and own 18 acres of property that is approximately 0.3 mile from Ameren's proposed utility waste landfill site. They are concerned that the construction and operation of Ameren's proposed landfill in the Missouri River floodplain and floodway near their property will contaminate their groundwater well used for domestic purposes, contaminate their land through flooding or groundwater contamination or both, increase flood damage to their property, pollute the air that they breathe, threaten their health, and reduce the value of their property.

5. Kara Carter owns property that overlooks and is approximately 1 mile from Ameren's proposed utility waste landfill site. She is concerned that the construction and operation of Ameren's proposed landfill in the Missouri River floodplain and floodway near her property will contaminate the groundwater well on which she relies for domestic purposes, pollute the air she breathes, impair her view of the floodplain, threaten her health, and reduce the value of her property.

6. Jennifer Carter Norris owns property that overlooks and is approximately 0.9 mile from Ameren's proposed utility waste landfill site. She is concerned that the construction and

operation of Ameren's proposed landfill in the Missouri River floodplain and floodway near her property will contaminate the groundwater well on which she relies for domestic purposes, impair her view of the floodplain, threaten her health, and reduce the value of her property.

7. Katherine Carter Thomas owns property that overlooks and is approximately 0.8 mile from Ameren's proposed utility waste landfill site. She is concerned that the construction and operation of a coal ash landfill in the Missouri River floodplain and floodway near her property will contaminate the groundwater well on which she relies for domestic purposes, impair her view of the floodplain, threaten her health, and reduce the value of her property. Such concerns have caused her to abandon plans to build a new house on her property.

8. The Labadie Environmental Organization, Inc. ("LEO") is a non-profit corporation in good standing organized under the laws of the State of Missouri. LEO is a grassroots, non-partisan, citizens group engaged in advocacy seeking to prevent the siting of a coal ash landfill in the Missouri River floodplain and floodway. Individual Applicants are also members of LEO. Individual Applicants and other LEO members who own property and reside near Ameren's Labadie plant and proposed landfill site are concerned that the construction and operation of a coal ash landfill in the Missouri River floodplain and floodway will contaminate their groundwater wells, contaminate their land, pollute the air they breathe, increase truck traffic near their homes, increase flood damage to their properties, adversely affect their views of the floodplain, impair their use and enjoyment of their properties, and reduce the value of their properties.

Attachment B: Tax/Parcel ID Numbers:

Based on documents submitted by Ameren to Franklin County Planning and Zoning in March 2010, Applicants understand that the proposed landfill site involves some or all of the following parcels:

08-2-09.0-0-001-004.000; 08-3-08.0-0-002-005.300; 08-3-08.0-0-002-005.000; 08-3-08.0-0-000-006.000;
08-3-08.0-0-000-007.000; 08-3-08.0-0-001-008.000; 08-4-17.0-0-002-004.000; 08-4-17.0-0-000-003.000;
08-4-17.0-0-000-002.000; 08-4-17.0-0-001-001.000; 08-4-17.0-0-001-006.000; 08-4-20.0-0-001-010.000;
08-4-20.0-0-000-008.100; 08-4-20.0-0-000-006.000; 08-4-20.0-0-000-005.000; 08-5-16.0-0-001-004.000;
08-5-16.0-0-001-005.000

Attachment C – Summary of Appeal

I. Background:

Between 2007 and 2009, Ameren Missouri (“Ameren”) acquired approximately 1100 acres of farmland in the floodplain adjacent to its Labadie power plant for the purpose of constructing and operating a utility waste (also known as coal ash) landfill. At that time, the Unified Land Use Regulations of Franklin County (“Land Use Regulations”) prohibited landfills. Ameren submitted to the County proposed amendments to the Land Use Regulations to allow Ameren’s proposed landfill as a permitted use. On October 25, 2011, the County Commission adopted utility waste landfill amendments to the Land Use Regulations.¹

In January 2013, Ameren submitted to the Missouri Department of Natural Resources (“DNR”) a construction permit application for a proposed utility waste landfill adjacent to the Labadie plant. Ameren submitted revised applications to DNR in August 2013 and December 2013.

State law requires that a landfill applicant demonstrate compliance with local zoning requirements.² With its December 2013 application, Ameren submitted a series of letters from the Franklin County Land Use Administrator (also known as its Planning Director) dated September 18, 2013, October 10, 2013, and December 10, 2013.³ In the September 18 letter, the Land Use Administrator stated that

Ameren Missouri and the activity which is the subject of the Application is in compliance with all applicable local zoning ... codes, ordinances and orders.⁴

The October 10 letter made corrections to other aspects of the September 18 letter,⁵ and the December 10 letter clarified other aspects of the September 18 and October 10 letters. However, in all three letters the Land Use Administrator stated or implied that Ameren’s application satisfies County zoning requirements. The December 10 letter incorporated by reference the provisions of the September 18 and October 10 letters that were not otherwise

¹ Applicants are separately challenging the validity of the Commission’s decision adopting the landfill amendments in a state court proceeding, which is currently pending before the Missouri Court of Appeals. *State of Missouri ex rel. Ruth Campbell, et al. v. County Commission of Franklin County*, No. ED99622. While the pending case addresses the validity of the landfill amendments, this appeal concerns their implementation. Should applicants prevail in that proceeding, then the issues herein would become moot. Should the County Commission and Ameren prevail, that would have no effect on this appeal.

² § 260.003, R.S.Mo.; 10 CSR 80-2.020(2)(A)2.E and 10 CSR 80-2.020(6).

³ The Land Use Administrator’s letters to DNR dated September 18, 2013, October 10, 2013, and December 10, 2013 are attached hereto in Tab 1, BOZA App. 1-6.

⁴ Tab 1, BOZA App. 1.

⁵ Ameren drafted the October 10, 2013 letter for the County. Within minutes of receiving it, the County Counselor directed the Land Use Administrator to print it on County letterhead and send it to DNR. Ameren’s draft letter and related e-mails are attached hereto in Tab 2, BOZA App. 7-9.

corrected or clarified – including the statement quoted above as to Ameren’s compliance with local zoning requirements.

Applicants appeal the Land Use Administrator’s decisions and determinations, as set forth in this series of letters, that Ameren’s landfill application complies with Franklin County zoning requirements.

II. Erroneous decisions and determinations by Land Use Administrator regarding Ameren’s proposed utility waste landfill:

A. The Land Use Administrator’s decisions and determinations that Ameren’s proposed landfill complies with the County’s zoning regulations is erroneous because the landfill liner will not be at least two feet above the Natural Water Table.

1. Legal requirement:⁶

The amended Land Use Regulations establish design requirements for a utility waste landfill. One such requirement is that the liner underlying the landfill be at least two feet above the groundwater table.

The clay or composite soil component at the base of the Utility Waste Landfill shall be at least two (2) feet above the Natural Water Table in the site area.⁷

This requirement is more protective than the standards in the Missouri Department of Natural Resources (“DNR”) regulations, and resembles proposed federal regulations.⁸

2. Key facts regarding Land Use Administrator’s erroneous decisions and determinations:

Ameren’s application identifies the Natural Water Table at the proposed site at elevation 464.⁹ Its application indicates three separate reasons why the landfill’s liner would not be two feet above the Natural Water Table at that elevation:

⁶ The landfill amendments to the Land Use Regulations and other provisions in the Regulations directly relevant to this appeal are attached hereto in Tab 3.

⁷ Land Use Regulations, Article 10, § 238(C)(3)(c). See Tab 3 at BOZA App.150.

⁸ EPA, Hazardous and Solid Waste Management; Identification and Listing of Special Wastes; Disposal of Coal Combustion Residuals from Electric Utilities; Proposed Rule, 75 Fed. Reg. 35128, 35241 (June 21, 2010), proposed 40 CFR § 257.60(a). EPA is under court order to finalize the proposed regulations. *Appalachian Voices v. Gina McCarthy*, 2013 WL 5797633 (D.D.C., Oct. 29, 2013).

- Liner at sumps: Ameren concedes that the liner at the sumps will actually be nearly two feet below – not above – the Natural Water Table (i.e. at elevation 462.2 after settlement). See (a) below.
- Liner elsewhere at the landfill – groundwater above elevation 464: Ameren concedes that groundwater levels exceed 464 during wet portions of the year, approaching 465 in the northwest portion of the site. See (b) below.
- Liner elsewhere at the landfill – liner below elevation 466: While Ameren plans to build the liner at elevation 466 – two feet above the elevation it claims to be the Natural Water Table – settlement will sink the liner to lower elevations, reducing the clearance between the liner and groundwater to less than two feet. See (c) below.

a. Ameren’s Application States That Portions of the Landfill Liner “Will Probably Be In Intermittent Contact With Ground Water.”

Each of the successive applications Ameren filed with DNR contains the same Appendix Z, “Demonstration: Base of Utility Waste Landfill Liner in Intermittent Contact with Ground Water,” dated November 12, 2012. Appendix Z admits that portions of the proposed landfill – the sumps – “will probably be in intermittent contact with the ground water.”¹⁰ Similarly, the main report constituting Ameren’s application states:

[T]he site conditions will result in intermittent contact of a small percentage of the constructed bottom liner (primarily at the sumps) with the alluvial groundwater.¹¹

Ameren states that the Natural Water Table at the proposed landfill site is at elevation 464, and that the bottom of the liner at the landfill’s sumps (where contaminants that leach out of the coal ash are directed by the landfill’s drainage system) will be well below that elevation.

The bottom of the composite clay liner in the sumps is designed to be at el. 463.0. With settlement, the bottom of the clay of the composite liner in the sumps is estimated to be at el. 462.2.¹²

Thus, Ameren’s application states that the liner at the landfill’s sumps, where contaminants are collected, will be nearly two feet below – not two feet above – the Natural Water Table. Ameren expressly admits that this means that groundwater will come in contact with the liner –

⁹ Appendix Z of Ameren’s application at 6 (Tab 2, BOZA App. 18). Appendix Z is attached hereto at Tab 2, BOZA App. 10-39. Applicants do not agree with Ameren’s method of defining the Natural Water Table, but use Ameren’s elevation for purposes of this appeal without waiving the right to challenge its definition in other proceedings.

¹⁰ Appendix Z at 2 (Tab 2, BOZA App. 14).

¹¹ Ameren Missouri, Construction Permit Application for a Proposed Utility Waste Landfill, Franklin County, Missouri, January 2013, Revised August 2013, Revised November 2013, at 1-1. Attached hereto in Tab 2, BOZA App. 40-117.

¹² Appendix Z at 3 (Tab 2 at BOZA App. 15).

defeating the evident purpose of the County's requirement of a two-foot clearance between the liner and the groundwater.

An intermittent high ground water table will first come in contact with the bottom of the compacted clay liner in the sumps.¹³

Thus, the Land Use Administrator erroneously decided and determined that Ameren's application complies with County zoning requirements. In fact, Ameren's application violates the County's zoning requirement that the bottom of the landfill be at least two feet above the groundwater.

b. Ameren's Groundwater Data Indicate That the Proposed Landfill is Less Than Two Feet Above Groundwater.

With respect to non-sump portions of the landfill, Ameren's data demonstrate that the elevation of the proposed liner is less than two feet above groundwater levels measured by Ameren the proposed landfill site.¹⁴

Ameren's application states that the liner below the landfill will be at elevation 466¹⁵ and that the Natural Water Table for purposes of the County's two-foot clearance requirement is at elevation 464.¹⁶ Yet Ameren also admits that average measured groundwater levels it measured as part of the DNR permitting process were nearly at elevation 465 in a portion of the site for a sustained period of time:

From June 5, 2010, through July 5, 2010, ... the average ground water table below the site rose to el. 464, with the average ground water table approaching el. 465 in the northwest portion of the site.¹⁷

In short, Ameren's data indicate that the liner will be less than two feet, and in fact only one foot, above its defined Natural Water Table during periods of high groundwater. While Ameren's application again demonstrates that the proposed landfill will not satisfy the County's requirement for a two-foot barrier between the landfill and the groundwater below the site, the Land Use Administrator erroneously decided and determined that Ameren's application complies with County zoning.

¹³ Id.

¹⁴ Ameren presented the groundwater elevations that it measured at the proposed site in Table 3 of the Detailed Site Investigation. Table 3 is attached hereto in Tab 2, BOZA App. 118-119. Ameren references these data in Appendix Z.

¹⁵ Appendix Z at 2 (Tab 2, BOZA App. 14).

¹⁶ Id. at 4-6 (Tab 2, BOZA App. 16-18) and "Design Basis for Ground Water Level," April 9, 2012, attached to Appendix Z (Tab 2, BOZA App. 30-35).

¹⁷ Id. at 5 (Tab 2, BOZA App. 17).

c. Ameren's Claim that the Liner Will be Two Feet Above the Natural Water Table Fails to Account for Settlement of the Liner.

The liner's elevation at the time of initial construction will be higher than its elevation after settlement. Throughout its application, Ameren acknowledges that settlement is a natural process that will occur at the site. Indeed, Ameren provides a post-settlement elevation for the liner at the sumps (see section (a) above). While Ameren fails to provide a post-settlement elevation for the liner elsewhere across the site, it will necessarily be below 466. Therefore, Ameren's proposed landfill will not meet, and will not be designed to meet, the two-foot clearance requirement of the County zoning regulations. The Land Use Administrator erroneously decided and determined that Ameren's application complies with County zoning.

B. The Land Use Administrator erroneously decided and determined that Ameren is not required to obtain any additional permits from the County when Ameren has not obtained a zoning permit.

1. Legal requirement:

Section 46(a) of the County's Land Use Regulations provides as follows:

The use made of property may not be substantially changed (see Section 229), substantial clearing, grading, or excavation may not be commenced, and buildings or other substantial structures may not be constructed, erected, moved, or substantially altered except in accordance with and pursuant to one of the following permits:

- (1) A zoning permit issued by the Administrator.
- (2) A conditional use permit issued by the Planning and Zoning Commission.¹⁸

Ameren's proposal to change substantially the use of floodplain farmland to landfill, and/or to conduct substantial clearing, grading, or excavation for construction of the proposed landfill, requires a zoning permit issued by the Administrator under § 46(a)(1).

2. Key facts regarding Land Use Administrator's erroneous decisions and determinations:

The Administrator has not issued a zoning permit for Ameren's proposed utility waste landfill.

While the Administrator's September 18, 2013 letter to DNR stated that Ameren's landfill application to DNR "is now sufficient for the County to issue a construction permit under the

¹⁸ Tab. 3, BOZA App.160.

County's Land Use Regulations (including, for emphasis, the Landfill Ordinance),"¹⁹ the Administrator's October 10, 2013 letter disclaims the need for a construction permit. That letter states that, apart from the floodplain permit previously issued by the County, Ameren does not need any additional County permits in order to build the proposed landfill: "There are no outstanding or required County permit applications for the Proposed UWL."²⁰ This determination is erroneous under § 46(a)(1) of the Land Use Regulations.

Of note, Ameren has submitted two Utility Waste Landfill Applications to the County, each with a \$50,000 fee, in June 2012 and August 2013.²¹ Indeed, on August 27, 2013, the County Counselor sent the following inquiry to the Highway Department Engineer: "AMEREN is required to pay \$50,000 annually with regard to its license. Please check with your contacts to see when they plan on paying this."²² After numerous Sunshine Law requests, appellants have found no "license" or "permit" issued by the County to Ameren for the proposed landfill.

The County's Land Use Regulations will eventually require Ameren to obtain an operating license, which involves a \$50,000 annual fee – if the proposed landfill first receives permission to be constructed. Land Use Regulations, § 238(C)(4). It is curious, however, that Ameren submitted two applications and paid two \$ 50,000 fees for an operating license when it lacks permission to begin construction.²³

While the landfill provisions of the Land Use Regulations do not include a construction permit requirement, nothing in the Land Use Regulations exempts Ameren from the requirement to obtain a zoning permit under § 46(a)(1) of the Regulations. The Administrator erroneously determined that Ameren does not need any additional County approvals prior to commencing construction.

Conclusion

Applicants respectfully request that the Board of Zoning Adjustment reverse the Land Use Administrator's decisions and determinations of September 18, October 10, and December 10, 2013 that Ameren has satisfied all applicable requirements under the Land Use Regulations to commence landfill construction.

Respectfully submitted,

¹⁹ Tab 1, BOZA App. 2 (emphasis supplied).

²⁰ Tab 1, BOZA App. 3.

²¹ Ameren's applications are attached hereto at Tab 2, BOZA App. 120-131.

²² The County Counselor's e-mail of August 27, 2013 is attached hereto at Tab 2, BOZA App. 132. Ameren had, in fact, submitted a landfill application, with a second \$50,000 fee, on August 26, 2013.

²³ In addition to the zoning permit required under § 46(a)(1) of the Land Use Regulations, Ameren must obtain a construction permit from DNR and a certificate of convenience and necessity from the Public Service Commission.

Maxine I. Lipeles

Maxine I. Lipeles

Co-Director, Interdisciplinary Environmental Clinic

Washington University School of Law

One Brookings Drive – CB 1120

St. Louis, MO 63130

314-935-5837 (phone); 314-935-5171 (fax)

milipele@wulaw.wustl.edu

Attorneys for Applicants Ruth Campbell et al.

Index of Exhibits Attached to Appeal

Page

Tab 1 – Administrator Decisions at Issue

September 18, 2013 Letter, County to Missouri Department of Natural Resources
 ("DNR").....BOZA App.1

October 10, 2013 Letter, County to DNR.....BOZA App.3

December 10, 2013 Letter, County to DNR.....BOZA App.5

Tab 2 – Documents Cited in Summary of Appeal

Ameren draft of October 10, 2013 County Letter to DNR, including transmittal
 e-mail.....BOZA App.7

Appendix Z, Demonstration: Base of Utility Waste Landfill Liner in Intermittent Contact
 With Ground Water.....BOZA App.10

Construction Permit Application, January 2013, Revised August 2013,
Revised November 2013.....BOZA App.40

Table 3 of Detailed Site Investigation, Monthly Groundwater Monitoring Data.....BOZA App.118

Ameren’s Initial Utility Waste Landfill Application to Franklin County,
 June 2012.....BOZA App.120

Ameren’s Utility Waste Landfill Renewal Application to Franklin County,
 August 2013.....BOZA App.128

County Counselor e-mail re renewal application.....BOZA App.132

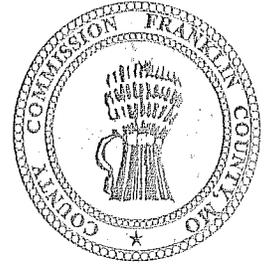
Tab 3 – Land Use Regulations – landfill amendments and other relevant provisions

Landfill Amendments, Article 10, see § 238.....BOZA App.133

Permit Requirements and Appeal Provisions, Articles 3 and 4.....BOZA App.155

FRANKLIN COUNTY

PLANNING & ZONING DEPARTMENT
PUBLIC WORKS DIVISION



400 EAST LOCUST STREET
ROOM 003B
UNION, MO 63084
MAIN LINE (636) 583-6369
FAX (636) 583-7911
www.franklinmo.org

September 18, 2013

Missouri Department of Natural Resources
ATTN: Charlene S. Fitch, P.E.
P.O. Box 176
Jefferson City, MO 65102

Re: Ameren Missouri Construction Permit Application to the Missouri Department of Natural Resources ("MDNR") originally deemed complete on February 7, 2013, and amended by letter dated August 7, 2013 and enclosures therewith (as amended at any time, the "Application") for a Proposed Utility Waste Landfill ("Proposed UWL")

Dear Ms. Fitch:

This letter is written pursuant to the provisions of Section 260.003 of the Revised Statutes of Missouri and 10 CSR 80-2.020 of the Missouri Code of State Regulations. The undersigned is the Planning Director for Franklin County, Missouri (the "County") and is authorized to issue this certification on behalf of the County.

The County has reviewed plans submitted by Ameren Missouri to MDNR pursuant to the Application, under your Solid Waste Management Program ("SWMP"). This review has included the submittal package provided to MDNR by Ameren Missouri's letter dated August 7, 2013.

Specifically, we have reviewed such plans and the Application under the County's Unified Land Use Regulations governing zoning, subdivision and related land use matters (as amended at any time, the "Land Use Regulations"). The Land Use Regulations include a new Section 238, which was adopted by the County by County Commission Order 2011-307, dated October 25, 2011. Section 238 pertains to landfills, including Utility Waste Landfills (Section 238 is hereinafter called the "Landfill Ordinance").

Our review has been conducted in accordance with the Land Use Regulations and Landfill Ordinance and specifically, a review has been completed by the County Engineer and by the Independent Registered Professional Engineer ("IRPE"), as defined therein.

We hereby certify as follows:

1. Under the Land Use Regulations, the real property which is the subject of the Application (the "Property") is located within the "Agricultural Non-Urban (ANU)" zoning district. The use of the Property for the Proposed UWL is a permitted use, provided that the Proposed UWL complies with the Landfill Ordinance. No Conditional Use Permit is required for such use.

Planning & Zoning Commission
Office of Zoning Enforcement

Floodplain Administration and Map Repository
Board of Zoning Adjustment

2. Ameren Missouri and the activity which is subject of the Application is in compliance with all applicable local zoning, building and health codes, ordinances and orders with regard to Ameren Missouri and such activity is regulated pursuant to Chapter 260 of the Revised Statutes of Missouri.
3. Ameren Missouri has applied to the County for all permits required under the Landfill Ordinance and the other Land Use Regulations. Ameren Missouri, by letter of July 8, 2013, informed us of proposed revisions to its plans for the Propose UWL, in response to comments by the County and the IRPE under the Landfill Ordinance. As noted above, by letter of August 7, 2013. Ameren Missouri submitted a formal revision to the Application, with revised plans and other documents. We certify that the Application is now sufficient for the County to issue a construction permit under the County's Land Use Regulations (including, for emphasis, the Landfill Ordinance).
4. The Proposed UWL must also comply with the provisions of the County's floodplain ordinance included within the Land Use Regulations, applicable to development in the floodway and floodplain. Ameren Missouri applied for and was issued this permit on March 19, 2013. A copy is attached. This permit is still valid and in force.
5. Except as noted above, there are no other County certificates, licenses, permits or other approval required in order to engage in the Proposed UWL use.

If you have any questions regarding this letter, please contact the Planning and Zoning office at 636-583-6369.

Sincerely,

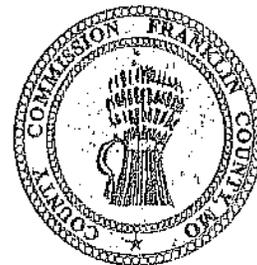


Mrs. Scottie C. Eagan
Planning Director

Cc: Kenneth Liss - Andrews Engineering
Joe Feldman
Craig Ceismann - Ameren Missouri

FRANKLIN COUNTY

PLANNING & ZONING DEPARTMENT
PUBLIC WORKS DIVISION



400 EAST LOCUST STREET
ROOM 003B
UNION, MO 63084
MAIN LINE (636) 583-6369
FAX (636) 583-7911
www.franklinmo.org

October 10, 2013

Missouri Department of Natural Resources
ATTN: Charlene S. Fitch, P.E.
P.O. Box 176
Jefferson City, MO 65102

Re: Ameren Missouri Construction Permit Application to the Missouri Department of Natural Resources ("MDNR") originally deemed complete on February 7, 2013, and amended by letter dated August 7, 2013 and enclosures therewith (as amended at any time, the "Application") for a Proposed Utility Waste Landfill ("Proposed UWL")

Dear Ms. Fitch:

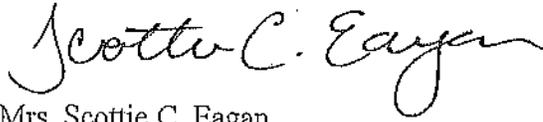
Thank you for your letter of October 2, 2013, asking for clarification of our letter of September 18, 2013. We off the following clarifications to your numbered questions:

1. We believe you have received directly from the County's Independent Registered Professional Engineer ("IRPE"), by e-mail of September 27, 2013, a copy of a clarification letter from the IRPE to the County. Since that date we have held several discussions with the IRPE and received written revisions to its original comments. The IRPE has now completed its review of the Ameren Application (to MDNR). The IRPE comments (including the points in its September 27, 2013 letter) have been addressed by the Applicant to the satisfaction of the County, and we can certify that review and comment by the IRPE is complete in accordance with the Landfill Ordinance. Specifically, by letter dated October 9, 2013, the Applicant has committed to install two additional groundwater monitoring wells, one of 80-100 feet in depth.
2. Contrary to any implication in our September 18, 2013 letter, notably paragraphs 3 and 5 thereof, the County does not issue a construction permit under its Landfill Ordinance. We apologize for any confusion. The Landfill Ordinance does require an operating license after completion of construction, but this requirement only applies prior to commencement of operations. There are no outstanding or required County permit applications for the Proposed UWL.

Except as clarified hereby, we confirm our September 18, 2013 letter.

If you have any questions regarding this letter, please contact the Planning and Zoning office at 636-583-6369.

Sincerely,

A handwritten signature in cursive script that reads "Scottie C. Eagan". The signature is written in black ink and is positioned above the typed name.

Mrs. Scottie C. Eagan
Planning Director

Cc: Kenneth Liss - Andrews Engineering
Joe Feldman, P.E., Franklin County Engineer
Craig Ceismann - Ameren Missouri
Mark Vincent, Franklin County Counselor

FRANKLIN COUNTY

PLANNING & ZONING DEPARTMENT
PUBLIC WORKS DIVISION



400 EAST LOCUST STREET
ROOM 003B
UNION, MO 63084
MAIN LINE (636) 583-6369
FAX (636) 583-7911
www.franklinmo.org

December 10, 2013

Missouri Department of Natural Resources
ATTN: Charlene S. Fitch, P.E.
P.O. Box 176
Jefferson City, MO 65102

Re: Ameren Missouri ("Applicant") Construction Permit Application to the Missouri Department of Natural Resources ("MDNR"), originally deemed complete on February 7, 2013, and amended by letter dated August 7, 2013 and enclosures therewith (as amended at any time to date, the "Application") for a Proposed Utility Waste Landfill ("Proposed UWL")

Dear Ms. Fitch:

This letter supplements our letters to you of September 18, 2013 and October 10, 2013. As you have expressed an interest in being apprised of the status of the review of the Application by the County's Independent Registered Professional Engineer ("IRPE"), we are providing the following report.

In our letter of October 10, 2013, we advised you that by letter dated October 9, 2013, the Applicant had committed to install two additional groundwater monitoring wells. Since that time, the Applicant has submitted updated plans for location of additional wells, together with detailed responses to the October 8, 2013 comments of the IRPE.

The Applicant and the IRPE met at County offices on November 12, 2013, and since that time on a number of occasions discussed the IRPE's comments and the Applicant's responses thereto. The IRPE has also reviewed the Applicant's proposed amendments to the Application, which amendments we understand are to be filed with your office shortly.

We are happy to report that all of the IRPE's comments have been fully addressed by the Applicant, and both the Applicant and the IRPE (and the County) are in agreement with the resolution of those comments provide in the memorandum attached hereto.

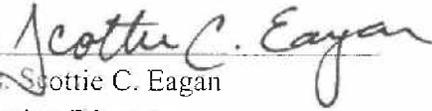
We are enclosing the original IRPE's letter dated December 4, 2013, confirming the foregoing.

Except as clarified hereby, we confirm and restate our September 18, 2013 and October 10, 2013 letters.

If you have any questions regarding this letter, please contact the Planning and Zoning office at 636-583-6369.

Sincerely,

Franklin County Missouri

By: 
Mrs. Scottie C. Eagan

Planning Director

Cc: Kenneth Liss – Andrews Engineering
Joe Feldmann, P.E., Franklin County Environmental Resource Officer
Craig Geismann – Ameren Missouri
Mark Vincent, Franklin County Counselor

Joe Feldmann

From: Mark Vincent <marksvincent13@gmail.com>
Sent: Thursday, October 10, 2013 1:20 PM
To: Scottie Egan; Joe Feldmann
Subject: Fwd: Supplement to Zoning Letter [IWOV-idocs.FID75716]
Attachments: Zoning Estoppel Letter--County_s Oct. 10 Supplement (2).DOC

Scottie;

Please print out, sign and FAX and mail it to MoDNR today. Joe can advise you as to where to send it.

----- Forwarded message -----

From: Timothy Tryniecki <ttryniecki@armstrongteasdale.com>
Date: Thu, Oct 10, 2013 at 1:17 PM
Subject: Supplement to Zoning Letter [IWOV-idocs.FID75716]
To: "Mark Vincent (marksvincent13@gmail.com)" <marksvincent13@gmail.com>

Mr. Vincent,

Attached on behalf of Ameren Missouri is a proposed amendment to the County's zoning certification letter of September 18, 2013. If this is acceptable to the County, we ask that the County issue the letter to MDNR this afternoon.

Thank you.



Armstrong Teasdale LLP
Timothy J. Tryniecki | Partner
7700 Forsyth Blvd., Suite 1800, St. Louis, Missouri 63105-1847
DIRECT: (314) 342-8027 | FAX: (314) 612-2296 | MAIN OFFICE: 314.621.5070 | CELL: (314) 780-2088
ttryniecki@armstrongteasdale.com
www.armstrongteasdale.com

*****PRIVATE AND CONFIDENTIAL*****

This transmission and any attached files are privileged, confidential or otherwise the exclusive property of the intended recipient or Armstrong Teasdale LLP. If you are not the intended recipient, any disclosure, copying, distribution or use of any of the information contained in or attached to this transmission is strictly prohibited. If you have received this transmission in error, please contact us immediately by e-mail (admin@armstrongteasdale.com) or telephone (314-621-5070) and promptly destroy the original transmission and its attachments. Opinions, conclusions and other information in this message that do not relate to the official business of Armstrong Teasdale LLP shall be understood as neither given nor endorsed by it.

[Letterhead of Franklin County, Missouri]

October __, 2013

By Electronic Mail to charlene.fitch @dnr.mo.gov
and by Certified Mail No. _____
(return receipt requested)

Missouri Department of Natural Resources
P.O. Box 176
Jefferson City, Missouri 65102-0176

Attention: Charlene S. Fitch, P.E.,
Chief, Engineering Section

Re: Ameren Missouri (the "Applicant") Construction Permit Application to the Missouri Department of Natural Resources ("MDNR") originally deemed complete on February 7, 2013, and Amended by Letter Dated August 7, 2013, and enclosures therewith (as amended at any time, the "Application") for a Proposed Utility Waste Landfill ("Proposed UWL")
-- Ameren Missouri Labadie Energy Center,
Franklin County, Missouri

Dear Ms. Fitch:

Thank you for your letter of October 2, 2013, asking for clarification of our letter of September 18, 2013. We offer the following clarifications to your numbered questions:

1. We believe you have received directly from the County's Independent Registered Professional Engineer ("IRPE"), by e-mail of September 27, 2013, a copy of a clarification letter from the IRPE to the County. Since that date we have held discussions with the IRPE and received written revisions to its original comments. The IRPE has now completed its review of the Ameren Application (to MDNR). The IRPE comments (including the points in its September 27, 2013 letter) have been addressed by the Applicant to the satisfaction of the County, and we can certify that review and comment by the IRPE is complete in accordance with the Landfill Ordinance. Specifically, by letter dated October 9, 2013, the Applicant has committed to install two additional groundwater monitoring wells, one of 80-100 feet in depth.
2. Contrary to any implication in our September 18, 2013 letter, notably paragraphs 3 and 5 thereof, the County does not issue a construction permit under its Landfill Ordinance. We apologize for any confusion. The Landfill Ordinance does require an operating license after completion of construction, but this requirement only applies prior to commencement of

operations. There are no outstanding or required County permit applications for the Proposed UWL.

Except as clarified hereby, we confirm our September 18, 2013 letter.

Please let us know if you have any further comments or questions.

Sincerely,

Franklin County, Missouri

By: _____
Printed Name: _____
Title: _____

cc: Joe Feldmann, P.E., Franklin County Engineer
Mark S. Vincent, Franklin County Counselor

Craig J. Geismann, P.E., P.M.P.,
Managing Supervisor, Hydro Engineering
Union Electric Company,
d/b/a Ameren Missouri
1901 Chouteau
St. Louis, MO 63103

Appendix Z

Groundwater Demonstration

REPORT
2008012455

**AMEREN MISSOURI LABADIE ENERGY CENTER
UTILITY WASTE LANDFILL (UWL)
SOLID WASTE DISPOSAL AREA
FRANKLIN COUNTY, MISSOURI**

**APPENDIX Z
DEMONSTRATION: BASE OF UTILITY WASTE LANDFILL LINER
IN INTERMITTENT CONTACT WITH GROUND WATER**

Prepared for



Prepared by



November 2012



The Professional whose signature and personal seal appear hereon assumes responsibility only for what appears in the attached report and disclaims (pursuant to Section 327.411 RSMo) any responsibility for all other plans, estimates, specifications, reports, or other documents or instruments not sealed by the undersigned Professional relating to or intended to be used for any part or parts of the project to which this report refers.

**APPENDIX Z
DEMONSTRATION: BASE OF UTILITY WASTE LANDFILL LINER
IN INTERMITTENT CONTACT WITH GROUND WATER**

TABLE OF CONTENTS

<u>Section</u>	<u>Page</u>
1.0 INTRODUCTION	1
1.1 Brief Project Description	2
2.0 TECHNICAL BASIS.....	3
2.1 Requirements of Compacted Clay Liner.....	3
2.2 Definition of Natural Ground Water Table at Labadie UWL Site.....	4
2.3 Potential Technical Impacts of a High Ground Water Table.....	6
2.3.1 Potential Swelling	6
2.3.2 Hydrostatic Uplift	7
2.3.3 Loss of Shear Strength	7
2.3.4 Stability of Slopes	7
2.3.5 Constructability of Clay Liner in a High Ground Water Table	7
2.3.6 Long-term Performance of Composite Liner System	8
3.0 ENVIRONMENTAL PROTECTION OF A UTILITY WASTE LANDFILL	8
3.1 Ground Water Quality Protection	8
3.2 Surface Water Quality Protection	9
4.0 DEMONSTRATION OF COMPLIANCE WITH 10 CSR 80-11.010.....	9
4.1 Design/Operational Considerations Relative to Unique Labadie UWL Site Conditions	9
4.1.1 Intermittent Ground Water Contact with Landfill Liner.....	10
4.1.2 Impact of DSI Results on Liner and Leachate Collection System Design	11
4.1.3 Landfill Liner Separation from Ground Water	13
4.1.4 Design and Operation of Liner System.....	13
4.2 Impact on the Construction Permit Application	15
5.0 REFERENCES	15

DEMONSTRATION: BASE OF A UTILITY WASTE LANDFILL LINER IN INTERMITTENT CONTACT WITH GROUND WATER

1.0 INTRODUCTION

The Missouri Solid Waste Management Rules for utility waste disposal (reference Chapter 11, Utility Waste Landfill) were effective on July 30, 1997, in response to statutory changes to the Missouri Solid Waste Management Law. The statutory changes were intended to distinguish the physical and chemical characteristics of utility waste from the sanitary and demolition wastes that were the focus of the original solid waste management Rules (reference Chapter 3, Sanitary Landfill, and Chapter 4, Demolition Landfill), as well as to address other unique issues of the electric power generation industry. Chapter 11 is patterned after Chapter 3 and Chapter 4, which were originally created in 1973 in response to the new Missouri Solid Waste Management Law.

10 CSR 80-11.010(1) General Provisions, states the overall intent of the rule, stating in part:

This rule is intended to provide for utility waste landfill operations that will have minimal impact on the environment. The rule sets forth requirements and the method of satisfactory compliance to ensure that the design, construction and operation of utility waste landfills will protect the public health, prevent nuisances and meet applicable environmental standards. The requirement subsections contained in this rule delineate minimum levels of performance required of any utility waste landfill operation. The satisfactory compliance subsections are presented as the authorized methods by which the objectives of the requirements can be realized. The satisfactory compliance subsections are based on the practice of landfilling utility waste. If techniques other than those listed as satisfactory compliance in design or operation are used, it is the obligation of the utility waste landfill owner/operator to demonstrate to the department in advance that the techniques to be employed will satisfy the requirements. Procedures for the techniques shall be submitted to the department in writing and approved by the department in writing prior to being employed. [emphasis added]

Ameren Missouri recognizes that, if they choose to "...utilize techniques other than those listed as satisfactory compliance in the design and operation..." of the utility waste landfill, they must "...demonstrate to the department in advance that the techniques to be employed will satisfy the requirements..."

The Missouri Department of Natural Resources' rules for utility waste landfills (UWL) stipulate in 10 CSR 80-11.010(4)(B)6 that:

If the base of the landfill liner will be in contact with ground water, the applicant shall demonstrate to the department's satisfaction that the ground water will not adversely impact the liner.

In addition, 10 CSR 80-11.010(8)(B)1.C requires that the plans shall include:

Ground water elevation and proposed separation between the lowest point of the lowest cell and the predicted maximum water table elevation;

The lowest point of the base of the clay liner for the cells will be at el. 466, which is 2 feet above the “natural water table” as defined in the following section. The bottom of the clay liner in the lowest sumps will probably be in intermittent contact with the ground water. In accordance with 10 CSR 80-11.010(1), this document has been prepared to demonstrate that the ground water intermittent contact will not adversely impact the compacted clay liner in the sumps, per 10 CSR 80-11.010(4)(B)6, based upon the interpretation that this regulation is applicable to the sumps because they are integral with the cells.

It is the objective of this report to provide the technical and regulatory basis for:

- demonstrating the impacts of an intermittent high ground water table on the composite bottom liner (specifically the bottom compacted clay liner and the HDPE membrane liner on top of the compacted clay liner) are negligible;
- evaluating the environmental impact of this site condition on the projected use of the UWL; and
- demonstrating that the characteristics of the compacted clay liner and the proper design of the UWL will continue to function as designed in compliance with the intent of the 10 CSR 80-11.010 to minimize environmental hazards and comply with applicable ground water and surface water quality standards and requirements throughout the life and post-closure of the UWL.

Section 2.0 of this report provides a summary discussion of the technical basis of the structural and hydraulic engineering properties of compacted clay liners (CCLs) and the potential impact to CCLs from intermittent contact with ground water in the protection of surface water and ground water quality. Section 3.0 provides an overview of the impact to the environmental protections provided to surface water and ground water by the utility waste landfill’s CCL under intermittent contact with the unconfined ground water. Finally, Section 4.0 identifies the specific requirements of 10 CSR 80-11.010 that potentially require demonstration of satisfactory compliance with the requirements of the Utility Waste Landfill design and operational standards.

1.1 Brief Project Description

The Labadie UWL will be developed on property contiguous with the boundary of property upon which the Labadie Energy Center is situated, on the right descending (south) overbank area of the Missouri River between River Miles 56.88 and 57.38. The existing ground surface ranges from about el. 471 to el. 465¹ below the current footprint of the UWL. The areas of lower ground surface elevations (below about el. 464) located in the southeast region of the site have been excluded from the proposed developed area of the UWL.

The proposed UWL is located in the alluvial deposits adjacent to the Missouri River. As demonstrated in the Detailed Site Investigation (DSI) for this project² the ground water levels are strongly influenced by

¹ Elevations herein refer to the North American Vertical Datum of 1988 (NAVD88) which is the datum used in FEMA’s new Flood Insurance Rate Maps (FIRM). NAVD88 corrects many of the problems with the earlier NGVD of 1929.

² *Detailed Site Investigation Report for Ameren Missouri Labadie Power Plant Proposed Utility Waste Disposal Area, Franklin County, Missouri*, dated February 4, 2011, revised March 30, 2011. Approved by Missouri Department of Natural Resources, Division of Geology and Land Survey on April 8, 2011.

the Missouri River (see Appendix W or page 39 of DSI Report). Because the Missouri River is an “open river,” that is not controlled by a dam in the vicinity of the Labadie Energy Center, the level of the Missouri River and hence the natural water table at the site are constantly changing. Therefore, the Natural Water Table is never under static hydrologic conditions.

The UWL site is currently protected from regular Missouri River flooding by the Labadie Bottom Levee District agricultural levee with heights at or near the 100-year flood elevation. In the unlikely event that the agricultural levee is overtopped or breached, the UWL site is further protected from direct Missouri River flood currents by the Labadie Energy Center itself which is upstream and higher than the 500-year flood elevation, creating a low velocity shadow, or ineffective flow area, over the entire UWL site. The regulatory 100-year base flood elevation (BFE) of 483.98 at the upstream end of the UWL site became effective on October 18, 2011. The 500-year flood elevation at this river station is reported by FEMA to be 487.55. By comparison, the flood crest at this location in August 1993 was about el. 483.6.

The Labadie UWL will be divided into four distinct internal drainage zones or cells. The lowest point of each drainage area is designed to be el. 468 (top of composite liner), while the highest point of each cell bottom will be el. 474 to 476 (top of composite liner). The majority of the UWL bottom is designed to have a minimum 1% slope and will have a “blanket drain” as a part of the leachate collection system. In addition to the blanket drain, each cell will have a 6-inch diameter collection pipe running generally perpendicular to the outside edge of the landfill at an approximate 0.5% slope.

Each collection pipe will discharge into a small leachate sump (approximate size 15 feet by 20 feet). The bottom of the composite clay liner in the sumps is designed to be at el. 463.0. With settlement, the bottom of the clay of the composite liner in the sumps is estimated to be at el. 462.2. The 15 sumps represent less than 0.15% of the entire UWL acreage. Additionally, the sumps will be gravel filled and are expected to have one to three feet of water in them under normal operating conditions.

2.0 TECHNICAL BASIS

In the 1980’s through the mid-1990’s, compacted clay liners and composite liners were the subject of significant research and technical discussion due to increasing regulatory requirements on industrial and municipal landfills. The base of knowledge regarding compacted clay liner was established on a national level and the technical requirements were widely adopted as ‘state of the art’ Missouri’s current utility waste landfill requirements were adopted in the mid-1990’s and closely follow the prevailing technical basis for compacted clay liners. The Labadie UWL utilizes a two-foot thick composite liner system (compacted clay liner overlain by a flexible membrane liner). An intermittent high ground water table will first come in contact with the bottom of the compacted clay liner in the sumps. Therefore, the focus of the technical discussion is on the lower compacted clay liner, not the upper flexible membrane liner.

2.1 Requirements of Compacted Clay Liner

The compacted clay liner must have the following characteristics (10 CSR 80-11.010(6)(B)):

- 1) For a composite liner, includes a lower component that consists of at least a 2-foot layer of compacted soil with a hydraulic conductivity (k) of no more than 1×10^{-5} cm/sec., and compacted to 95% of standard Proctor (ASTM D699) maximum dry unit weight ($\gamma_{d,max}$)

with the moisture content at the time of compaction between optimum moisture content (w_{opt}) and 4% above w_{opt} , or within other ranges of density and moisture such that are shown to provide for the liner to have a $k \leq 1 \times 10^{-5}$ cm/sec.

- 2) The soils used for the compacted clay liner shall have the following minimum specifications:
 - A. Be classified as low plastic clay (CL), high plastic clay (CH) or sandy clay (SC).
 - B. Have more than 30% particle sizes by weight passing U.S. #200 sieve (0.075mm).
 - C. Have an Atterberg liquid limit (LL) $\geq 20\%$
 - D. Have an Atterberg plasticity index (PI) $\geq 10\%$.

Daniel and Koerner (1993) reported that the degree of saturation of clay liners placed with this criteria ranges from 71% to 98%, and averages 85%. That is, the voids in the soil matrix may still contain some air as well as water. The technical questions in regard to the clay liner are: 1) If the GWT is above the bottom liner for a long enough time, could the compacted clay liner become saturated; and 2) what are the potential ramifications of the compacted clay liner becoming saturated? Frank et al (2005) reported that a compacted clay liner which had been under 0.31m of water for 14 years did not become fully saturated. The report theorized that this is due to the very high capillary stresses in the matrix of the compacted clay which could not be overcome by high external hydrostatic pressure. Therefore, the internal shear strength and hydraulic properties of the compacted clay liner were not affected.

The proposed design of the cells for the Labadie UWL will use a clay liner with a maximum hydraulic conductivity of 1×10^{-7} cm/sec, which provides an additional factor of safety that the hydraulic conductivity will not exceed the required maximum even if changes to the clay liner should occur. This report will demonstrate that the initial permeability of the clay liner, even at the more stringent than required 1×10^{-7} cm/sec permeability, will not be impacted by intermittent contact with groundwater.

2.2 Definition of Natural Ground Water Table at Labadie UWL Site

This section was submitted to the Missouri Department of Natural Resources and Franklin County as a separate report titled "Design Basis for Ground Water Level," dated April 9, 2012, to present a rational definition of the "Natural Water Table" as it applies to this site, as a basis for the design of the Labadie UWL.

The daily average levels of the Missouri River at the Labadie Energy Center from December 3, 1999, through November 9, 2010, were used in the analyses of the hydrogeology of the site for the DSI because these are the only Missouri River readings close to the site. The 3973 readings are plotted in Figure 32 (attached) from the DSI Report. The graph of the data demonstrates the highly variable nature of the Missouri River level at the site. The highest level in the data is el. 475.4 which occurred on September 16, 2008. The lowest statistically significant level in the data with multiple occurrences is el. 445.3. Below is a table of the frequencies of the Missouri River levels in 2-foot intervals from these data:

Frequencies of Missouri River Levels at Labadie Energy Center (2000-2010)

Range	No.	%	% Greater
474-475.4	3	0.08%	
472-473	12	0.30%	0.38%
470-471	52	1.31%	1.69%
468-469	75	1.89%	3.57%
466-467	77	1.94%	5.51%
464-465	132	3.32%	8.83%
462-463	187	4.71%	13.54%
460-461	225	5.66%	19.20%
458-459	263	6.62%	25.82%
456-457	348	8.76%	34.58%
454-455	365	9.19%	43.77%
452-453	518	13.04%	56.81%
450-451	801	20.16%	76.97%
448-449	577	14.52%	91.49%
393-448	338	8.51%	100.00%

The ground water levels at the site were monitored monthly for the DSI from December 2009 through November 2010. These findings are summarized in Appendix W. The data show that the alluvial aquifer discharges toward the Missouri River during periods of relatively low flow, during which time the ground water levels below the site will be 1 to 3 feet above the Missouri River level. However, when the Missouri River is above approximate el. 461 for a sustained period, the ground water flow reverses and the ground water levels approach the level of the Missouri River near the river (in the northwest portion of the site) and about 5 feet or more below the river level over the majority of the site.

This is demonstrated in the graph of the average water table elevations versus the Missouri River elevation in Figure 1 of Appendix W. From June 5, 2010, through July 5, 2010, the Missouri River elevation at the plant was above el. 465.1, and reached a maximum of el. 471.3. During this period, the average ground water table below the site rose to el. 464, with the average ground water table approaching el. 465 in the northwest portion of the site. The level of the Missouri River at the plant also was above el. 465 between May 13 and May 30, 2010, with a maximum level of el. 472.8. During this shorter duration of sustained high river levels (18 days compared to 30 days in June and July), the average ground water table beneath the site rose from el. 462.0 to el. 463.0. It can be concluded from these data that the ground water table beneath the site will rise to about el. 464 when the Missouri River at the plant is above el. 465 for about 30 days and reaches a maximum level above el. 471 during that period. The question then becomes “How often do such sustained high Missouri River levels occur at the site?”

From the above table, the Missouri River was at or above el. 465 about 9% of the days from December 1999 through November 2010, and was at or above el. 470 about 1.7% of the days. There were 12 intervals in this decade during which the Missouri River at the plant was above el. 465 for more than 5 days and peaked above el. 470. However, the Missouri River level was above el. 465 for more than 13 days during only 5 of these 12 intervals:

Periods of Sustained High Missouri River Levels at Labadie Energy Center (2000-2010)

Period	No. Days	Maximum River Elev.
June 3 – July 8, 2008	36	471.6
June 5 – July 5, 2010	30	471.3
May 2 – May 20, 2002	19	473.2
May 13 – May 30, 2010	18	472.8
May 9 – May 21, 2007	13	471.9

As stated above, the data from the 12 months of ground water level monitoring at the site indicate that the maximum average ground water level of about el. 464 will occur when the sustained high Missouri River level at the Labadie Energy Center exceeds el. 465 for more than 18 days, and probably approaching 30 days, with a peak river level above el. 471. While the level of the Missouri River at the site has exceeded el. 470 about 1.7% of the 3973 days from December 1999 through November 2010, an interval of sustained high river levels adequate to create a high average ground water level of el. 464 has occurred only twice. **Therefore, defining el. 464 as the average “Natural Water Table” or ground water level at the site would appear to be conservative, in that it occurs for a relatively short duration only about two times in a 10-year period. This Natural Water Table elevation can also be considered the ‘average high groundwater table’ at the Labadie UWL site.**

2.3 Potential Technical Impacts of a High Ground Water Table

The potential impacts of a ground water table (GWT) that is above the bottom compacted clay liner are:

1. potential swelling of the compacted clay liner, particularly if the clay is high plastic (CH) as defined by ASTM D2487,
2. hydrostatic uplift against the bottom of the compacted clay liner,
3. potential loss of shear strength of the compacted clay liner,
4. potential decrease in the stability of exterior or interior slopes,
5. constructability of a compacted clay liner in a high ground water table, and
6. long-term performance of the composite liner system.

2.3.1 Potential Swelling

High plastic clay (i.e. “CH” with a LL above 50%) has a tendency to swell when the clay is at low moisture content. When relatively dry, expansive clay is exposed to free water, then the clay will swell if it is not confined by a large pressure. The weight of the CCP in the UWL (particularly in the sumps which are at the lowest elevations) confines the clay liner and therefore reduces this swell potential. Swelling would increase the void ratio of the clay and could result in a larger hydraulic conductivity. The clay for the liner will be imported to the site. Part of the laboratory testing to qualify the clay liner material will include grain size and Atterberg limits to determine the swell potential of the clay soils.

Composite samples of the clay liner material will be compacted in a qualified soil laboratory for hydraulic conductivity tests for the approval of the clay material. The first step in the hydraulic conductivity test is to saturate the sample at a low confining pressure (ASTM D5084). Thus, any swelling that may occur would do so in the test cell, and the hydraulic conductivity that is subsequently measured would already

be affected by any swelling. Therefore, laboratory testing on the clay liner material will take into account any swell potential.

2.3.2 Hydrostatic Uplift

Water levels approaching the 100-year flood elevation around the UWL perimeter berms will create a hydrostatic uplift pressure on the base of the composite liner. Operational procedures to counteract this potential uplift concern are discussed in Section 3.3.2.2 and Appendix J of the Construction Permit Application. Dry cells will be filled with CCPs upon completion to counter any hydrostatic uplift that might occur.

2.3.3 Loss of Shear Strength

The shear strength of a soil has 2 components: the effective cohesion (c') and the effective internal friction angle (ϕ'). Unless there is some cementation in the soil matrix, the cohesive shear strength is actually very small at very low confining pressures (Terzaghi, Peck, Mesri, 1996). Saturation of a soil will reduce its shear strength, primarily due to the loss of negative pore pressures, and the impact of the increase in pore pressure during shearing. Therefore, ϕ' is the critical shear strength property. However, the area of a sump is very small compared to the extents of the perimeter berm, so the loss of shear strength of the clay liner in the sump, if it could occur, will have an insignificant impact on the stability of the exterior slopes of the UWL. Consolidated-undrained (C-U) triaxial compression tests with pore pressure measurements will be run on representative composite clay liner samples. The first step in the C-U test is to ensure that the sample is saturated (ASTM D4767). Thus, the impact of potential saturation is already incorporated in the measurement of ϕ' . Therefore, the possible impact of saturation of the compacted clay liner, if it could occur, is not an issue because the saturated properties used in the analyses for the UWL will be verified by the laboratory testing of the clay liner material before it is approved for construction.

2.3.4 Stability of Slopes

A ground water level that is at the ground surface results in the minimum factor of safety for the global stability of any slope because of the reduction in effective confining stress in the natural soils beneath and beyond the toe of the berm. The internal stability of the waste is not affected by the external ground water level because the waste is isolated from the ground water by the liner. Some of the cases of global stability of the waste slope and perimeter berm that were analyzed used measured long-term shear strength properties (c' and ϕ') and an assumed exterior water level at ground surface. So, the issue of high ground water levels, or flooding, has been considered in the stability analyses reported in the Construction Permit Application, including under seismic load and liquefaction potential.

2.3.5 Constructability of Clay Liner in a High Ground water Table

A high ground water table could interfere with the excavation to final subgrade of the bottom liner and with the compaction of the clay liner. If this condition occurs, the subgrade will be soft and will tend to pump and rut, making it difficult to properly compact the clay liner. Once the ground water level is about 2 or 3 feet below the subgrade, then it is possible to construct the bottom liner in accordance with the project specifications. So, a high ground-water could adversely affect the construction schedule and

costs, which will be addressed at the time of construction. But the quality and performance of the properly constructed bottom liner will not be impacted for the reasons presented in the preceding sections.

2.3.6 Long-term Performance of Composite Liner System

The types of clays used in construction of the liner and the methods of construction will preclude potential negative impacts of infrequent high ground water levels on the long-term performance of the composite liner system. Also, the long-term properties which were used in the analyses for the UWL, and the various extreme conditions which were considered (i.e., flooding or earthquake) take into consideration extreme adverse conditions which may occur during the operating life and post closure performance. Only one potential impact of an intermittent, high GWT on the bottom liner in the sumps could not be mitigated by the design and construction of the UWL – the hydrostatic uplift pressure. Therefore, this impact will be addressed through operational requirements of the UWL.

3.0 ENVIRONMENTAL PROTECTION OF A UTILITY WASTE LANDFILL

As stated in 10 CSR 80-11.010 (1) General Provisions, “The rule sets forth requirements and the method of satisfactory compliance to ensure that the design, construction and operation of utility waste landfills will protect the public health, prevent nuisances and meet applicable environmental standards...”. The individual subsections 10 CSR 80-11.010 imply that the Missouri Solid Waste Management Law and Rules, as they relate to utility waste, are promulgated primarily to prevent the construction and operation of solid waste disposal areas from negatively impacting the surface waters, ground water and air, in particular, typically monitored within a specific zone of impact surrounding the solid waste disposal area. The following sections discuss the environmental protections provided by the Labadie UWL design and operation. The focus of this section is on the protection of ground water quality and surface water quality, because the performance of the CCL does not have a direct impact on air quality.

3.1 Ground Water Quality Protection

Protection of ground water quality is a primary objective of regulatory design and operating requirements for utility waste disposal areas. Liners, leachate collection systems, and final cover systems all focus on: keeping the waste materials relatively dry; minimizing the quantity of leachate formed by the disposal area; containing the leachate within the disposal area; and collecting and removing the leachate from the disposal area for further treatment and ultimate disposal outside of the disposal area environment. With regard to ground water in intermittent contact with the utility waste landfill liner, the critical issues are: the continued structural integrity of the liner, both as the base of the landfill and as a component of the composite liner; and the hydraulic performance of the CCL component of the composite liner to serve its intended function of containing the leachate within the disposal area. The discussion of specific, potential technical impacts to the landfill design in Section 2.0 demonstrate that the structural integrity and the hydraulic performance of the CCL component are not impacted by ground water in intermittent contact with the utility waste landfill liner. Therefore, the CCL component’s functions of providing a structural base for the landfill and of containing leachate within the disposal area are not diminished.

3.2 Surface Water Quality Protection

Regarding ground water in intermittent contact with the utility waste landfill liner, the continued structural integrity and hydraulic performance of the CCL component of the composite liner to serve its intended function of containing the leachate within the disposal area indirectly relates to the protection of surface water quality at the Labadie UWL. The design and construction of berms around the perimeter of each disposal cell to prevent inundation of the utility waste during future Missouri River flood events are the primary design protection of surface water quality at the Labadie UWL. The proposed operational plan to contain all stormwater runoff generated inside of the perimeter berms provides the primary operational protection of surface water quality. The design and operation of the primary stormwater management systems are not directly impacted by ground water in intermittent contact with the utility waste landfill liner.

4.0 DEMONSTRATION OF COMPLIANCE WITH 10 CSR 80-11.010

The ‘dry tomb’ landfill concept seeks to avoid permanent placement of waste below the natural ground water table, in part, to avoid a direct connection to ground water through a liner leak and to avoid the long-term infiltration of ground water into the landfill that would require additional post closure care in the form of increased leachate removal and disposal. The design of the Labadie UWL does not propose to permanently place waste below the ground water table. This statement is supported by the original Detailed Site Investigation for the UWL. In addition, the technical discussions in Section 2.0 of this report support Ameren Missouri’s position that the intermittent contact of the CCL with ground water does not impact the ability of the CCL to satisfactorily meet the requirements of 10 CSR 80-11.010 (Chapter 11, Utility Waste Landfill). This results in Ameren Missouri proposing the use of techniques other than those listed in 10 CSR 80-11.010 as satisfactory compliance in the design and operation of the utility waste disposal area. As previously stated, this report provides a demonstration to the Missouri Department of Natural Resources Solid Waste Management Program that the site conditions at the Labadie UWL, coupled with the engineering design and operational details, are acceptable from both a technical and regulatory perspective.

The rule format for Chapter 11 generally includes one section for each specific topic, each followed by three subsections [(A) Requirement; (B) Satisfactory Compliance – Design; and (C) Satisfactory Compliance – Operations]. Section 4.1 identifies the design and/or operational methods proposed for the Labadie UWL that require demonstration that the overall requirements of Chapter 11, Utility Waste Landfill, are met for the site conditions and design of the Labadie UWL.

4.1 Design/Operational Considerations Relative to Unique Labadie UWL Site Conditions

The following sections of the Missouri Solid Waste Management Rules have been identified for specific summary discussion as a conclusion to the demonstration that the Labadie UWL meets the minimum requirements of the Missouri Solid Waste Management Rules. The design and/or operational issues identified are listed below, followed by the regulatory REQUIREMENT [emphasis added] as identified in the appropriate rule section or subsections and the specific design and/or operational methods specified by Chapter 11. Finally, reference is made to the specific technical issues provided in Section 2.0 that support

the proposed deviation from the specified design and/or operational method. In review, the critical points of Section 2.0 are summarized below:

- Studies have shown that clay liners do not become saturated even when continuously submerged for years due to the very high internal capillary stresses. Therefore the internal properties of the clay liner are unlikely to be affected by intermittent contact with ground water;
- The compacted clay liner for the Labadie UWL is designed to have a maximum hydraulic conductivity of 1×10^{-7} cm/sec, which provides an added safety factor that the maximum hydraulic conductivity of 1×10^{-5} cm/sec required by regulation will not be exceeded. Furthermore, the initial installed hydraulic conductivity of the CCL will not be impacted by intermittent contact with groundwater;
- The laboratory measurement of hydraulic conductivity of the clay liner allows for any potential swelling at low confining pressures;
- The remote threat of adverse hydrostatic uplift will be addressed through operational procedures of the UWL;
- The minimum internal and interface shear strength properties assumed for the compacted clay liner for the design of the UWL will be specified (see Appendix J) and verified for the offsite clay liner material; and
- The structural stability analyses of the perimeter berms and exterior slopes of the UWL considered the worst-case condition of a ground water table at the ground surface. Therefore, this condition is considered in the current design.

4.1.1 INTERMITTENT GROUND WATER CONTACT WITH LANDFILL LINER.

Regulatory Citation and Requirement:

10 CSR 80-11.010(4) Site Selection.

(A) Requirement. Site selection and utilization shall include a study and evaluation of geologic and hydrologic conditions and soils at the proposed utility waste landfill and an evaluation of the environmental effect upon the projected use of the completed utility waste landfill. Applications for utility waste landfill construction permits received on or after the effective date of this rule shall document compliance with all applicable siting restriction requirements contained in paragraphs (4)(B)1. through 5. of this rule.

Regulatory Design and/or Operational Techniques:

(B)6. If the base of the landfill liner will be in contact with ground water, the applicant shall demonstrate to the department's satisfaction that the ground water will not adversely impact the liner.

(B)7. Owners/operators of proposed utility waste landfills shall demonstrate how adverse geologic and hydrologic conditions may be altered or compensated for via surface water drainage diversion, underdrains, sumps, and other structural components. All alterations of the site shall be detailed in the plans. Precipitation, evapotranspiration and climatological conditions shall be considered in site selection and design.

(B)8. The results of the detailed site investigation report will be the basis to determine if a secondary liner, such as a geomembrane, or a leachate collection system is mandatory to ensure that there is no environmental impact from the landfill. Owner/operators of proposed utility waste landfills shall make a demonstration based on the following:

- A. An evaluation of the physical and/or chemical characteristics of the waste; and*
- B. Documentation through modeling, testing, or other research data proving that the quality of ground water underlying the proposed site will not be affected and that there is no potential for migration of fluids from the utility waste landfill.*

Discussion of Alternative Design:

This report provides specific discussion of technical information indirectly required by this regulation relative to the intermittent contact of the CCL component of the composite liner. As outlined in the details of Section 2.0, the design of the utility waste landfill for the Labadie Energy Center anticipates the potential for saturated clays and saturated insitu base conditions, as well as the potential impact of high ground water table conditions intermittently caused by fluctuating Missouri River levels. No additional design alternatives or changes are considered necessary, as supported by the information in the report.

Compliance with Regulatory Requirement:

The CPA for the Labadie UWL addresses the site selection and utilization requirements, including a study and evaluation of geologic and hydrologic conditions and soils at the proposed utility waste landfill and an evaluation of the environmental effect upon the projected use of the completed utility waste landfill. The technical discussion in Section 2.0 provides additional “demonstration” relative to the site-specific design with regard to the intermittent contact of the CCL component of the composite liner.

Based on the conclusions of this report, no additional design or operational changes are necessary to demonstrate that the geologic and hydrologic conditions referenced in 10 CSR 80-11.010(4), Site Selection, (specifically, the intermittent contact of small portions of the bottom of the landfill liner) are necessary to demonstrate that the quality of ground water underlying the proposed site will not be affected and that there is no increased potential for migration of fluids from the Labadie UWL. The liner and leachate collection requirements are further discussed in previous and subsequent portions of this report.

4.1.2. IMPACT OF DSI RESULTS ON LINER AND LEACHATE COLLECTION SYSTEM DESIGN.

Regulatory Citation and Requirement:

10 CSR 80-11.010(5) Design

(A) Requirement. Plans, addendums, as-built drawings, or other documents which describe the design, construction, operation, or closure of a utility waste landfill or which request an operating permit modification for the utility waste landfill shall be prepared or approved by a professional

engineer. These documents shall be stamped or sealed by the professional engineer and submitted to the department for review and approval.

Regulatory Design Requirements:

(A)3. Owners/operators of utility waste landfills shall demonstrate how adverse geologic and hydrologic conditions may be altered or compensated for via surface water drainage diversion, underdrains, sumps, and other structural components. All alterations of the site shall be detailed in the plans.

A. Precipitation, evapotranspiration and climatological conditions shall be considered in site selection and design.

B. Engineering plans and specifications that have computer model attached to them shall list the limitations and assumptions of each model used in the application.

(A)4. Plans for stability analyses for all stages of construction shall include:

A. Settlement and bearing capacity analyses shall be performed on the in-place foundation material beneath the disposal area. The effect of foundation material settlement on the liner and leachate collection shall be evaluated;

B. Stability analyses shall be performed on all liner and leachate system components;

C. Leachate collection pipe material and drainage media shall be analyzed to demonstrate that these components possess structural strength to support maximum loads imposed by overlying waste materials and equipment;

D. Waste mass stability analyses shall be performed on the disposal area at final waste grade conditions and at intermediate slope conditions; and

E. Stability analyses shall be performed on all final cover system components, including an evaluation of the effect of waste settlement on the final cover system components, side slope liner system components, surface water management system components and gas migration system components.

Discussion of Alternative Design:

The Detailed Site Investigation (DSI) required by 10 CSR 80-2.015 addressed the precipitation, evapotranspiration and climatological conditions considered in original site selection and design. This included ground water table elevations and the relationship of the Missouri River levels to the ground water table. This report provides additional technical discussion of this information. In addition, the models and calculations submitted with the CPA address all stages of construction and operation of the Labadie UWL.

This report provides additional technical discussion relative to the intermittent contact of the CCL component of the composite liner. As outlined in detail in Section 2.0, the proposed design and operation of the utility waste landfill for the Labadie Energy Center anticipates the potential for

saturated clays and saturated insitu base conditions, as well as the potential impact of high ground water table conditions intermittently caused by fluctuating Missouri River levels. No additional design alternatives or changes are believed necessary to address 10 CSR 80-11.010 (5).

Compliance with Regulatory Requirement:

In compliance with 10 CSR 80-11.010 (5), Design, this demonstration report has been prepared by professional engineers, has been reviewed and approved by a professional engineer and bears the signature and seal of the principal design engineer.

4.1.3. LANDFILL LINER SEPARATION FROM GROUND WATER.

Regulatory Citation and Requirement:

10 CSR 80-11.010(8) Water Quality.

(A) Requirement. The location, design, construction and operation of the utility waste landfill shall minimize environmental hazards and shall conform to applicable ground and surface water quality standards and requirements. Applicable standards are federal, state or local standards and requirements that are legally enforceable.

Regulatory Design Requirements:

(B)1. Plans shall include

C. Ground water elevation and proposed separation between the lowest point of the lowest cell and the predicted maximum water table elevation;

Discussion of Alternative Design:

This report provides information relative to the proposed separation between the lowest point of the lowest cell and the predicted normal water table elevation. In addition, it further evaluates the potential impact of the intermittent contact of the CCL component of the composite liner. No additional design alternatives or changes are believed necessary to address 10 CSR 80-11.010 (8).

Compliance with Regulatory Requirement:

The content of this demonstration report support the conclusion that the regulatory requirement is met. The proposed design, construction and operation of the utility waste landfill shall minimize environmental hazards and shall conform to applicable ground and surface water quality standards and requirements.

4.1.4. DESIGN AND OPERATION OF LINER SYSTEM.

Regulatory Citation and Requirement:

10 CSR 80-11.010(10) Liner Systems.

(A) Requirement. A liner shall be placed on all surfaces to minimize the migration of leachate from the utility waste landfill.

Regulatory Design Requirements:

(B)1. For a composite liner a lower component that consists of at least a two-foot (2') layer of compacted soil with a hydraulic conductivity of no more than 1×10^{-5} cm/sec. A compacted soil liner at a minimum shall be constructed of six to eight-inch (6-8") lifts, compacted to ninety-five percent (95%) of standard Proctor density with the moisture content between optimum moisture content and four percent (4%) above the optimum moisture content, or within other ranges of density and moisture such that are shown to provide for the liner to have a hydraulic conductivity no more than 1×10^{-5} cm/sec. For a single compacted clay liner a component that consists of at least a two-foot (2') layer of compacted soil with a hydraulic conductivity of no more than 1×10^{-7} cm/sec. A compacted soil liner at a minimum shall be constructed of six to eight-inch (6-8") lifts, compacted to ninety-five percent (95%) of standard Proctor density with the moisture content between optimum moisture content and four percent (4%) above the optimum moisture content, or within other ranges of density and moisture such that are shown to provide for the liner to have a hydraulic conductivity of no more than 1×10^{-7} cm/sec. The design shall include a detailed explanation of the construction techniques and equipment necessary to achieve ninety-five percent (95%) of the standard Proctor density under field conditions. The design also shall include QA/QC procedures to be followed during construction of the liner. The composite liner and the compacted clay liner shall be protected from the adverse effects of desiccation or freeze/thaw cycles after construction, but prior to placement of waste. Traffic shall be routed so as to minimize the detrimental impact on the constructed liner prior to placement of waste. The soils used for this purpose shall meet the following minimum specifications:

- A. Be classified under the Unified Soil Classification Systems as CL, CH, or SC (ASTM Test D2487-85);*
- B. Allow more than thirty percent (30%) passage through a No. 200 sieve (ASTM Test D1140);*
- C. Have a liquid limit equal to or greater than twenty (20) (ASTM Test D4318-84);*
- D. Have a plasticity index equal to or greater than ten (10) (ASTM Test D4318-84); and*
- E. Have a coefficient of permeability equal to or less than 1×10^{-7} cm/sec for the compacted clay liner and 1×10^{-5} cm/sec for the composite liner when compacted to ninety-five percent (95%) of standard Proctor density with the moisture content between optimum moisture content and four percent (4%) above the optimum moisture content, when tested by using a flexible wall permeameter (ASTM D-5084) or other procedures approved by the department;*

Alternative Design:

The proposed utility waste disposal area will utilize a composite liner that will consist of a 60-mil HDPE geomembrane liner underlain by two feet of compacted clay liner with a hydraulic conductivity equal to or less than 1×10^{-7} cm/sec. This proposed design significantly exceeded the performance of the minimum design standards and performance of the two liner options

prescribed in 10 CSR 80-11.010 (10). Ameren Missouri proactively chose this design to minimize the migration of leachate from the utility waste disposal area and to provide a UWL that will address anticipated future regulatory revisions.

Compliance with Regulatory Requirement:

The regulatory requirement is met and exceeded by the Labadie UWL proposed composite liner design. This report demonstrates that the intermittent contact of ground water with the CCL component of the composite liner will not impact the CCL's design, function or performance.

4.2 Impact on the Construction Permit Application

Following the review and acceptance of this demonstration by MDNR, this demonstration will be incorporated into the approved engineering report and plans required to be maintained throughout the operating life and post closure care as required by the Solid Waste Disposal Area Operating Permit.

5.0 REFERENCES

ASTM D4767, "Standard Test Method for Consolidated Undrained Triaxial Compression Test for Cohesive Soils."

ASTM D5084, "Standard Test Methods for Measurement of Hydraulic Conductivity of Saturated Porous Materials Using a Flexible Wall Permeameter."

Daniel, David E. and Robert M. Koerner (1993) Quality Assurance and Quality Control for Waste Containment Facilities, EPA/600/R-93/182.

Detailed Site Investigation Report for Ameren Missouri Labadie Power Plant Proposed Utility Waste Disposal Area, Franklin County, Missouri, dated February 4, 2011, revised March 30, 2011. Approved by Missouri Department of Natural Resources, Division of Geology and Land Survey on April 8, 2011.

Reitz & Jens, Inc. (2012) "Design Basis for Ground Water Level, Ameren Missouri Labadie Power Station Utility Waste Landfill," prepared for Ameren Missouri in compliance with Franklin County's amended Unified Land Use Regulations, Article 10, Section 238.

Timothy E. Frank, Ivan G. Krapac, Timothy D. Stark and Geoffrey D. Strack (2005), "Long-Term Behavior of Water Content and Density in an Earthen Liner," Journal of Geotechnical and Geoenvironmental Engineering, ASCE, Vol. 131, No. 6, June.

Mitchell, James K. (1976). Fundamentals of Soil Behavior. John Wiley & Sons, New York, 386 p.

MDNR and Stark, Timothy D. (1997). Draft Technical Guidance Document on Static and Seismic Slope Stability for Solid Waste Containment Facilities. Solid Waste Management Program, Division of Environmental Quality, Missouri Department of Natural Resources, Jefferson City, MO, 96 p.

Demonstration: Base of UWL Liner in Intermittent Contact with Ground Water
Ameren Missouri Labadie Energy Center UWL Solid Waste Disposal Area

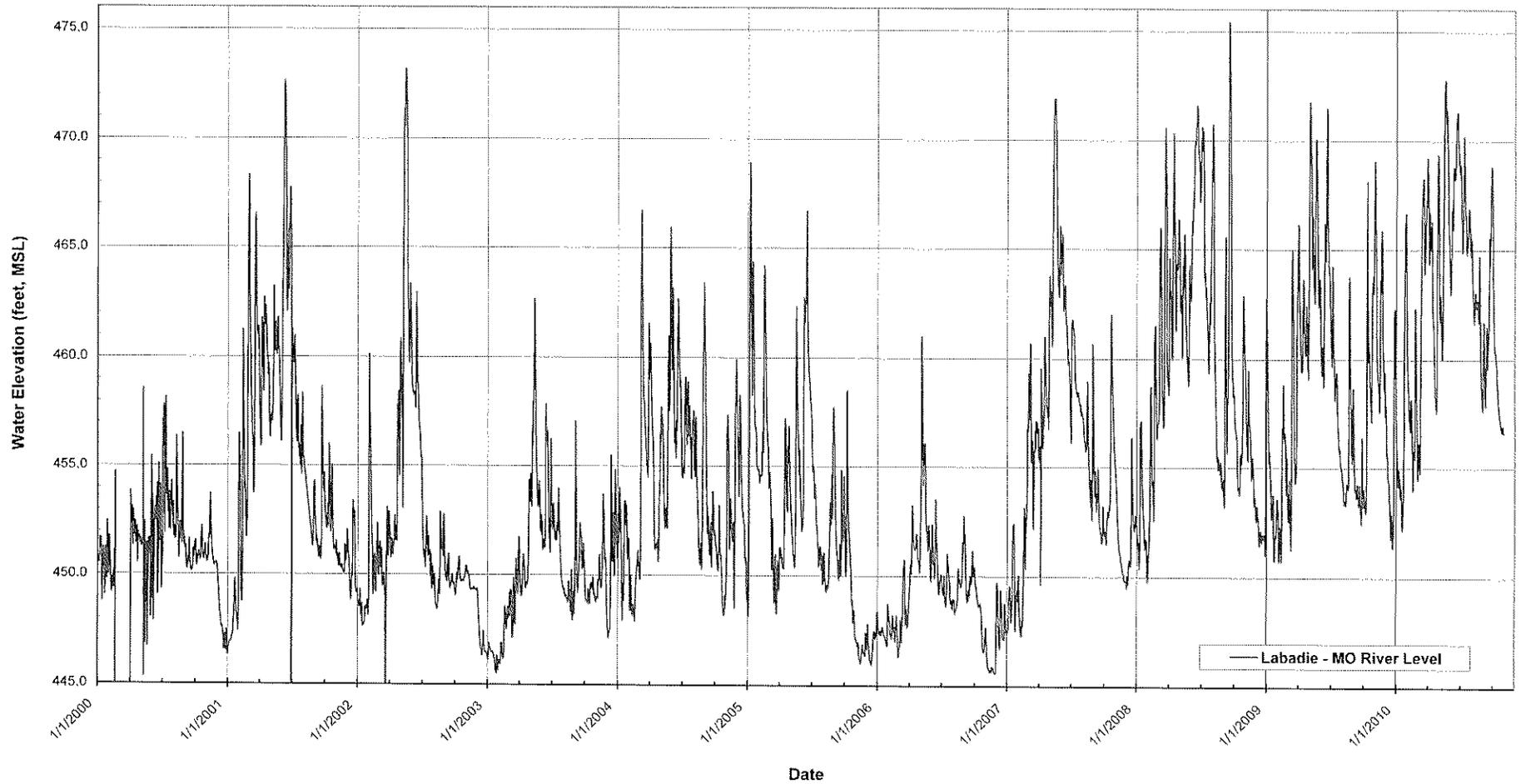
16

Terzaghi, Karl, Ralph B. Peck, Gholamreza Mesri (1996). Soil Mechanics in Engineering Practice, 3rd Edition. John Wiley & Sons, New York, 549 p.

Detailed Site Investigation
Proposed Utility Waste Disposal
Ameren Missouri Labadie Power Plant

Missouri River 10-Year Historical Data (2000-2010)

FIGURE 32



CONFIDENTIAL BUSINESS INFORMATION

Ameren Missouri Labadie Power Station Utility Waste Landfill DESIGN BASIS FOR GROUND WATER LEVEL

April 9, 2012

Introduction and Purpose

The County Commission amended the County's Unified Land Use Regulations on October 25, 2011 to add regulations concerning Non-Utility Waste and Utility Waste Landfills (UWL) in Franklin County, Missouri. Article 10, Section 238(C)(3) of these amended regulations requires in part that:

- c.) *The clay or composite soil component at the base of the Utility Waste Landfill shall be at least two (2) feet above the Natural Water Table in the site area.*

Section 238(A)(11) defines "Groundwater" as "*Water below the land surface in the zone of saturation.*"

Section 238(A)(19) defines "Natural Water Table" as:

The level at which water stands in a fully saturated unconfined aquifer as measured by shallow piezometers or wells. The natural water table is under static hydrologic conditions and uninfluenced by groundwater pumping or other engineered activities.

The site of the proposed UWL at Ameren Missouri's Labadie Power Station is located in the alluvial deposits adjacent to the Missouri River. As demonstrated in the Detailed Site Investigation (DSI) for this project¹ the ground water levels are strongly influenced by the Missouri River (page 39 of DSI Report). Because the Missouri River is an "open river," that is not controlled by a dam in the vicinity of the Labadie Power Station, the level of the Missouri River and hence the natural water table at the site are constantly changing. Therefore, the Natural Water Table is never "under static hydrologic conditions."

The amended County Unified Land Use Regulations allow the Independent Registered Professional Engineer to review and approve certain UWL requirements after evaluation of a specific UWL site and consultation with the UWL owner and engineer. This paper presents a rational definition of the "Natural Water Table" as it applies to the site of the proposed UWL at Ameren Missouri's Labadie Power Station, as a basis for design of the UWL. This report was prepared at the request of Ameren Missouri by Reitz & Jens, Inc., the Designer of Record for the Labadie UWL.

Brief Project Description

The Labadie UWL will be developed on property contiguous with the boundary of property upon which the Labadie Power Station is situated, on the right descending (south) overbank area of the

¹ *Detailed Site Investigation Report for Ameren Missouri Labadie Power Plant Proposed Utility Waste Disposal Area, Franklin County, Missouri*, dated February 4, 2011, revised March 30, 2011. Approved by Missouri Department of Natural Resources, Division of Geology and Land Survey on April 8, 2011.

CONFIDENTIAL BUSINESS INFORMATION

Ameren Missouri Labadie Power Station UWL
Design Basis for Ground Water Level
April 9, 2012

Missouri River between River Miles 56.71 and 57.38. The existing ground surface ranges from about el. 471 to el. 465² below the current design of the UWL. The areas of lower ground surface elevations (below about el. 464) located in the southeast region of the site are in potential wetlands and therefore have been excluded from the proposed developed area of the UWL.

The UWL site is currently protected from regular Missouri River flooding by the Labadie Bottom Levee District agricultural levee with heights at or near the 100-year flood elevation. In the unlikely event that the agricultural levee is overtopped or breached, the UWL site is further protected from direct Missouri River flood currents by the Labadie Power Station itself which is upstream and higher than the 500-year flood elevation, creating a low velocity shadow, or ineffective flow area, over the entire UWL site. The regulatory 100-year base flood elevation (BFE) of 483.98 at the upstream end of the UWL site became effective on October 18, 2011. The 500-year flood elevation at this river station is reported by FEMA to be 487.55. By comparison, the flood crest at this location in August 1993 was about el. 483.6. The planned top of the constructed perimeter berms of the Labadie UWL will be at el. 488.

Ground Water Levels and Missouri River Data

The daily average levels of the Missouri River at the Labadie Power Station from December 3, 1999, through November 9, 2010, were used in the analyses of the hydrogeology of the site for the DSI because these are the only Missouri River readings close to the site. The 3973 readings are plotted in Figure 32 (attached) from the DSI Report. The graph of the data demonstrates the highly variable nature of the Missouri River level at the site. The highest level in the data is el. 475.4 which occurred on September 16, 2008. The lowest level in the data is el. 393.0 which occurred on June 29, 2001. Below is a table of the frequencies of the Missouri River levels in 2-foot intervals from these data:

Frequencies of Missouri River Levels at Labadie Power Station (2000-2010)

Range	No.	%	% Greater
474-475.4	3	0.08%	
472-473	12	0.30%	0.38%
470-471	52	1.31%	1.69%
468-469	75	1.89%	3.57%
466-467	77	1.94%	5.51%
464-465	132	3.32%	8.83%
462-463	187	4.71%	13.54%
460-461	225	5.66%	19.20%
458-459	263	6.62%	25.82%
456-457	348	8.76%	34.58%
454-455	365	9.19%	43.77%
452-453	518	13.04%	56.81%
450-451	801	20.16%	76.97%
448-449	577	14.52%	91.49%
393-448	338	8.51%	100.00%

² Elevations herein refer to the North American Vertical Datum of 1988 (NAVD88) which is the datum used in FEMA's new Flood Insurance Rate Maps (FIRM). NAVD88 corrects many of the problems with the earlier NGVD of 1929.



CONFIDENTIAL BUSINESS INFORMATION

Ameren Missouri Labadie Power Station UWL
Design Basis for Ground Water Level
April 9, 2012

The ground water levels at the site were monitored monthly for the DSI from December 2009 through November 2010. The data show that the alluvial aquifer discharges toward the Missouri River during periods of relatively low flow, during which time the ground water levels below the site will be 1 to 3 feet above the Missouri River level. However, when the Missouri River is above about el. 461 for a sustained period, the ground water flow reverses and the ground water levels approach the level of the Missouri River near the river (in the northwest portion of the site) and about 5 feet or more below the river level over the majority of the site.

This is demonstrated in the graph of the average water table elevations versus the Missouri River elevation in Figure 31 from the DSI Report. From June 5, 2010, through July 5, 2010, the Missouri River elevation at the plant was above el. 465.1, and reached a maximum of el. 471.3. During this period, the average ground water table below the site rose to el. 464, with the average ground water table approaching el. 465 in the northwest portion of the site. The level of the Missouri River at the plant also was above el. 465 between May 13 and May 30, 2010, with a maximum level of el. 472.8. During this shorter duration of sustained high river levels (18 days compared to 30 days in June and July), the average ground water table beneath the site rose from el. 462.0 to el. 463.0. Therefore, it appears from these data that the ground water table beneath the site will rise to about el. 464 when the Missouri River at the plant is above el. 465 for about 30 days and reaches a maximum level above el. 471 during that period. How often do such sustained high Missouri River levels occur at the site?

From the above table, the Missouri River was at or above el. 465 about 9% of the days from December 1999 through November 2010, and was at or above el. 470 about 1.7% of the days. There were 12 intervals during this decade during which the Missouri River at the plant was above el. 465 for more than 5 days and during which time the river level exceeded el. 470. However, the Missouri River level was above el. 465 for more than 13 days during only 5 of these intervals:

Periods of Sustained High Missouri River Levels at Labadie Power Station (2000-2010)

Period	No. Days	Maximum River Elev.
June 3 – July 8, 2008	36	471.6
June 5 – July 5, 2010	30	471.3
May 2 – May 20, 2002	19	473.2
May 13 – May 30, 2010	18	472.8
May 9 – May 21, 2007	13	471.9

As stated above, the data from the 12 months of ground water level monitoring at the site indicate that the maximum average ground water level of about el. 464 may occur when the sustained high Missouri River level at the Labadie Power Station exceeds el. 465 for more than 18 days, and probably approaching 30 days, with a peak river level above el. 471. While the level of the Missouri River at the site has exceeded el. 470 about 1.7% of the 3973 days from December 1999 through November 2010, an interval of sustained high river levels adequate to create a high average ground water level of el. 464 has occurred only twice. **Therefore, the definition of el. 464 as the average “Natural Water Table” at the site would appear to be an extreme event that occurs for a relatively short duration only about two times in a 10-year period.**

CONFIDENTIAL BUSINESS INFORMATION

Ameren Missouri Labadie Power Station UWL
Design Basis for Ground Water Level
April 9, 2012

Page 4

Requirements for “Beneficial Use”

The Missouri Department of Natural Resources (MDNR) has previously permitted the use of CCR as fill for “beneficial use” without a clay liner if the fill was above the normal annual high ground water level. Adoption of el. 464 at the proposed site of the Labadie UWL would satisfy this requirement.

Summary

The current Franklin County Land Use regulations for Utility Waste Landfills require that the clay or composite soil component at the base of the Utility Waste Landfill shall be at least two (2) feet above the Natural Water Table in the site area, and that the definition of “Natural Water Table” is the “static hydrologic conditions uninfluenced by groundwater pumping or other engineered activities.”

The site of the proposed UWL at Ameren Missouri’s Labadie Power Station is located in the alluvial deposits adjacent to the Missouri River. As demonstrated in the Detailed Site Investigation (DSI) for this project, the ground water levels are strongly influenced by the Missouri River. Because the Missouri River is an “open river,” the level of the Missouri River and hence the natural water table at the site is never under truly “static hydrologic conditions.” Based upon the 12 months of monitoring of ground water levels at the site and almost 11 years of daily Missouri River level readings at the Labadie Power Station, the definition of el. 464 as the average “Natural Water Table” at the site would appear to be an extreme event that occurs for a relatively short duration only about two times in a 10-year period, and therefore would satisfy the intent of the Franklin County Land Use regulations.

Attachments

Figure 31 from DSI Report, “Monthly Average Water Table Elevation VS Missouri River Elevation”
Figure 32 from DSI Report, “Missouri River 10-Year Historical Data (2000-2010)”

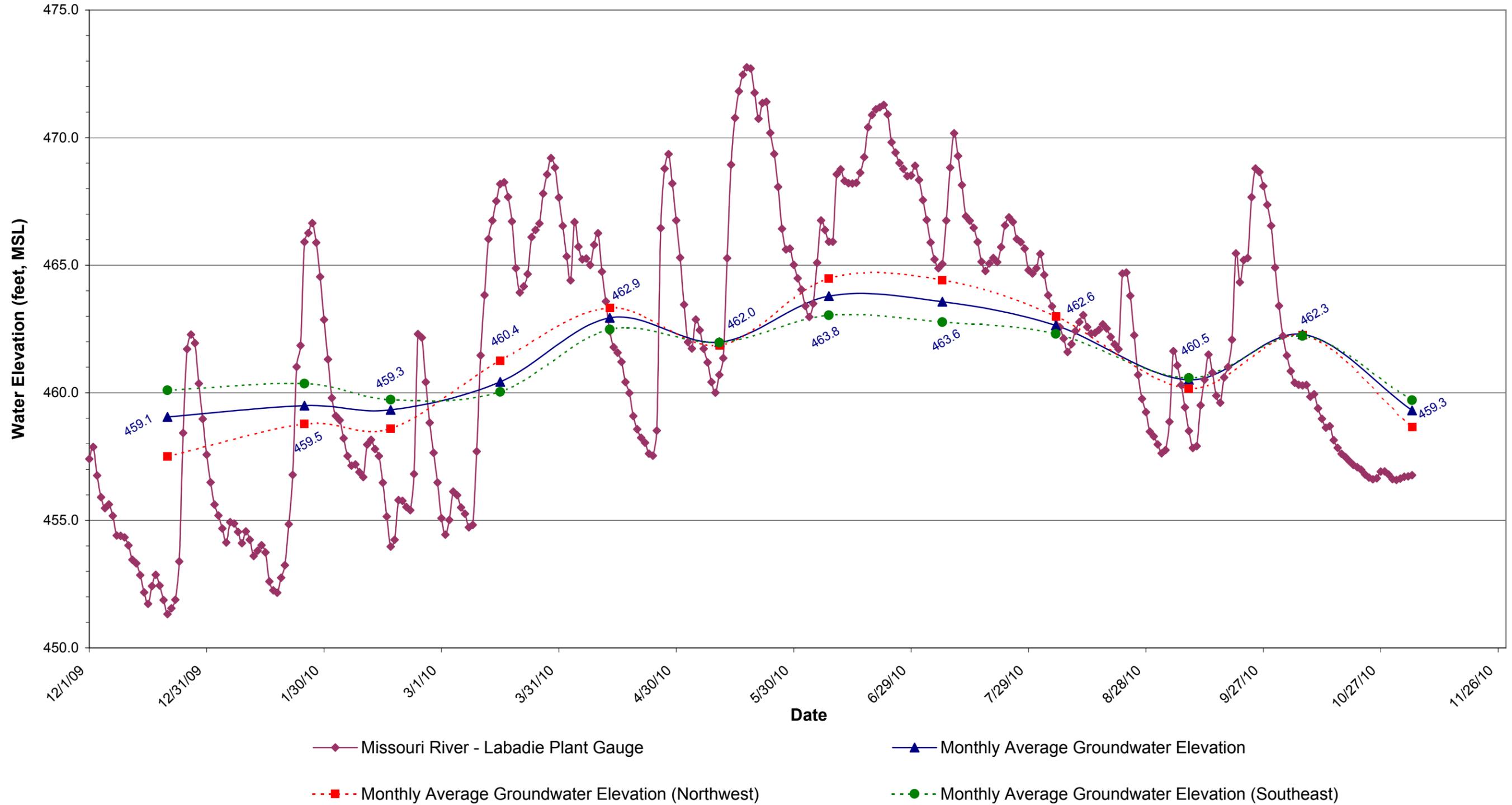
\\fs01\projects\amerenu\2008012455\design details\design basis gwt\design basis-labadie uw1 gwt-040912.doc



**Detailed Site Investigation
Proposed Utility Waste Disposal
Ameren Missouri Labadie Power Plant**

Monthly Average Water Table Elevation vs Missouri River Elevation

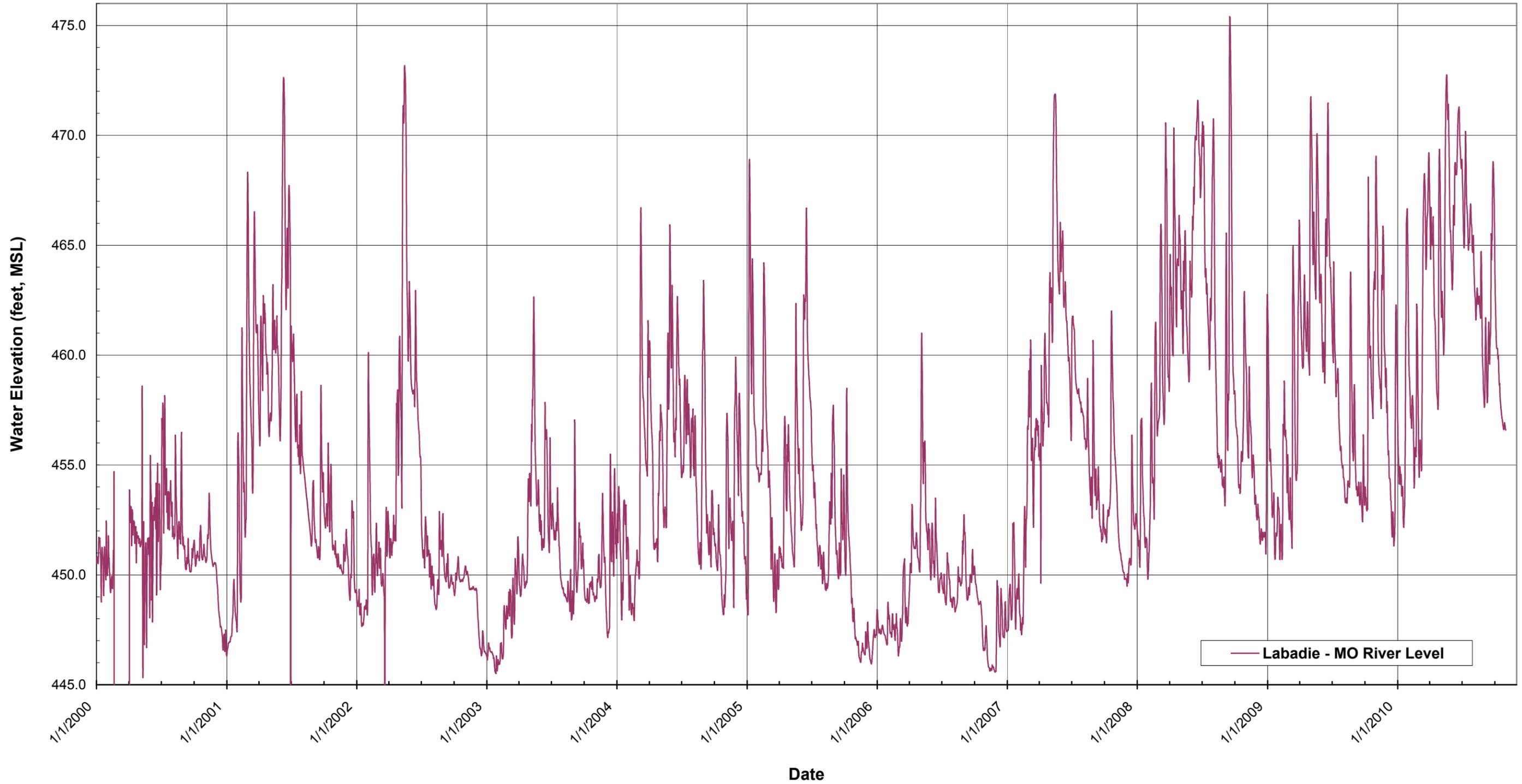
FIGURE 31



Detailed Site Investigation
Proposed Utility Waste Disposal
Ameren Missouri Labadie Power Plant

Missouri River 10-Year Historical Data (2000-2010)

FIGURE 32



CONFIDENTIAL BUSINESS INFORMATION

Ameren Missouri Labadie Power Station Utility Waste Landfill DESIGN BASIS FOR EXTERIOR BERMS

April 10, 2012

Introduction and Purpose

The County Commission amended the County's Unified Land Use Regulations on October 25, 2011 to add regulations concerning Non-Utility Waste and Utility Waste Landfills (UWL) in Franklin County, Missouri. Article 10, Section 238(C)(3) of these amended regulations requires in part that:

- d.) *All "cells" shall be designed and constructed so that they shall be protected by an exterior berm meeting the following criteria:*
- i.) *The top of the berm at a minimum shall be equal to the five hundred (500) year flood level in the area of the proposed Utility Waste Landfill.*
 - ii) *... All berms shall be constructed of concrete or cement-based material sufficiently thick for the purpose intended and approved by the Independent Registered Professional Engineer.*

The amended County Unified Land Use Regulations allow the Independent Registered Professional Engineer to review and approve certain UWL requirements after evaluation of a specific UWL site and consultation with the UWL owner and engineer. This paper will help define the "purpose intended" as it applies to the exterior berms for the proposed UWL at Ameren Missouri's Labadie Power Station and present a recommended design. This report was prepared at the request of Ameren Missouri by Reitz & Jens, Inc., the Designer of Record for the Labadie UWL.

Brief Project Description

The Labadie UWL will be developed on property contiguous with the boundary of property upon which the Labadie Power Station is situated, on the right descending (south) overbank area of the Missouri River between River Miles 56.71 and 57.38. The UWL site is currently protected from regular Missouri River flooding by the Labadie Bottom Levee District agricultural levee with heights at or near the 100-year flood elevation. In the unlikely event that the agricultural levee is overtopped or breached, the UWL site is further protected from direct Missouri River flood currents by the Labadie Power Station itself which is upstream and higher than the 500-year flood elevation, creating a low velocity shadow, or ineffective flow area, over the entire UWL site. The regulatory 100-year base flood elevation (BFE) of el. 483.98¹ at the upstream end of the UWL site became effective on October 18, 2011. The 500-year flood elevation at this river station is reported by FEMA to be el.

¹ All elevations refer to the North American Vertical Datum of 1988 (NAVD88) which is the datum used in FEMA's new Flood Insurance Rate Maps (FIRM).

CONFIDENTIAL BUSINESS INFORMATION

Ameren Missouri Labadie Power Station UWL
Design Basis for Exterior Berms
April 10, 2012

Page 2

487.55. By comparison, the flood crest at this location in August 1993 was about el. 483.6. The planned top of the constructed perimeter berms of the Labadie UWL will be at el. 488. The total area of the UWL when completed will be approximately 280 acres. The UWL will be constructed in cells, as defined by the Franklin County land use regulations, with each cell designed to contain a minimum of 5 years of the coal combustion residuals (CCRs) produced by the Labadie Plant. As planned prior to adoption of the new Land Use regulations in October 2011, each cell will be fully surrounded by a perimeter berm. The primary purpose intended for these berms is to separate the CCRs in the UWL from coming in contact with floodwater. The internal angle of friction of the CCRs that will be deposited in each cell will be sufficiently high so as to create a stable fill that does not require the perimeter berms for stability.

Two types of perimeter berms will be built. Exterior berms are those that will form the perimeter of the fully developed 280-acre UWL. Interior berms are those that initially will form a portion of each cell's perimeter, but will ultimately be covered with CCRs as future cells are developed. Some exterior berms infrequently may be in contact with a flow of flood water of the Missouri River, but only when the Labadie Bottom Levee District levee is overtopped or breached. The interior berms may also infrequently come in contact with flood water, but the water velocities will be too low to cause erosion. In both instances a vegetated cover alone would provide sufficient erosion protection, as with standard levee design. Because the CCR mass and perimeter berms are inherently stable, concrete and/or cement-based material will be used only to prevent possible erosion of the exposed slopes of perimeter berms that may be subject to the flow of flood water.

The general height and geometry of the exterior and interior berms will be as shown in Figure 1. The exterior berms will be constructed with compacted soil and the inside slope will be covered with a composite liner in accordance with the Missouri Department of Natural Resources (MDNR) regulations. The outside slope of the exterior berms will have a concrete or cement-based layer to protect against erosion from flood water (the "purpose intended"). Interior berms will be constructed with a core of CCRs and a compacted clay cap and vegetated cover on their outside slope. The composite liner will extend under the interior berm and tie into the exterior slope's clay cap to encapsulate the CCRs in accordance with MDNR regulations and allow extension of the composite liner beneath the next cell. Both side slopes of the perimeter berms will be 3 horizontal to 1 vertical (3:1). The top of the perimeter berms will be constructed to el. 488.0, that is 0.45 feet above the 500-year flood level, as required by the Franklin County Land Use regulations. The height of the berms above existing ground surface will vary but average about 23 feet.

Berm Design Basis Using Concrete or Cement-Based Materials

Reitz & Jens has researched and evaluated alternatives for using concrete or cement-based materials for erosion protection of the exposed slopes of exterior berms at the Labadie UWL. Our



CONFIDENTIAL BUSINESS INFORMATION

Ameren Missouri Labadie Power Station UWL
Design Basis for Exterior Berms
April 10, 2012

Page 3

recommendation is to incorporate fabric-formed concrete mats (FCM) constructed using manufactured fabric forms and cast-in-place concrete (example shown in photo below). Evenly-spaced sewn filter “windows” or inserted plastic weep holes prevent excess hydrostatic pressures beneath the FCM as floodwater that may be present from time to time recedes. Some options include windows in the FCM to permit growing a vegetative cover. The forms are typically available in 4-,



6- or 8-inch thicknesses. The required thickness will be determined based on the hydraulic conditions. The ducts between the block compartments are limited to 10% of the maximum thickness of the blocks to achieve flexibility and articulation of the finished FCM, to accommodate differential settlement. Reinforcing cables may be inserted through the block compartments to provide additional strength, if necessary for severe applications or for slopes up to 2:1. The design of the FCM will be based upon hydraulic analyses of the maximum flow that may result from overtopping or a breach of the Labadie Bottom levee at the worst case location for each section of the exterior berms. The FCM will be placed on geotextile filter or crushed rock base to prevent loss of soil.

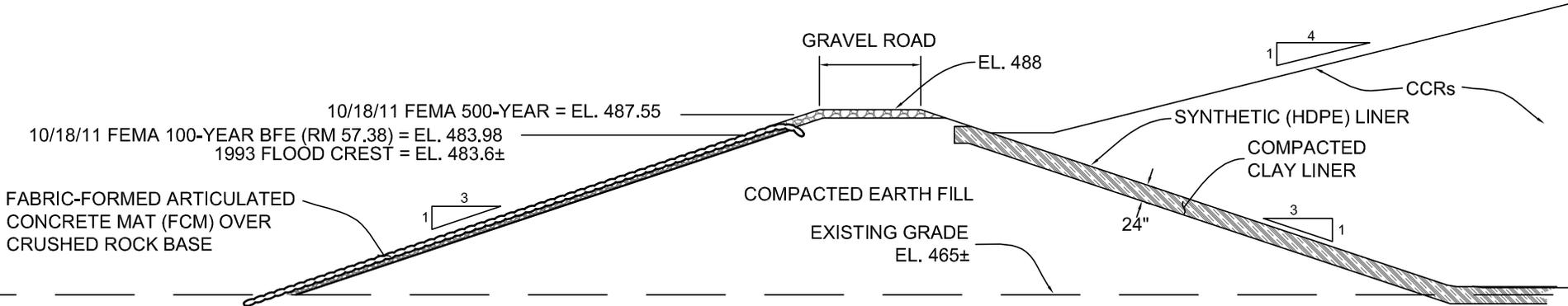
Summary

The current Franklin County Land Use regulations for Utility Waste Landfills require that all exterior berms be constructed of concrete or cement-based material sufficiently thick for the purpose intended. As explained above, the primary purpose intended for these berms is to separate the coal combustion residuals in the UWL from coming in contact with flood water. To comply with these regulations, the UWL design includes building the exterior berms with a soil core and fabric-formed concrete mat surface to protect the exterior slopes from floodwater that could result from a breach or overtopping of the existing Labadie Bottom Levee District levee along the Missouri River. The FCM has the following advantages:

- construction uses pre-manufactured fabric forms,
- erosion-resistant concrete face,
- weep holes or “windows” to relieve excess hydrostatic pressure,
- exposed exterior concrete for visual inspection,
- can be installed without heavy construction equipment (disturbing surrounding areas),
- articulated to compensate for differential settlement, and
- does not create rigidity within berms that could cause cracking and piping.

\\fs01\projects\amerenue\2008012455\design details\perimeter concrete berm\design basis-labadie uwl exterior berms-041012.doc

CONFIDENTIAL BUSINESS INFORMATION



Ameren Labadie UWL
RECOMMENDED DESIGN FOR
EXTERIOR BERMS

**Ameren Missouri
Labadie Energy Center
Construction Permit Application for a
Proposed Utility Waste Landfill
Franklin County, Missouri**

**Ameren Missouri
Power Operation Services
3700 South Lindbergh Blvd.
St. Louis, Missouri 63127**

**January 2013, Revised August 2013,
Revised November 2013**

Prepared By:

**Reitz & Jens, Inc.
1055 Corporate Square Drive
St Louis, Missouri 63132
(314) 993-4132**

and

**GREDELL Engineering Resources, Inc.
1505 East High Street
Jefferson City, Missouri 65101
(573) 659-9078**



*Paul Greddell
12/11/2013*

**Ameren Missouri Labadie Energy Center
Construction Permit Application (CPA)
for
Proposed Utility Waste Landfill (UWL)
Solid Waste Disposal Area
Franklin County, Missouri**

January 2013, Revised August 2013, Revised November 2013

Table of Contents

1.0	INTRODUCTION.....	1-1
1.1	Site Background.....	1-2
1.2	Proposed Facility (Revised August 2013)	1-3
1.3	Landfill Owner and Operator	1-4
1.4	Applicant Violation History (Revised August 2013)	1-4
1.5	Request for Recommendation from East Central Solid Waste Management District, Region I.....	1-4
2.0	SITE SELECTION.....	2-1
2.1	Site Location	2-1
2.2	Legal Description of the Property	2-1
2.3	Site Access (Revised August 2013; Revised November 2013).....	2-1
2.4	Zoning and Land Use (Revised November 2013)	2-2
2.5	Surrounding Land Use	2-3
2.6	Site Topography.....	2-4
2.7	Utilities (Revised August 2013)	2-4
2.8	Site Selection Location Restrictions.....	2-5
	2.8.1 Preliminary Site Investigation (PSI)	2-6
	2.8.2 Detailed Site Investigation (DSI)	2-6
	2.8.3 Floodplains (Revised August 2013)	2-6
	2.8.4 Wetlands	2-7
	2.8.5 Seismic Impact Zone.....	2-7
	2.8.6 Unstable Areas (Revised August 2013; Revised November 2013)	2-8
2.9	Geotechnical Investigations	2-10
	2.9.1 Soils (Revised August 2013)	2-11
	2.9.2 Bedrock	2-12
	2.9.3 Groundwater Occurrence	2-12
2.10	Survey Control	2-14
	2.10.1 Boundary Survey.....	2-14

**Ameren Missouri Labadie Energy Center
Construction Permit Application (CPA)
Table of Contents**

January 2013, Revised August 2013, Revised November 2013

2.10.2	Permanent Survey Control Points	2-14
3.0	LANDFILL DESIGN.....	3-1
3.1	Description of Landfill Design(Revised November 2013).....	3-1
3.1.1	Project Background Summary.....	3-3
3.1.2	Technical Background Summary	3-3
3.1.3	Environmental Protection (Revised November 2013)	3-3
3.1.4	Compliance with 10 CSR 80-11.010	3-4
3.2	Volume of the Proposed Landfill	3-6
3.2.1	Landfill Life Expectancy	3-6
3.2.2	Soil Material Volume (Revised August 2013).....	3-6
3.3	Construction Sequence.....	3-7
3.3.1	UWL Construction Sequence.....	3-8
3.3.2	UWL Disposal Area Construction Sequence (Revised November 2013).....	3-8
3.3.2.1	Phase Construction Sequence (Revised August 2013; (Revised November 2013))	3-8
3.3.2.2	Flood and Liquefaction Impact Mitigation Plans (Revised August 2013)	3-9
3.3.2.3	Franklin County Requirement - Erosion Protection (Revised August 2013)	3-12
3.3.3	Phased Development.....	3-13
3.3.4	Excavation to Proposed Subgrade (Revised August 2013)	3-14
3.3.5	Miscellaneous Construction	3-14
3.4	Final Contours.....	3-15
3.5	Solid Waste Accepted.....	3-15
3.6	Solid Waste Excluded	3-16
3.7	Stormwater Management System	3-16
3.7.1	Stormwater Runoff Controls (Revised August 2013; Revised November 2013)	3-17
3.7.2	Water Quality Permits (Revised November 2013)	3-20
3.8	Landfill Liner.....	3-20
3.8.1	Grading Plan	3-20
3.8.2	Materials and Construction	3-21
3.8.2.1	Soil Component (Revised November 2013)	3-22
3.8.2.2	Geomembrane Component	3-23
3.9	Leachate Management System	3-23
3.9.1	Leachate Generation Rate (Revised November 2013)	3-24
3.9.1.1	Pre-Closure Generation Rate	3-24
3.9.1.2	Post-Closure Generation Rate.....	3-24
3.9.2	Water Storage and Disposal (Revised November 2013)	3-24
3.10	Groundwater Monitoring.....	3-26
3.10.1	Groundwater Quality	3-26

**Ameren Missouri Labadie Energy Center
Construction Permit Application (CPA)
Table of Contents**

January 2013, Revised August 2013, Revised November 2013

3.10.2	Groundwater Monitoring System (Revised August 2013, Revised November 2013).....	3-27
3.10.3	Corrective Action.....	3-29
3.11	Cover Material.....	3-29
3.11.1	Soil Cover Sources	3-30
3.12	Landfill Final Cover (Revised August 2013).....	3-30
3.12.1	Materials and Construction (Revised August 2013)	3-31
3.12.1.1	Soil Component (Revised August 2013).....	3-31
3.12.2	Vegetation	3-31
3.13	Air Quality.....	3-32
3.14	General Maintenance of Landfill Systems.....	3-32
3.15	Closure and Post-Closure (Revised August 2013).....	3-32
4.0	LANDFILL OPERATION	4-1
4.1	Construction and Development.....	4-1
4.1.1	Phased Development.....	4-1
4.1.2	Sequence of Phase Construction (Revised November 2013).....	4-2
4.1.3	Construction Quality Assurance (CQA).....	4-5
4.1.4	Survey Control (Revised August 2013)	4-5
4.2	Operational Description.....	4-6
4.2.1	UWL Disposal Operational Description.....	4-6
4.2.2	Flood and Liquefaction Impact Mitigation Plans (Revised August 2013).....	4-7
4.3	Solid Waste Accepted.....	4-8
4.4	Solid Waste Excluded (Revised August 2013).....	4-10
4.5	Water Quality (Revised August 2013, Revised November 2013)	4-10
4.5.1	Stormwater Management.....	4-11
4.5.2	Leachate Management in the UWL (Revised November 2013).....	4-12
4.5.3	Groundwater Sampling and Analysis Plan (Revised August 2013).....	4-12
4.6	Air Quality.....	4-13
4.6.1	Dust Control (Revised August 2013).....	4-13
4.7	Aesthetics	4-13
4.7.1	General Aesthetics.....	4-13
4.7.2	Mining for Beneficial Reuse (Revised August 2013).....	4-14
4.8	Equipment and Staffing.....	4-14
4.8.1	Primary Equipment.....	4-14
4.8.2	Equipment Maintenance	4-15
4.8.3	Back-Up Equipment (Revised August 2013).....	4-16
4.8.4	Staffing.....	4-17
4.9	Final Cover Material (Revised August 2013).....	4-18
4.10	Compaction.....	4-19
4.11	Safety.....	4-20

**Ameren Missouri Labadie Energy Center
Construction Permit Application (CPA)
Table of Contents**

January 2013, Revised August 2013, Revised November 2013

4.12 Records..... 4-20

List of Tables

Table 1 Applicable Regulatory References
 Table 1A Sorted by Table of Contents (Revised November 2013)
 Table 1B Sorted by Regulatory Citation
 Table 1C Revisions to Prior CPA Application (New November 2013)

List of Figures

Figure 1 Site Location Map
Figure 2 Sequence of Cell Construction
Figure 3 Entrance Sign Detail

List of Appendices

Appendix A Property Deeds
Appendix B Articles of Organization
Appendix C Good Standing Certificate (Revised November 2013)
Appendix D Violation History Disclosure Form (Revised August 2013)
Appendix E Request for Recommendation from East Central Solid Waste
 Management District, Region I
Appendix F Franklin County Requirements (Revised August 2013, Revised November
 2013)
Appendix G Adjacent Landowners or Landowners within 1000 feet (Revised November
 2013)
Appendix H Floodplain Documentation (Revised August 2013)
Appendix I Wetland Assessment
Appendix J Geotechnical Engineering Report for Construction Permit Application
 (Revised August 2013, Revised November 2013)

**Ameren Missouri Labadie Energy Center
Construction Permit Application (CPA)
Table of Contents**

January 2013, Revised August 2013, Revised November 2013

- Appendix K Soil Material Volume and Balance Calculations (Revised August 2013)
- Appendix L Landfill Life Estimate
- Appendix M Erosion Calculations
- Appendix N Stormwater Calculations
- Appendix O H.E.L.P. Model Results
- Appendix P Construction Quality Assurance Plan (Revised November 2013)
- Appendix Q Groundwater Sampling and Analysis Plan (Revised August 2013, Revised November 2013)
- Appendix R Closure and Post-Closure Plan
- Appendix S Utility Waste Landfill Emergency Contacts
- Appendix T Recordkeeping and Reporting Forms
- Appendix U Draft FAI
- Appendix V Survey Plat (Revised August 2013)
- Appendix W Groundwater Hydraulic Data (Revised August 2013)
- Appendix X Documentation of Groundwater Monitoring Well Design (Appendix X(b) Added November 2013)
- Appendix Y Miscellaneous Engineering Calculations (Revised August 2013; Appendix Y(c) Revised November 2013)
- Appendix Z Groundwater Demonstration and Design Basis Memoranda

List of Drawings

Set of 23 Sheets – Ameren Missouri Labadie Utility Waste Landfill (provided separately)
(Revised August 2013, Revised November 2013)

1.0 INTRODUCTION

Union Electric doing business as (dba) Ameren Missouri (hereafter referred to as Ameren Missouri) is requesting a State of Missouri Solid Waste Disposal Area Construction Permit for a Utility Waste Landfill (UWL) to be located in northeastern Franklin County. The proposed UWL name will be “Ameren Missouri Labadie Utility Waste Landfill”.

With this report, Ameren Missouri proposes to construct a UWL for disposal of coal combustion products (CCPs) from the Labadie Energy Center that pass the paint filter test (having no free liquids). This engineering report describes the facility and procedures that Ameren Missouri will use to dispose of all current and future CCPs produced by the Labadie Energy Center. This report describes the design, construction and operating techniques required to dispose of CCPs at the Labadie UWL.

The landfill design and operating procedures have been prepared in accordance with the UWL requirements of the Missouri Solid Waste Management Law and Rules and Franklin County ordinances. In addition, the design and operation of the proposed UWL have been developed in accordance with accepted engineering practice. This construction permit application, engineering design, operating manual and supporting appendices and reports are organized in a format consistent with the Missouri Solid Waste Management Rules 10 CSR 80-2 and 10 CSR 80-11 for UWL permitting, design and operation. As a reference guide, a correlation of the applicable Missouri Solid Waste regulatory references to the table of contents of this report is provided in Table 1A and Table 1B at the end of this report. Table 1A is sorted in the order of this report’s table of contents. Table 1B is sorted in order of the Missouri regulatory references.

Reitz & Jens, Inc. (Reitz & Jens) and GREDELL Engineering Resources, Inc. (Gredell Engineering) are the team of design professionals retained by Ameren Missouri to develop the UWL design and Construction Permit Application (CPA). Reitz & Jens’ scope of services as lead engineer included overall project management, UWL layout and design, characterizing the geotechnical engineering properties of the site, analyzing the site for global stability, settlement, flood protection, and identifying applicable criteria. Gredell Engineering’s scope of services, as a subconsultant to Reitz & Jens, included completing the Detailed Site Investigation, UWL layout and design, as well as preparing the engineering reports and plans necessary to complete the solid waste permitting documents for the Missouri Department of Natural Resources (MDNR).

Ameren Missouri acknowledges that one concept proposed for the UWL construction described in this report utilizes an alternative design concept that does not adhere strictly to MDNR’s historic interpretation of 10 CSR 80-11.010 for the design of the UWL. Specifically, the site conditions will result in intermittent contact of a small percentage of the constructed bottom liner (primarily at the sumps) with the alluvial groundwater. As allowed by 10 CSR 80-11.010(1), Sections 3.0 and 4.0 of this report, in conjunction with the details provided in the drawings and the appendices to this report, demonstrate that the design concepts proposed for the UWL

design meet or exceed the minimum requirements of 10 CSR 80-11.010.

The CCP disposal plan for the UWL will be implemented in four (4) phases (reference Sheet 3). The total acreage of the four (4) disposal phases is approximately 166.5 acres. The proposed phases are designed for disposal of all CCPs generated by the Labadie Energy Center. Currently, these CCPs consist primarily of fly ash (70%) and bottom ash (30%), but Flue Gas Desulfurization (FGD) byproducts will be generated when plant FGD scrubbers become operable. As proposed, each phase will consist of one disposal cell.

The UWL design has been developed in accordance with the requirements of 10 CSR 80-11.010. The UWL design will include a composite liner system, which exceeds these requirements. The composite liner system will consist of a 24-inch thick compacted clay component with a permeability not to exceed 1×10^{-7} cm/sec and a 60-mil thick HDPE geomembrane component, plus a leachate collection and drainage system to maintain less than 12 inches of hydraulic head on the liner system at any time during the life of the facility.

The approximate 166.5-acre CCP disposal area is designated for development and closure in phases with appropriate closure cost estimates and financial assurance instruments (FAIs) proposed for each phase. The phased development, operation and closure of the UWL are discussed in more detail in subsequent sections of this report.

1.1 Site Background

Ameren Missouri operates a coal-fired power plant known as the Ameren Missouri Labadie Energy Center. The Labadie Energy Center is located north of Interstate Highway 44 and northeast of the town of Labadie, Missouri on the south side of the Missouri River. The Labadie Energy Center was constructed from 1967 to 1970 and power generation began in 1970. The plant has a total generating capacity of 2,405 megawatts (MW). The current estimated annual production of CCPs (fly ash and bottom ash) is approximately 550,000 dry tons.

The proposed UWL site is immediately east of the power plant's existing CCP ash ponds. Currently, CCPs from the plant are wetted and placed in the ash ponds (NPDES permitted wastewater treatment devices) located on the south side of the power plant. A new flue gas desulfurization (FGD) system is scheduled to be built at the plant in the future. The FGD will generate an estimated maximum of 280,000 additional dry tons of CCPs per year. The UWL design includes the capacity to manage the FGD byproduct, as well as the other CCPs (e.g., fly ash and bottom ash) currently being produced by the plant.

This CPA details the design, construction and operational techniques for the proposed UWL at the Labadie Energy Center. Additional descriptions of the physical characteristics of the utility wastes to be managed at the UWL are described in Section 4.3.

The site lies in 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 in Franklin County, Missouri.

Reference to the Center for Applied Research and Environmental Systems (CARES) or similar mapping programs shows that the approximate midpoint of the proposed UWL is Latitude 38.5621 and Longitude -90.8168. The proposed UWL site is located approximately two and three-quarters (2.75) miles northeast of the town of Labadie, and two and three-quarters (2.75) miles northwest of the town of St. Albans (Figure 1).

The proposed UWL disposal area is located within a tract of land entirely owned by Ameren Missouri totaling over 1,000 acres, of which approximately 166.5 acres is planned for active disposal. The area method of waste disposal is proposed for use throughout the 166.5-acre waste boundary. Three (3) stormwater management ponds (a 5.7-acre pond for Phases 1 and 2, a 4.4-acre pond for Phase 3, and a 3.4-acre pond for Phase 4) are also located within the approximate 813-acre UWL permit boundary. Other areas within the UWL permit boundary will be used for soil stockpiles, access roads, perimeter fencing, flood protection berms, and buffer areas.

This CPA, drawings and associated reports and supporting documentation address the substantive requirements of the State of Missouri construction permit application, as well as applicable Franklin County ordinances, for the construction and operation of a UWL.

1.2 Proposed Facility

The proposed UWL covers a waste boundary area of approximately 166.5 acres of the 813-acre landfill permit boundary within the Ameren Missouri Labadie Energy Center Property. Sheet 2 shows the existing site conditions. An access road from the existing power plant to the UWL will be constructed near the northwest corner of Phase 1 across Labadie Bottom Road. Labadie Bottom Road divides Phases 1 and 2 of the proposed UWL site in the east-west direction and will be relocated as a part of the development of Phase 2. An underground pipeline owned by Explorer Pipeline runs generally north-south through the site in between Phases 1 and 2 (west of the pipeline) and Phases 3 and 4 (east of the pipeline). Two elevated access roads will be constructed across the pipeline as part of the Phase 3 development.

The DSI determined that insufficient clay is available on-site for constructing the clay soil liner component of the composite liner system. Therefore, an off-site borrow source of liner quality clay at Ameren Missouri's Callaway Energy Center in Callaway County, Missouri has been located, explored and identified through geotechnical exploration and testing and is proposed as the liner quality clay source for the Labadie Energy Center UWL. Approximately 1.75 feet of vegetative soil will be stripped from the 225-acre footprint of the proposed UWL for use as the vegetative soil cover on the final cap. For general discussion in this report, the size of the UWL will be referred to as the 813-acre UWL permit boundary and a 166.5-acre waste boundary.

The entire 813-acre UWL permit boundary is zoned by Franklin County as Agricultural Non-Urban (ANU) (refer to Sheet 4). Improvements within the UWL permit boundary include the 166.5-acre waste disposal area, stormwater management ponds, soil stockpile areas, flood

protection berms, perimeter stormwater control structures, site access roads, perimeter security fencing, buffer zones, and groundwater monitoring. These items are discussed in more detail in Section 3.0, Landfill Design. Sheet 3 provides an overview of the proposed UWL project and Sheet 4 shows the waste boundary and the UWL permit boundary.

1.3 Landfill Owner and Operator

Union Electric Company d.b.a. Ameren Missouri is the owner and operator, as defined by 10 CSR 80-2.010(67) and 10 CSR 80-2.010(68), of the land within the UWL permit boundary. A copy of the property deeds for this tract is found in Appendix A.

Union Electric Company is a registered Missouri corporation in good standing with the Secretary of State's office. Appendix B provides a copy of Union Electric Company's Certificate of Amendment to Articles of Organization from the Missouri Secretary of State's Office. A Registration of Fictitious Name for Ameren Missouri is also provided in Appendix B. A copy of a current Certificate of Corporate Good Standing is found in Appendix C.

1.4 Applicant Violation History

Ameren Missouri, a subsidiary of Ameren, is the sole interest in the application for construction permit. Ameren Missouri has maintained and submitted an annual update of the Violation History Disclosure Statement since the issuance of the Missouri Solid Waste Disposal Area Construction Permit No. 0918301 for the Sioux Power Energy Center UWL on March 28, 2008, as required. MDNR has accepted Ameren Missouri's violation history information submitted for the Sioux Power Energy Center UWL. The March 25, 2013 letter transmitting Ameren Missouri's most recent, completed MDNR Violation History Disclosure Statement is found in Appendix D.

1.5 Request for Recommendation from East Central Solid Waste Management District, Region I

As required by 260.205.7 Missouri Revised Statutes (RSMo), Ameren Missouri requested a recommendation in support of this application for a UWL from the executive board of East Central Solid Waste Management District, Region I, on June 13, 2012. A copy of this letter is included in Appendix E. Region I does not currently have an approved solid waste management plan. Ameren Missouri will work with Region I to ensure that future revisions to their solid waste management plan include the Ameren Missouri Labadie UWL.

2.0 SITE SELECTION

Based on the findings of the Preliminary Site Investigation (PSI) and Detailed Site Investigation (DSI), the proposed Labadie UWL site is suitable for development of a modern, state-of-the-art and environmentally sound solid waste disposal area. The surrounding drainage patterns, topography and natural geologic and hydrologic conditions allow for the design and operation of a UWL that can provide necessary capacity, while maintaining the aesthetic and environmental quality of the surrounding area. The geologic suitability of the site as a UWL is supported by the Missouri Department of Natural Resources, Division of Geology and Land Survey's (MDNR-DGLS) February 2, 2009 letter approving the PSI for the UWL site, and MDNR-DGLS' April 8, 2011 letter approving the DSI for the Labadie UWL site

Both the State of Missouri Solid Waste Management Law and Rules and applicable Franklin County ordinances will regulate the Labadie UWL as a solid waste disposal area (e.g., landfill). Applicable portions of the Franklin County ordinances are provided in Appendix F. The requirements of the Franklin County ordinances are substantially compatible with the Missouri Solid Waste Management Rules.

2.1 Site Location

The site is located in northeastern Franklin County, in the northwestern part of Township 44 North, Range 2 East, approximately two and three-quarters (2.75) miles northeast of the town of Labadie, and two and three-quarters (2.75) miles southwest of the town of St. Albans (Figure 1). The site is located on the Labadie, MO U.S.G.S quadrangle topographic map. The cover sheet of the plans shows the UWL location in relation to the Ameren Missouri Labadie Energy Center, County Route T, Labadie Bottom Road, and the Missouri River.

2.2 Legal Description of the Property

Kuhlmann Design Group developed legal descriptions of the 813-acre proposed UWL permit boundary and the 166.5-acre waste boundary in 2012. A survey plat and legal descriptions of the proposed UWL permit boundary and waste boundary areas are provided in Appendix V. A copy of the property deeds and the detailed legal descriptions are provided in Appendix A.

2.3 Site Access

The site is located east of the Ameren Missouri Labadie Energy Center and south of the Missouri River. Site access will be from an all-weather access road extended from the existing plant to the perimeter flood protection berm near the northwest corner of Phase 1 as shown on Sheet 5. The access road will be built to a minimum elevation of 486, which is 2 feet above the 100-year flood elevation. The location of the site and public roads within one (1) mile of the site and beyond is shown on Sheet 1.

Franklin County has sole regulatory authority for the affected roadways. Franklin County has

issued a letter dated July 24, 2013, (copy enclosed in Appendix F) accepting the conceptual roadway relocation and overpass proposed by Ameren Missouri. Prior to any roadway construction, detailed plans will be completed and the required Franklin County permits will be obtained.

All CCPs will initially be delivered to the UWL by truck from Ameren Missouri's Labadie Energy Center using the all-weather access roads. Trucks will not travel on public roads when transporting CCPs from the Labadie Energy Center to the UWL. The top of the perimeter flood protection berms are designed to carry truck traffic within the UWL permit boundary. Traffic from the plant to the UWL will typically include trucks hauling utility waste (CCPs), maintenance vehicles or equipment and passenger vehicles for landfill employees. All CCPs trucked to the UWL will be moisture conditioned for dry placement in the UWL.

A seven-foot high security fence will be installed around the entire active UWL perimeter (reference Sheet 19, detail 5/19). Locked gates will be located at all ingress and egress points to the UWL waste boundary to control access to the disposal area. Ameren Missouri Labadie Energy Center security staff is on duty 24-hours per day and will provide additional security to the UWL through routine site monitoring. Only personnel authorized by Ameren Missouri will be allowed within the UWL perimeter security fence.

2.4 Zoning and Land Use

The property is currently zoned Agricultural Non-Urban (ANU). On October 25, 2011, Franklin County, by Commission Order No. 2011-307, amended Section 15, Article 2 of their Land Use Regulations to add a definition for Utility Waste Landfill, as well as Section 238 to Article 10 "Supplementary Use Regulations". Section 238 added regulations regarding Utility Waste Landfills including allowing Utility Waste Landfills as a permitted use in the ANU zoning district. A copy of the Commission Order regarding Utility Waste Landfill regulations, the definition of Utility Waste Landfill, and Section 238 are found in Appendix F. In addition, Appendix F contains the following correspondence from the County relative to this project:

- a letter dated August 21, 2012, from the County stating that the proposed site is in compliance with all existing Franklin County ordinances;
- a letter dated January 7, 2013, from the County Independent Registered Professional Engineer stating that they agree with the conceptual designs presented in pre-submittal meetings;
- a letter dated July 24, 2013, from the County stating that the conceptual Labadie Bottom Road proposed relocation and overpass is accepted, reserving the right to approve the final plan details before construction;
- a letter dated September 18, 2013, from the County, pursuant to Section 260.003 RSMo, certifying certain aspects and findings of the County's review specific to the

Franklin County ordinances;

- a letter dated October 10, 2013 from the County in response to MDNR's October 2, 2013 letter providing clarification of the September 18, 2013 County letter (referenced above);
- a letter dated December 4, 2013, from the County Independent Registered Professional Engineer and received by the County on December 8, 2013, stating that the Construction Permit Application and amendments meet the requirements of Commission Order No. 2011-307 (referenced above);
- a letter dated December 10, 2013, from the County to MDNR supplementing, confirming and restating their letters to MDNR dated September 18, 2013 and October 10, 2013.

Where applicable, Ameren Missouri will provide MDNR copies of future County correspondence as it is received.

2.5 Surrounding Land Use

The proposed UWL, as well as all contiguous properties surrounding the 813-acre UWL permit boundary, are located within unincorporated Franklin County.

As required by 10 CSR 11.010(4)(5)B, the location of all known residences, buildings, wells, watercourses, springs, lakes, rock outcroppings, caves, and sinkholes within one-quarter mile of the UWL waste boundary are shown on Sheet 4. The entire site and land adjacent to the site is currently zoned Agricultural Non-Urban (ANU). The nearby property on the bluffs to the south is currently zoned Community Development (CD). Adjacent land uses within these zoning designations include Ameren Missouri's Labadie Energy Center to the west, and residential use on the bluffs to the south. Current land use within one-quarter mile of the UWL waste boundary and adjacent to the UWL permit boundary is primarily agricultural and the majority of the property is owned by Ameren Missouri. One exception is the extreme southern arc of the line denoting one-quarter mile from the waste boundary that intersects a small portion of four parcels on the edge of the bluffs to the south. A list of names and addresses of all recorded owners of real property either adjoining or within 1,000 feet of the proposed UWL permit boundary is provided in Appendix G.

As required by 10 CSR 80-11.010(5) and Section 238.C.3.h of the Franklin County ordinances, a minimum 100-foot buffer zone has been maintained between the UWL waste boundary and dedicated public road right-of-ways, and a minimum 300 foot setback has been maintained between the UWL waste boundary and all property lines not under common ownership with the UWL site. All existing easements, jurisdictional wetlands and minimum buffers are shown on Sheets 2, 3 and 4. Ameren Missouri will relocate and/or vacate any public road, utility and easement within the UWL waste boundary, as necessary, prior to the construction of Phase 2 of the UWL. The UWL solid waste disposal boundary is significantly more than 300 feet from

the property lines north, east, south and west of the site.

The proposed UWL will cover approximately 166.5 acres of the 813-acre site. The maximum height of the proposed UWL is approximately 100 feet above the existing grades as shown on Sheet 10. The proposed maximum elevation of the UWL is 565. The final side slopes of the UWL will be a maximum of 3:1 (H:V). The top of the 3:1 side slopes begins at elevation 554 for Phases 1 and 2, and at elevation 556 for Phases 3 and 4. The 3:1 side slope ends at the perimeter ditch at the toe of the slope at approximate elevation 483. The top of the UWL will have a relatively flat, constant slope of no less than 2% that continues to rise to a peak elevation of 565. The side slopes of the disposal area are not expected to significantly flatten within the life of the facility as a result of internal consolidation of the dry CCP wastes.

2.6 Site Topography

The existing topography within the 813-acre permit boundary is relatively flat. Ground surface elevations range from 460 to 471 feet. The tract is mapped in the 100-year floodplain of the Missouri River and protected from regular flooding by the Labadie Bottom Levee District's agricultural levee located both north and south of Ameren Missouri's property. There is one topographic ridge, approximately five (5) feet high in the north part of site (Phase 2) and several shallow drainage features within the levee protected area south and southwest of the proposed waste boundary that drain to the southern boundary of Ameren Missouri's property. This drainage system is regularly pumped over the levee into Becker Creek where the discharge ultimately flows from west to east back to the Missouri River along the bluffs. The 813-acre site generally drains from northwest to southeast.

The Labadie Energy Center and ash pond embankments to the west, as well as levees on the north and south block river water from flowing onto the UWL site, except in the most severe floods. The topography surrounding the 813-acre tract is composed of the broad, flat floodplains of the Missouri River that is similar to the flat topography of the site. The Missouri River lies generally to the north of the UWL. The bluffs bordering the Missouri River valley are adjacent the proposed UWL permit boundary to the south, but are separated from the UWL boundary by the southern portion of the Labadie Bottom Levee District levee, an existing railroad embankment, and Becker Creek.

2.7 Utilities

Sheet 2 shows the existing site conditions, including all existing utilities. The existing utilities within the proposed UWL permit boundary include underground pipelines, underground telephone, overhead power (electric), fiber optic cable, and small drainage culverts.

Underground telephone lines are located along the Labadie Bottom Levee District levee to the south and generally parallel to the southern landfill permit boundary. The underground telephone lines are located outside the proposed construction boundaries of the UWL.

Existing overhead power lines are located west and generally parallel to the western waste boundary along Phases 1 and 2. Ameren Missouri owns and maintains these power lines. The power lines do not need to be relocated to accommodate the construction and/or operation of the UWL.

An underground pipeline, owned by Explorer Pipeline, is located southeast and east of the power plant and running north between UWL waste disposal area Phases 1/2 and Phases 3/4. The footprint of Phases 1 through 4 avoids conflicts with this existing pipeline. The development of the UWL next to the pipeline has been discussed with the Explorer Pipeline and was determined to be technically feasible. A copy of Ameren's November 15, 2012 email to Explorer Pipeline and Explorer Pipeline's January 28, 2013 letter concurring with the UWL development is provided in Appendix V.

An existing fiber optic line runs east-west along the Union Pacific Railroad right-of-way south of the UWL southern waste boundary and, therefore, is located outside the proposed construction boundaries of the UWL.

The access road from the plant to the UWL will cross over Labadie Bottom Road during the operation of all landfill Phases. An access road overpass is planned which will allow continuous operation of the UWL and segregate the UWL traffic from public traffic on Labadie Bottom Road. Future access roads will cross over the existing Explorer pipeline to provide access from Phases 1 and 2 to Phases 3 and 4. Requirements for building these access roads have been discussed with Explorer Pipeline and will be incorporated into the future access road design.

2.8 Site Selection Location Restrictions

Missouri's solid waste disposal area rules require applicants to follow a two-step site evaluation process prior to filing an official construction permit application. Step one is to apply for a Preliminary Site Investigation (PSI) to the Division of Geology & Land Survey (DGLS). Step two follows approval of the site under the PSI process and consists of conducting a Detailed Site Investigation (DSI) of the site geology and hydrology. These steps are discussed in more detail below.

On October 9, 1991, the United States Environmental Protection Agency (EPA) published 40 CFR Part 258, which contained the final rules for the federal Solid Waste Disposal Facility Criteria applicable to municipal solid waste disposal areas. The federal location restrictions do not apply to UWLs; however, the State of Missouri modeled site restrictions for UWLs after the federal requirements for municipal solid waste landfills.

Four (4) specific location restriction criteria must be evaluated when siting a utility waste landfill in Missouri. The site selection requirements and each specific location restriction criteria are discussed below as they relate to the proposed landfill.

2.8.1 Preliminary Site Investigation (PSI)

On December 3, 2008, a PSI request was submitted on behalf of Ameren Missouri in compliance with 260.205.2 and 10 CSR 80-2.015 to request consideration for development of a solid waste disposal area limited to the disposal of utility waste. This type of solid waste disposal area is defined by regulation as a UWL. By regulation, UWLs can only accept waste materials listed in 10 CSR 80-11.010 and specifically identified in this report.

This PSI request was reviewed and evaluated by the MDNR and the Division of Geology and Land Survey (DGLS). DGLS conducted a field inspection of the site and approved the PSI request on February 2, 2009.

2.8.2 Detailed Site Investigation (DSI)

A DSI work plan for the required geologic and hydrologic field site investigation work was submitted on behalf of Ameren Missouri to DGLS on May 18, 2009. DGLS reviewed the Detailed Site Investigation Work Plan and issued a written letter of approval on June 15, 2009. Fieldwork began on September 2009 and with the exception of survey work and monthly piezometric monitoring, was completed in January 2010. Groundwater level measurements, evaluation of field data, and preparation of a detailed geologic and hydrologic report continued through November 2010. A report containing the findings, conclusions and recommendations of the DSI process was submitted February 4, 2011. A revision to the DSI report was submitted to DGLS on March 30, 2011. DGLS issued final approval of the DSI report on April 8, 2011. Per 10 CSR 80-2.015(1)(D), approval indicates "...that the site has been found to have suitable geologic and hydrologic characteristics for development of an environmentally sound solid waste disposal area."

2.8.3 Floodplains

The project site is shown on FEMA's Flood Insurance Rate Maps (FIRM) 29071C0180D, 29071C0185D, 29071C0190D, and 29071C0195D for Franklin County, Missouri, that became effective on October 18, 2011. According to the FIRM, the site is located at approximate Missouri River Mile (RM) 57 with the regulatory 100-Year Flood Elevation (Base Flood Elevation, or BFE) at the UWL site of approximately 484. The current FIRM shows that project improvements will be made within Zone AE (100-year floodplain) within the regulatory floodway.

Panel 2904930105B of the superseded Flood Boundary and Floodway Map (FBFM) and Flood Insurance Rate Map (FIRM) for the site had an effective date of October 16, 1984. These FEMA maps showed the BFE at the UWL site to be approximately 480 and that the project improvements would be made in Zone A10, entirely outside the regulatory floodway.

The proposed UWL site and surrounding areas are protected from regular Missouri River flooding by the Labadie Levee District agricultural levee. The flows of the river are blocked from impacting the UWL site by the agricultural levee and the fill for the Labadie Energy Center

to the west (upstream) of the UWL. The power plant is built on fill that blocks flows during all floods up to the 500-year event, creating an ineffective or low flow area downstream of the plant. The entire UWL is located within this ineffective flow area. In addition, a perimeter berm will be constructed around the entire active disposal area that will function as a flood protection dike. The top of the perimeter berm will be at elevation 488.0, approximately 4 feet higher than the current 100-year BFE at the UWL site. As part of ongoing UWL operation and maintenance, both during operation and post-closure, the top of berm elevation will be periodically determined by level survey. If the elevation of the exterior berms settles below the 500-year elevation of 487.6, suitable fill will be added to the perimeter roads on the top of the berm to raise the minimum berm elevation to 488.0.

Ameren Missouri retained CDG Engineers to analyze the UWL development's impact on the regulatory Base Flood Elevations (BFE) of the Missouri River. This analysis determined that the project will create "No Rise" in the regulatory BFE of the Missouri River. This analysis was submitted to Franklin County for approval. In a letter dated January 22, 2013, Franklin County's Independent Professional Registered Engineer stated that they concur with the analysis and methodology provided by CDG Engineers, and recommended approval of the "No Rise" certificate. A copy of the referenced letter is included in Appendix H.

2.8.4 Wetlands

As required by 10 CSR 80-11.010(4)(B)2, the proposed UWL site has been evaluated for the presence of wetlands. On September 10, 2012 the United States Department of the Army, Kansas City District Corps of Engineers (USACE) issued a preliminary Jurisdictional Determination (JD) for the site that includes all property within the UWL permit boundary. This JD identified several Waters of the United States (wetlands) that are jurisdictional under Section 404 of the Clean Water Act. The UWL site and appurtenances have been designed to avoid impacts to all jurisdictional areas and as a result, no Department of the Army (404) permit is required. A copy of the USACE's preliminary Jurisdictional Determination letter is included in Appendix I.

2.8.5 Seismic Impact Zone

Missouri Solid Waste regulations promulgated under 10 CSR 80-11.010(4)(B)3 require an evaluation to determine if a proposed landfill site is located in a seismic impact zone. According to 10 CSR 80-2.010(96), seismic impact zone is defined as, "*an area with a ten percent (10%) or greater probability that the maximum horizontal acceleration in lithified earth material, expressed as a percentage of the earth's gravitational pull (g), will exceed 0.10 g in two hundred fifty (250) years*".

The current reference for the expected probability of acceleration for design stability purposes is the 2008 "Documentation for the 2008 Update of the United States National *Seismic Hazards Maps*" generated by the USGS (Petersen et al.) and available from the USGS as Open-File

Report 2008-1128. Reference to the hazard map most closely aligned with 10 CSR 80-2.010(57) is a large-scale map entitled, "*Peak Acceleration (PGA) with 2 Percent Probability of Exceedance in 50 Years*". Review of this map suggests that the proposed landfill site is located in an area where the peak acceleration exceeds 10 percent. Therefore, the site has been determined to be located within a seismic impact zone as defined under 10 CSR 80-2.010(96). A copy of the referenced hazard map can be found as Figure 7 of the DSI report and Figure C-1 in Appendix J.

Available information was reviewed during the DSI process to verify and document that the proposed UWL waste boundary is not located within 200 feet of a fault that has had displacement in Holocene time, in accordance with 10 CSR 80-11.010(4)(B). Review of site-specific geological information, including maps, cross sections, and boring logs, has provided no evidence of Holocene age fault displacement within any of the field exploration locations. In addition, review of available literature describing the regional geology of the site has not identified the presence of faults subject to Holocene age displacement near the Labadie Energy Center property.

2.8.6 Unstable Areas

The proposed UWL property has been evaluated for unstable conditions in previous and recent geotechnical field investigations (Appendix J). The data generated by those investigations was supplemented with other relevant information to determine compliance with the unstable area siting criteria as defined in 10 CSR 80-11.010(4)(B)4. This rule states:

Owners/operators of proposed utility waste landfills located in an unstable area shall demonstrate to the department that the utility waste landfill's design ensures that the integrity of the structural components of the utility waste landfill will not be disrupted. The owner/operator shall consider the following factors, at a minimum, when determining whether an area is unstable:

- *On-site or local rock or soil conditions that may result in failure or significant differential settling*
- *On-site or local geologic or geomorphologic features*
- *On-site or local human-made features or events (both surface and subsurface)*

Unstable areas are further defined in 10 CSR 80-2.010(114) as:

A location that is susceptible to natural or human-induced events or forces capable of impairing the integrity of some or all of the landfill structural components responsible for preventing releases from a landfill. Unstable areas can include poor foundation conditions, areas susceptible to mass movements and karst terrains.

Poor foundation conditions are defined in 10 CSR 80-2.010(77) as:

Those areas where features exist which indicate that a natural or man-induced event may result in inadequate foundation support for the structural components of a landfill.

Areas susceptible to mass movement are defined in 10 CSR 80-2.010(6) as:

Those areas of influence (for example, areas characterized as having an active or substantial possibility of mass movement) where the movement of the earth material at, beneath or adjacent to the sanitary landfill, because of natural or man-induced events, results in the downslope transport of soil and rock material by means of gravitational influence. Areas of mass movement include, but are not limited to, landslides, avalanches, debris slides and flows, solifluction, block sliding and rock fall.

Karst terrains are defined in 10 CSR 80-2.010(49) as:

Areas where karst, with its characteristic surface and subsurface features, is developed as the result of dissolution of limestone, dolomite or other soluble rock. Characteristic physiographic features present in karst terrains include, but are not limited to, sinkholes, losing streams, caves, solution channels or conduits, springs and solution valleys.

On-site or local soil conditions that may result in significant differential settling, including poor foundation conditions and areas susceptible to mass movement, have been addressed by the proposed UWL design. Detailed analysis of the UWL stability is presented in the Geotechnical Engineering Report included in Appendix J. The stability of the UWL slopes was analyzed using both short-term (undrained) and long-term (drained) shear strength properties, and the potential impact of liquefaction of foundation soils.

The minimum static factor of safety (FS) of the completed landfill using long-term strength properties ranged from 1.46 to 2.27, which satisfies the minimum recommended FS of 1.5 considering the conservative assumptions used in these analyses. The "initial" configuration (with 18 feet of CCP in place) was also analyzed using long-term shear strength properties. The minimum FS ranged from 1.47 to 2.70. The minimum FS for failure surfaces along the interfaces of the composite liner was 1.76.

At the locations where the liquefaction analyses indicated a high potential for liquefaction in strata, a residual cohesive shear strength value was input for the liquefied soil stratum. The minimum FS for failure surfaces that intercept the liquefied soil stratum ranged from 1.76 to 2.09 for the initial configuration of the UWL, and from 1.46 to 1.78 for the completed UWL. All are greater than the minimum recommended FS of 1.2 to 1.3. If the assumption is made that liquefaction could occur beneath the completed UWL, then the FS ranged from 1.13 to 1.72. Other analyses demonstrate that liquefaction would not occur beneath the completed UWL. Although a FS of 1.13 is slightly less than 1.2 for this extreme assumption, it is still greater than 1.0 which is standard engineering practice for stability analyses with liquefaction or seismic loading. Therefore, the stability of the UWL is adequate for both intermediate and final configuration, and for both static conditions and when anticipated liquefaction is present.

Seismic analyses were performed in accordance with the 1998 Draft *Technical Guidance Document on Static and Seismic Slope Stability for Solid Waste Containment Facilities* produced by the MDNR Solid Waste Management Program and Timothy Stark, Ph.D., P.E. of the University of Illinois at Urbana-Champaign. The criterion for the seismic stability analyses of a landfill is based upon the estimated lateral deformation or spreading that may occur, rather than a factor of safety against failure with a pseudo-static seismic load (MDNR-SWMP and Stark, 1998). Numerous stability analyses were completed to determine the yield acceleration (K_y) for both the initial configuration and the final or full configuration of the landfill, as well as failure along the interface of the composite liner. The calculated K_y ranged from 0.13g to 0.28g. The proposed geometry of the berm and CCP fill was analyzed in SHAKE2000 for both a short-duration time-history and a long-duration time-history, to determine the estimated cumulative lateral deformation where the K_y of a section is exceeded by the estimated peak ground accelerations in the pseudo time-histories. The maximum estimated cumulative deformation is less than 0.05 inch.

Interior berms are proposed to be constructed using compacted CCP from the existing ash pond. The composite clay liner and drainage layer would extend under the interior berm, to permit extension of the liner and drainage layer for the next cell. The FS for the slope stability of the interior berm was analyzed using the drained shear strength properties of compacted fly ash. The minimum FS for a global circular slope failure and the full height of CCP is 1.91. The minimum FS for a sliding block failure along the extension of the composite clay liner and drainage layer beneath the interior berm is 1.59. The K_y is 0.06g for a sliding block failure along the bottom liner. The calculated cumulative lateral deformation is about 1 inch.

The Missouri regulations for a utility waste landfill (10 CSR 80-11.010) do not specify the maximum allowed deformation. The regulations for a sanitary landfill (10 CSR 80-3.010) stipulate that the cumulative lateral deformation must be less than 6 inches. Therefore, the design of the proposed landfill, both the permanent perimeter slopes and berms and the temporary interior slope and berm, satisfy this requirement.

There are no known springs, caves or sinkholes within one-quarter mile of the landfill site. Rock outcrops are present in the Missouri River bluffs more than one-quarter mile to the south of the UWL. No other potentially significant geologic or geomorphologic features have been identified at this UWL site. No significant on-site or local human-made features or events, either surface or subsurface, are in evidence at the site within the proposed footprint of the UWL.

2.9 Geotechnical Investigations

Reitz & Jens has performed two separate geotechnical investigations at the site. The first investigation was in 2007 prior to the PSI (Appendix 4 of the DSI Work Plan). Eight (8) geotechnical borings were drilled around the anticipated perimeter of the proposed disposal area during this investigation. These exploratory borings ranged in depth from 20 to 104.5 feet. Three (3) piezometers, P-1, P-2, and P-3 were installed and remained in place, and were

utilized in, the DSI process.

The second geotechnical investigation was completed as a part of the DSI field investigation between September 2009 and January 2010. This investigation obtained shallow soil samples and groundwater level information from 97 additional borings that were converted to piezometers, 22 "temporary" geotechnical borings, and 93 Cone Penetrometer Tests within the UWL footprint. A copy of the Geotechnical Engineering Report for the UWL characterizing the on-site soils and surficial materials above bedrock, and evaluating their impact on the UWL design is provided in Appendix J.

Following the DSI field investigation at the UWL site, Reitz & Jens conducted a geotechnical investigation at off-site Ameren Missouri property near the Callaway Energy Center in Callaway County, Missouri. This investigation located and evaluated an off-site source of clay soils in sufficient quantity and quality to construct the soil liner component of the UWL composite bottom liner. Twelve (12) soil borings were completed in the off-site borrow area in Callaway County. A report documenting the findings of sufficient quantities and quality of clay soil materials is included in the geotechnical report provided in Appendix J.

A summary description of the bedrock, soils and groundwater conditions that were identified during the geotechnical investigations are provided below.

2.9.1 Soils

The UWL site is located in the floodplain of the Missouri River. Deposition of soils in a floodplain is dependent on the velocity of the water. As the flood waters slow the larger size particles are deposited first, and then the finer particles. The velocities of the water vary over the floodplain and with each flood as the topography changes. Therefore, soil deposits in a floodplain ("alluvial" deposits) vary both with depth and in horizontal extent. The borings and CPT soundings at the site revealed a typical alluvial stratigraphy.

The surface soils are generally clays and silty clays with scattered seams and layers of low plastic silt, underlain by silts. The thicknesses of these fine-grain deposits ranged from 2 to 13 feet. There is not an overall pattern to the stratification of the upper fine-grain soils, except for the presence of clayey sandy silt at the surface near the southern end. Sandy silts, silty fine sands, and fine sands, generally to depths of 22 to 36 feet, underlie the upper fine-grain soils. These upper sandy soils are generally loose to medium-dense. The upper sandy soils are underlain by fine to coarse, poorly-graded sands (SP), with some silty sands (SM) and gravelly sands at greater depths. These lower sands generally ranged from medium dense to very dense, increasing in density with increasing depth.

The results of the geotechnical investigations and laboratory testing revealed an inconsistent deposition of clay soils and a limited quantity of on-site soils that meet the requirements for clay liner (permeability of 1×10^{-7} cm/sec or less). The relatively high groundwater levels and the poor quality of on-site soil materials relative to clay content will require off-site clay borrow

sources to construct the UWL composite liner system. Approximately 1.75 feet of vegetative cover soils will be stripped from the UWL waste boundary footprint and stockpiled for use in the final cap cover. All other soil materials for construction of the UWL, including the perimeter flood protection berms, will come from off-site borrow sources. Off-site borrow sources will be identified and qualified prior to construction of each UWL phase.

The investigation of the 182-acre off-site clay soil borrow site at the Ameren Missouri's Callaway Energy Center included twelve (12) borings ranging in depth from 14 to 31 feet, with some borings terminating at bedrock refusal. Samples of subsurface soils were obtained at about 2.5-foot intervals in the top 10 feet, and at 5-foot intervals below 10 feet. Generally, the recovered soil samples were classified as CH and CL clay materials with some traces of sand, silt and gravel. The range of liquid limits in the recovered soil samples was 28% to 101%, with an average of 60%. Plastic Indices ranged from 16 to 33. All of the samples had 40% or more passing the #200 sieve. The quantity of available clay soil borrow was estimated for clay soils with a liquid limit greater than 40 that did not have a significant amount of sand and gravel. For purposes of estimating clay soil quantities, the 182-acre off-site borrow site was broken down into five (5) individual borrow areas with a total estimated quantity of suitable liner quality clay soils in all five borrow areas of roughly 4.4 million CY. A 149-acre portion of this off-site borrow site, which can produce an estimated 2.6 million CY of liner quality clay, has been permanently deed restricted to provide the liner quality clay soils for the Labadie UWL.

2.9.2 Bedrock

Because of the thickness of alluvial deposits and depth to solid bedrock, consolidated sediments or bedrock materials beneath the site were not sampled. Three (3) deep borings drilled during the geotechnical investigations indicate that there are strata of sands containing chert, limestone fragments and gravel, with the amount of the gravel-size fragments increasing with depth. The three (3) deep borings hit refusal on limestone boulders or bedrock at depths of 91.5 feet to 107.6 feet. Recent geologic mapping of the Labadie area by DGLS (Starbuck, 2010) indicate that this bedrock unit is most likely the Jefferson City-Cotter limestone formation (reference Figure 3 of the DSI Report).

2.9.3 Groundwater Occurrence

Hydrogeologic investigation of the proposed landfill site has shown that groundwater is present in the sandy soils underlying the site. The sandy soils of the Missouri River floodplains are capable of yielding sufficient quantities of groundwater for the purposes of monitoring and sampling, consistent with the current definition of an aquifer as promulgated under 10 CSR 80-2.010(5).

Piezometric monitoring at the proposed landfill site indicates that the static water level is influenced by stages of the Missouri River. As documented in the DSI, monthly measurements made over the 12-consecutive month time period reveal that the water table elevations ranged

from a maximum of 464.66 feet in P-20 (June 2010) to a minimum of 456.43 feet in P-9 (December 2009) during routine monthly measurements, but supplemental measurements made in select piezometers during the months of April, May, and June 2010 showed a maximum recorded elevation of 468.87 feet in P-9 on May 18, 2010. When topographic differences across the site are considered, actual water depth below ground surface (bgs) typically ranged from two to 13 feet during a given month, but in some instances groundwater rose up to, and in some cases, slightly exceeded ground surface elevation (June 8, 2010 data for P-102, P-155, P-165, P-167, and P-177).

Groundwater levels were relatively uniform across the site during a given monitoring event. The maximum variability recorded was during the month of December 2009 (3.94 feet) and the minimum variability recorded was during the month of May 2010 (0.95 feet). From month-to-month, variability within a given piezometer was greatest in those located in the northwestern part of the site, closest to the Missouri River. It was least variable in those piezometers clustered in the southeastern part of the site, farthest from the Missouri River. Fluctuations in the elevation of the water table are controlled by localized or seasonal variations in the Missouri River stage. Franklin County Land Use ordinances include a definition of the "Natural Water Table" as "The level at which water stands in a fully saturated unconfined aquifer as measured by shallow piezometers or wells. The natural water table is under static hydrologic conditions and uninfluenced by groundwater pumping or other engineered activities". Because the Missouri River is an "open river," the level of the Missouri River and the natural water table at the site is never under truly "static hydrologic conditions." Based on the groundwater elevation monitoring at the site and almost 11 years of daily Missouri River level readings at the Labadie Energy Center, a periodic high "Natural Water Table" at the site was determined to be el. 464 NAVD88 (reference Appendix Z). Overall, when river elevations are relatively high, groundwater movement is generally toward the east and southeast. Conversely, when river elevations are relatively low, groundwater movement is generally to the north and northwest. (refer to the Figures 18 through 29 in the DSI Report for the range of observed groundwater flow gradients). On-site infiltration of precipitation does not appear to have a significant effect on the water table elevation.

Despite the seasonal variability in flow, piezometers and/or groundwater monitoring wells along the western and southern perimeter of the proposed UWL are generally considered hydraulically "upgradient" of waste disposal boundaries. Piezometers along the eastern perimeter of the proposed UWL are generally considered hydraulically "downgradient". Piezometers along the northwest and southeast corners of the proposed UWL perimeter are considered transitional with respect to upgradient/downgradient designations due to the influence by the Missouri River stages. Appendix W(a) provides a summary of hydraulic and hydrologic information relating to groundwater monitoring from December 2009 through November 2010, including groundwater gradients and their fluctuations across the site, and groundwater gradient response to a May 2010 rise in the Missouri River.

2.10 Survey Control

Horizontal and vertical control must be maintained within the permitted boundary of the UWL in order to construct it according to plan. The Missouri State Plane coordinate system (North American Datum 1983, or NAD83) will be used throughout construction for horizontal control. Vertical control has been established for six permanent benchmarks located at the landfill site using North American Vertical Datum 1988, or NAVD88. All references in this report to horizontal coordinates (northings and eastings) are based on NAD83. All references in this report to vertical elevation are based on NAVD88. The general location, northing, easting, and elevation of these control points are shown on the drawings.

Horizontal and vertical control during the construction of new portions of the disposal area will be achieved using a site-based geodetic system that will be referenced to the permanent site benchmarks. Earthmoving equipment will have geodetic monitors to provide continuous horizontal and vertical construction control. Grades and detail features will be checked with hand-held geodetic instruments. However, as required by the current rules and as necessary, temporary alignment stakes and benchmarks consisting of wooden hubs and lath may be placed periodically throughout the landfill during construction. Alignment stakes may be used to visually identify and locate the landfill boundary, drainage channels, roadways, etc. Upon approval of the proposed landfill, the boundaries of the UWL will be marked with steel fence posts or other durable, visible markers at all corners.

The horizontal and vertical survey control established for the project was utilized to design the necessary buffer zones along the property boundaries, the on-site utilities, and Labadie Bottom Road, and to provide future survey control for construction. In addition, field data points utilized in the hydrogeologic investigation were surveyed to provide accurate documentation and interpretation of the results.

2.10.1 Boundary Survey

The survey plats and easement legal descriptions for the Utility Waste Landfill Permit Boundary and Utility Waste Boundary are found in Appendix V. Included in this information are all existing known easements, benchmarks and survey control points. Control point information is included on the drawings.

2.10.2 Permanent Survey Control Points

Six (6) permanent horizontal and vertical survey control points have been established around the perimeter of the UWL waste boundary by a registered Professional Land Surveyor, and are shown on the survey plat provided in Appendix V. The locations and elevations of each of the control points are shown on the accompanying drawings.

3.0 LANDFILL DESIGN

This section outlines the design and construction details for the UWL that are required by the State regulations and applicable Franklin County ordinances. The set of 23 drawings, provided as a separate document, provides further graphical detail and support for the design and construction narrative details provided in this section.

In the spring of 2009, Ameren Missouri requested a PSI for a proposed UWL site east of the Labadie Energy Center on an Ameren Missouri owned tract of land of 1,000 plus acres with a proposed UWL footprint of about 400 acres. Following the approved PSI, Ameren Missouri proceeded in accordance with state law, rules and guidance to conduct a DSI site investigation of the proposed UWL site with a footprint of about 350 acres. The DSI was conducted from September 2009 through December 2010 and results approved by the state Geological Survey Program in April 2011. This engineering report and supporting permit design plans and associated documentation make up the formal UWL Construction Permit Application (CPA) for a 166.5-acre waste utility waste disposal area within an 813-acre UWL permit boundary.

The proposed utility waste disposal area will use a conventional UWL area disposal method for dry landfill disposal of CCPs consisting of fly ash and bottom ash produced by the Labadie Energy Center and stored in the existing ash holding ponds, and disposal of byproducts from the plant's future FGD systems. The fly ash, bottom ash, and FGD byproducts will all be dewatered as necessary to pass the paint filter test prior to being transported to the UWL for conventional dry disposal.

Initially, Ameren Missouri anticipates using the permitted UWL for the dry landfill disposal of dewatered fly ash and bottom ash from the plant's existing plant ash ponds and fly ash and bottom ash produced in the future. Additionally, Ameren Missouri will include the disposal of the plant's FGD byproduct waste. The waste CCPs will initially be transported from the power plant by truck to the permitted UWL for disposal.

In addition to the required state permits and approvals for the UWL, Ameren Missouri has obtained or is currently pursuing all applicable Franklin County approvals.

3.1 Description of Landfill Design

The design, construction and operation of the UWL are predicated on the concepts required to implement the conventional dry UWL landfill disposal process for CCPs as defined in the current state rules. The 166.5-acre waste boundary has been divided into Phases 1, 2, 3 and 4 to manage fly ash, bottom ash and FGD byproducts, along with the disposal of other CCPs and solid wastes allowed by regulation.

The UWL design, construction and operation described in this report will primarily utilize those techniques outlined in 10 CSR 80-11.010 for the design and/or operation of the UWL.

However, the site conditions require a design that will result in intermittent contact of a small percentage of the constructed bottom liner (primarily at the sumps) with the alluvial groundwater. As allowed by 10 CSR 80-11.010 (1), detailed discussion provided in Appendix Z, portions of the text of Sections 3.0 and 4.0, and details provided in the drawings, provide a demonstration that the design and operational techniques for UWL are based on sound engineering judgment and will meet or exceed the minimum requirements of 10 CSR 80-11.010.

Phase 1 has been designed to provide CCP disposal capacity for slightly over five (5) years at the currently projected generation rates, with the estimated startup of FGD systems generating additional CCP wastes in 2021. Subsequent Phases 2, 3 and 4 have been designed to provide additional disposal capacity in minimum five-year increments. The actual size of the constructed disposal areas for Phases 2, 3 and 4 will depend on future CCP generation rates, but it is anticipated that these phases will also be developed in minimum five-year increments until the entire permitted area is developed and filled to capacity.

The major design components of the proposed UWL are summarized as:

1. A composite liner system proposed for all Phases will include a compacted clay liner (24-inch minimum thickness) with maximum permeability of 1×10^{-7} cm/sec overlain by a 60mil thick HDPE geomembrane liner.
2. The final cover system for the UWL will include a 40 mil thick HDPE geomembrane overlain by a 24-inch soil cover to support a hardy stand of vegetation, except at the perimeter ditch that includes a 40 mil thick HDPE geomembrane overlain by a 12-inch soil cover.
3. A leachate collection system designed to minimize the hydraulic head on the bottom composite liner to less than 12 inches will be included in all Phases.
4. The final cover on the UWL will have a minimum slope of 1%, but will more generally be a minimum of approximately 2%.
5. The stormwater management system is designed to prevent the discharge the 25-year, 24-hour storm event from the UWL to waters of the state during the active operations. The system allows for re-use of all leachate and contaminated stormwater to the extent practical on-site for dust control, conditioning CCPs prior to placement and makeup water for future scrubber operation. Excess water will be pumped to the power plant and managed through the plant's NPDES permit. If necessary, off-site transport and wastewater treatment may be considered.
6. The groundwater monitoring system for the UWL consists of multiple upgradient and downgradient monitoring wells that will provide representative samples of the groundwater for detection monitoring of the UWL during the active operations and

following UWL closure.

3.1.1 Project Background Summary

Ameren Missouri retained Reitz & Jens, Inc. (RJ) to assist with the preparation of the UWL CPA after completion of the PSI and DSI. RJ retained GREDELL Engineering Resources, Inc. (GER) to assist with the design and permitting of the UWL in accordance with state agency requirements.

The requirements of 10 CSR 80-11.010 are based on the dry tomb concept of landfill design and operation. The proposed UWL design and operation have been developed in accordance with conventional UWL requirements and general engineering practice.

3.1.2 Technical Background Summary

The UWL is proposed for the long-term management of all utility wastes produced by Ameren Missouri's Labadie Energy Center, including bottom ash, fly ash and FGD byproducts. Currently, Ameren Missouri manages bottom ash and fly ash from the Labadie Energy Center in on-site ash ponds permitted under an NPDES discharge permit issued by the Water Pollution Control Program of MDNR. Off-site beneficial use of the CCPs is encouraged whenever possible.

Traditionally, UWLs have been used in Missouri for the management of fly ash, boiler slag and bottom ash, with much information being published about these traditional coal combustion products or CCPs. Generally, the chemical constituents in these CCPs originate from the fuel source, or coal, and are primarily inorganic compounds following the combustion process.

When installed, the future FGD system at the Labadie Energy Center will operate "downstream of", or following, the fly ash and slag removal processes.

3.1.3 Environmental Protection

The majority of the subsections of 10 CSR 80-11.010 are intended to prevent the construction and operation of a utility waste disposal area that negatively impacts the quality of the surface water, groundwater or air within a certain zone of impact surrounding the disposal area. All federal and state environmental regulatory programs allow small, regulated releases to the environment (e.g., groundwater, surface water or air).

Routine wastewaters generated from the leachate collection system and direct precipitation on the UWL area will be managed as a closed loop system. Precipitation on the UWL will be collected and routed to stormwater ponds. The ponds will collect stormwater runoff from the perimeter ditches around the UWL and, combined with the leachate collection system, will form a water management system that will contain, temporarily store and process all waters within the active UWL for reuse or proper management. Leachate and stormwater will either be used

for dust control within the UWL area, conditioning to achieve appropriate moisture content for CCP materials prior to placement, and/or makeup water for future scrubber additions to the plant. To the extent wastewater quantities exceed these management options, discharges from the leachate and stormwater system will be managed through the Ameren Missouri Labadie Energy Center NPDES permit or may be disposed off-site. EPA currently plans to issue revisions to the Steam Electric Effluent Guidelines in May of 2014. These regulatory revisions may influence how leachate and stormwater are managed at the site. Future regulatory revisions are anticipated throughout the 24-year projected life of the UWL which will require ongoing adaptive management of the leachate and stormwater management system based on data obtained during the UWL operation.

The requirements of 10 CSR 80-11.010(12), as they pertain to air quality protection, relate primarily to minimizing fugitive dust emissions from the utility waste disposal area. By nature of the UWL disposal process moisture conditioning of the CCPs minimizes fugitive dust emissions during the transportation, placement and compaction of the CCP solids.

3.1.4 Compliance with 10 CSR 80-11.010

Prior to the addition of the FGD, the primary CCPs produced by the Labadie Energy Center will be approximately 70% fly ash and 30% bottom ash. As defined in 10 CSR 80-2.010(118), utility waste includes "...fly ash waste, bottom ash waste, slag waste and flue gas emission control waste generated primarily from the combustion of coal or other fossil fuels." A permit modification will be submitted if any future utility wastes other than those in the current definition will be disposed of in the UWL. In accordance with 10 CSR 80-11.010(2)A, "clean fill", as defined by 10 CSR 80-2.010(11), may also be accepted for disposal in a permitted UWL. The disposal area method of UWL construction and operation will be followed to allow for the disposal of utility waste as defined in 10 CSR 80-2.010(118).

The UWL will be constructed in phases as shown in Sheet 5 of the plans. In general, the development and construction of the phases will proceed in numerical order. Phases 3 and 4 will follow the completion of Phases 1 and 2. Phase 2 will require the relocation and/or vacation of Labadie Bottom Road. Phases 3 and 4 will require the construction of access roads across the Explorer pipeline, as shown on Sheet 10.

The UWL disposal areas are designed in accordance with the minimum requirements of 10 CSR 80-11.010 and include a composite liner system and leachate collection system to allow leachate to freely drain by gravity from the in-place CCPs. All leachate generated by the UWL will be managed as described in Section 3.1.3. The CCPs managed in the UWL will be moisture conditioned to minimize dust during handling, hauling, unloading, spreading and compaction operations. The CCPs will be delivered to the UWL by vehicles that will access the UWL from the plant access road. The surface of the UWL access and internal haul roads will be stabilized to further minimize dust. Additional details are provided in subsequent sections of this

engineering report to describe and demonstrate how the landfill is designed and will be operated to meet current environmental protection requirements.

The area method of landfill operation will be used in the UWL disposal process with one exception. The use of intermediate cover will be in accordance with 10 CSR 80-11.010(14)(C)1, which states, "Cover shall be applied at a total thickness of at least one foot (1') of compacted soil on filled areas of the utility waste landfill which are idle for more than sixty (60) days, and on all final side slopes at the end of each filling sequence." Instead of burying intermediate cover under landfilled CCPs, the intermediate cover will be removed and reused in other areas of the UWL when operations restart in an idle area where intermediate cover has been applied. Intermediate soil cover shall be applied and nominally compacted to a total thickness of at least one (1) foot. Temporary vegetation will be established for erosion control until final cover is installed on all final side slopes at the end of each filling sequence. The largest area anticipated to require intermediate cover at any one time is 57 acres, which is the size of the largest cell (Cell 3). The estimated volumes for intermediate soil cover for the soil balance (reference Appendix K) are based on a maximum of 57 acres requiring intermediate cover at any one time and the reuse of intermediate soil cover.

CCPs generated at the Labadie Energy Center will be transported to the UWL on an all-weather access road constructed to a minimum elevation of 486 and designated as the CCP haul route. The access road will include an overpass for crossing over the existing Labadie Bottom Road. The method of transportation is by truck. The proposed access road from the plant to the western boundary of the UWL is shown on Sheet 5 of the plans. CCPs will be loaded on haul trucks at the plant or excavated from dewatered portions of the existing ash ponds south of the plant and hauled to the active phase of the UWL without leaving Ameren Missouri property, or traveling on public right-of-ways.

The fly ash and bottom ash will be moisture conditioned (either dried or moistened) to optimize the handling characteristics during placement in the UWL. The fly ash and bottom ash will be moisture conditioned on the plant site as a part of the Labadie Energy Center operations. As required, CCPs may be further moisture conditioned in the UWL by adding leachate and/or stormwater at the active disposal area. Other methods of conveying CCPs from the plant to the UWL may be implemented in the future.

The access road will allow trucks all-weather access from the plant to the active UWL areas. Once inside the active disposal area, temporary access roads will be constructed on the previously disposed CCPs in appropriate locations to allow truck access to the active working face. Once inside the solid waste disposal area, the trucks will unload the CCPs at the active working face of the UWL.

Access of loaded trucks to the UWL will be tightly controlled. Since the utility waste accepted for disposal will only be from the Labadie Energy Center, the likelihood of unacceptable wastes

being disposed in the UWL is minimal. A landfill equipment operator will be on-site when necessary to receive, spread and compact the CCPs at the active working face. As trucks approach the active working face and prepare to unload, the equipment operator will visually inspect and screen the material for unacceptable waste materials. Trucks containing unacceptable waste will not be allowed to unload at the UWL. Unacceptable waste discovered at the working face will be sorted, temporarily stockpiled, and loaded onto trucks for return to the plant where they will be managed in accordance with current plant solid waste disposal practices.

The UWL disposal areas have leachate and stormwater collection and management systems to manage and remove accumulations of leachate and stormwater in a timely manner to maintain a dry operation. Utility wastes will not be unloaded or placed in standing water inside the disposal area.

3.2 Volume of the Proposed Landfill

The total volume of landfill airspace is estimated to be 16.5 million CY (cubic yards) based on the top of liner and final grade plans shown on Sheets 5 and 10, respectively. The 2-foot thick final cover is estimated to require approximately 537,200 CY of this airspace. The 1-foot thick leachate drainage layer and the 1-foot thick protective cover volume are estimated to occupy a total of 505,100 CY of airspace. This leaves a total net estimated 15.5 million CY of airspace available for CCP disposal. Appendix L includes supporting details regarding landfill volume calculations.

3.2.1 Landfill Life Expectancy

CCP generation and disposal requirements at the Labadie Energy Center will vary based primarily on the amount of power generated, type of coal burned, and amount of CCPs that can be beneficially reused. Ameren Missouri has estimated the maximum quantities of CCPs that will need to be disposed of in the UWL every five years. Due to the projected start-up of FGD scrubbers, the 5-year disposal rates are estimated to increase slightly every five years for the first 10 years and then remain steady for the foreseeable future. Using the estimated 5-year CCP disposal rates, the calculated life expectancy of the landfill is approximately 24 years. Appendix L includes details further supporting the estimated landfill life calculations.

3.2.2 Soil Material Volume

A sufficient quantity and type of soil materials for landfill construction and operation are not available within the landfill footprint or in adjacent non-jurisdictional areas within the 813-acre UWL permit boundary. Instead, 1×10^{-7} clay soils for the UWL liner will be obtained from the off-site borrow area at the Callaway Energy Center site. A March 2011 geotechnical investigation of the Callaway Energy Center site determined that this borrow source contained at least 2.6 million CY of 1×10^{-7} clay soil. The amount of clay needed is approximately 537,200 CY for the

UWL composite bottom liner and approximately 101,800 CY for the stormwater pond composite liner (total = 639,000 CY).

Since there is not sufficient soil to build the landfill bottom, the perimeter berms and intermediate cover within the UWL permit boundary, Ameren Missouri will provide these soils from off-site borrow sites through construction contracts as each disposal cell is built. (Reference Appendix K for quantity estimates of the various soil materials required). The off-site soil borrow areas will be reclaimed in accordance with 10 CSR 80-11.010(14)(C)9, with final slopes no steeper than 3:1 (H:V) and revegetated surfaces unless they are developed as ponds or lakes. The soil balance calculations estimate that 639,000 CY of 1×10^{-7} -clay and 2.6 million CY of heterogeneous fill soils are needed to construct the bottom, perimeter berms and intermediate cover for all four (4) phases of the UWL.

Up to 1.75 feet of vegetative soil will be removed from the footprint of the landfill and the stormwater ponds as part of the site clearing and grubbing. This material will be stockpiled for use as vegetative soil cover in the final cap and perimeter berms. Seasonal groundwater levels at the site vary with the Missouri River level, but the natural water table, as demonstrated in Reitz & Jens' design basis memorandum dated April 9, 2012 (reference Appendix Z), is defined as elevation 464, which was used for design purposes. This elevation is within a few feet of the existing ground surface within the footprint of the landfill, which limits the amount of excavation that is proposed for construction of the UWL. Therefore, off-site borrow soil for engineered fill is needed to raise the UWL footprint to the design bottom subgrade prior to construction of clay component of the composite bottom liner system.

After issuance of the construction permit, an easement and access agreement to the UWL permit boundary will be executed between the Ameren Missouri and MDNR-SWMP. A draft of the easement is included in Appendix R, Closure and Post Closure Plan.

3.3 Construction Sequence

Throughout the life of the UWL, there will be intermittent periods of construction for the UWL disposal areas. CCP disposal will be conducted in distinct and separate areas until the last few years of the operational life of the UWL, at which time the disposal may occur on parts of two phases to achieve the final grades shown on Sheet 10. CCP disposal will occur in four (4) Phases (1, 2, 3 and 4). The disposal process will concentrate on first filling each phase with CCPs to approximate elevation 478.5 and then proceed in a controlled manner to minimize the size of the working area and manage stormwater runoff within the disposal area until grades reach those shown on the plans. The UWL design utilizing multiple sumps and drainage areas within each Phase allows for the independent construction of each Phase or portions thereof as needed for CCPs disposal. CCP disposal in Phase 1 will generally start in the northwest corner and proceed from west to east then north to south. CCP disposal in Phase 2 will generally occur from west to east. CCP disposal in Phase 3 will generally occur from northwest to

southeast. CCP disposal in Phase 4 will generally start on the north edge of this phase and proceed to the south.

3.3.1 UWL Construction Sequence

The initial Phase 1 (31.4 acres with a 5.7-acre stormwater pond) disposal area is sized and designed to provide approximately 5 years of disposal capacity minimum at current projected CCP generation rates. Phases 2 (35.2 acres), 3 (57.1 acres, with a 4.4-acre stormwater pond) and 4 (42.8 acres, with a 3.4-acre stormwater pond) are designed to allow the development of disposal cells that will provide approximately 5 years of CCP waste disposal capacity. A perimeter berm will be built around the constructed portion of each Phase or disposal cell to provide flood protection from Missouri River. The perimeter berms, composite liner, and leachate collection system for Phases 1, 2, 3 and 4 will each be built as individual disposal cells. However, the size of each future disposal cell will be further evaluated during the operation of the UWL prior to construction using refined estimates of future CCP disposal rates. Additional discussion of design, construction and operation of the disposal phases is provided in subsequent sections of this report.

3.3.2 UWL Disposal Area Construction Sequence

Phase 1 will be the first UWL disposal area constructed and will be constructed as one disposal cell. The construction sequence for additional phases and individual disposal cells, as well as the overall sequence for Phases 1 through 4, is described in Section 3.3.2.1. The method used to mitigate the potential uplift pressure impacts on the bottom liner in the unlikely event of a significant flood is described in Section 3.3.2.2. Section 3.3.2.3 describes the use of Fabric-Formed Concrete Mat (FCM) to address Franklin County's requirement for perimeter berm construction.

3.3.2.1 Phase Construction Sequence

Each lined portion of the disposal area will be enclosed by both permanent exterior perimeter berms and temporary interior perimeter berms constructed to elevation 488 to provide protection from the 100-year flood event with at least 3 feet of freeboard. The core of the permanent exterior berms will be constructed with engineered soil fill and the exterior slope will be covered with FCM. The interior slope is integral to the UWL disposal area and will be lined with a composite liner and leachate drainage layer.

The lined disposal cell of an active phase will be separated from future, contiguous unlined disposal cells by the temporary interior berm constructed to elevation 488. Interior berms will be installed between Phases 1 and 2 and Phases 3 and 4 that will ultimately be covered with CCPs. The interior berm divides and fully encloses the lined disposal cell from the unlined, future disposal cells and provides flood protection during the operation of the active disposal cell. The interior berm also protects the shared edge of the active disposal cell's composite liner

and leachate drainage layer until the next disposal cell (including exterior and interior berms, composite liner and leachate collection system) is constructed. The interior berms will be constructed using compacted, moisture conditioned CCPs as the core, with the UWL composite liner and leachate drainage layer extending beneath the CCPs. The exterior slope of interior berms will be covered with FCM. The interior slope of the interior berm will be uncovered to promote internal drainage within the disposal cell. Each disposal cell will be fully enclosed with perimeter berms prior to initial active disposal operations. When the disposal cell is filled with additional CCPs during operations, the CCPs used for the interior berm core will be indistinguishable from the moisture conditioned CCPs placed in the active disposal cell. No CCPs or stormwater run-off that has come in contact with CCPs will be managed in the unlined portion of the UWL.

When the active disposal area is filled to approximately 70% of its capacity, the next disposal cell will be constructed, including the interior and exterior berms, composite liner system and leachate collection system, allowing the next disposal cell (as identified by numerical order) to be fully enclosed with perimeter berms prior to operation.

As Phase 2 and 4 are developed, the exterior berms will be extended to enclose the new disposal cells. The interior berm segments between Phases 1 and 2 and Phases 3 and 4 are designed to be left in place, and the composite liner and leachate collection system will be extended under the interior berms in each new disposal cell to provide a continuous bottom liner and leachate collection system. Other than construction of the interior and exterior berms, the construction sequence of the disposal areas is typical of the area method of landfill operation.

3.3.2.2 Flood and Liquefaction Impact Mitigation Plans

The UWL's location in the floodplain of the Missouri River requires construction of berms to elevation 488.0 to protect the active CCP disposal operations from potential flood events. The current Flood Insurance Rate Map (FIRM) for this area shows the regulatory 100-year flood elevation at the site (Approximate River Mile 57) to be about 484. The land surrounding the UWL is currently protected from Missouri River floods first by the Labadie Bottom Levee District's agricultural levee and the mass fills for the Labadie Energy Center to the west. The plant and ash pond fills are higher than the 500-year flood elevation, effectively protecting the UWL from Missouri River flood flows from the west (upstream). The agricultural levee along the Missouri River north of the UWL also protects farmland from regular flooding up to approximately elevation 480. The interior and exterior perimeter berms, with a top elevation of 488, are a second protective measure against flooding and effectively protect the UWL from Missouri River flood events greater than a 100-year return frequency. (Reference Section 2.8.3 for additional information on floodplains and flood elevations.)

During construction and initial operation of each Phase (or portion thereof), the lowest elevation

of the top of bottom liner is no more than 20 feet below the 100-year flood elevation (approximate elevation 484). In the unlikely event that floodwaters surrounding the perimeter berms exceed the bottom liner elevation, the elevation differential creates potential uplift pressure on the bottom liner. Unmitigated, this pressure could damage the composite liner. However, 'ballast' placed on top of the composite liner will effectively counterbalance and mitigate the potential uplift pressures during a flood event.

To protect the composite liner from potential uplift damage, no more than 5.5 feet of differential hydrostatic uplift pressure can be allowed between the inside and outside of the berms (reference Appendix J). In-place CCPs will effectively provide the required ballast and are denser than water (estimated in-place CCP density is 93 pounds per cubic foot). Therefore, when in-place waste reaches a minimum elevation of approximately 478.5 the weight of the CCPs will sufficiently counter balance and mitigate the uplift pressures that may result from the 100-year flood at elevation 484.

The Missouri River floodwater is expected to rise at a rate of no more than 5 feet (elevation) per 24 hours. Therefore, the majority of the CCP ballast must be in place before the pressure difference reaches the maximum 5.5-foot differential. Cell 3 is the largest disposal cell at 57.1-acres, but is approximately 51.3 acres at el. 480. Upon completion of construction, it is conservatively estimated to require 578,000 CY to fill the cell to elevation 478.5. At a CCP placement rate of 10,000 CY per day, it will take approximately 58 days to fill Cell 3 to elevation 478.5.

The most practical and effective way to ensure the required CCP ballast is in place prior to the unlikely event of a major flood is to fill each disposal area to elevation 478.5 as soon as practical following the issuance of the operating permit. Flood events at this location on the Missouri River are generally predicted several weeks in advance which allows the placement of CCP ballast to begin as soon as major flooding is predicted. In the event of an extreme emergency, the disposal area will be flooded with non-potable water to prevent uplift damage to the liner.

Appendix Y provides calculations and tables that estimate the amount of time it will take to fill all of the disposal cells to elevation 478.5 to prevent uplift of the constructed liner during a 100-year Missouri River flood. These calculations indicate an alternative operating procedure could be required if the Missouri River is predicted to flood during the initial operation of a newly constructed disposal cell. As stated in Appendix Y, the calculations have been completed using a maximum, average CCP disposal rate of 10,000 CY per day. With an adequate stockpile of CCPs in the Labadie Energy Center ash ponds or in previous UWL phases, five (5) pieces of equipment pulling two, 20 CY pan scrapers each working a double shift, are capable of moving more than 10,000 CY of CCP per day to provide this required liner uplift protection.

This approach will be used for each disposal cell development during periods of predicted

flooding up to the 100-year event until sufficient CCPs are placed within the constructed UWL area to counterbalance floodwater uplift. As soon as composite liner has been installed in a new phase or disposal cell and the new area has approved for CCP disposal, stockpiled CCPs will be moved from an adjacent phase or cell into the newly approved area at a rate necessary to achieve a minimum elevation of 478.5 prior to the next predicted flood event. Implementation of these flood mitigation practices is most critical during the initial operation of Cell 1 due to the lack of stockpiled CCPs in an adjacent disposal cells. Implementing these flood mitigation practices during the initial operation of Cells 2, 3 and 4 will be less critical due to the anticipated availability of large quantities of CCPs in adjacent phases of the UWL. Once the in-place waste reaches a minimum elevation of 478.5, the CCP disposal rate will be determined by the CCP generation rate and storage capacities at the plant.

A procedure to mitigate the potential impact of a future flood on the composite liner in the stormwater ponds is also required. The water levels within the stormwater ponds will routinely fluctuate over the operational life of the UWL based on storm events, the water demands of the UWL and Labadie Energy Center. The bottom elevation of the stormwater ponds is el. 468 and the operating level of the stormwater ponds will fluctuate between a minimum el. 471 and a maximum el. 482. To protect the composite liner from potential uplift, no more than 3.3 feet of differential hydrostatic uplift pressure will be allowed between the inside and outside of the berms (reference Appendix J). During a 100-year flood event (el. 484), the water level in the stormwater ponds must be maintained at el. 480.7 or higher to mitigate potential impacts to the composite pond liner.

To address the potential situation where the water level in the ponds is less than the required el. 480.7, water will need to be rapidly provided to the ponds to prevent damage to the composite pond liner. This will be accomplished by installing one, 24-inch culvert pipe at approximate el. 472 through the perimeter berm of each pond to allow flood water to rapidly flow into the ponds. Each pipe will have a gate and check valve to prevent discharges from the pond during normal operating conditions. During a predicted significant flood event and once the elevation of the flood water against the exterior of the pond berm exceeds el. 473 the gate valves will be opened allowing the water inside the pond to equalize with the flood elevation on the perimeter berm exterior. Appendix Y provides additional descriptions and calculations supporting the design of this stormwater pond flood impact mitigation system.

Flood events along the lower Missouri are typically seasonal and predictable weeks in advance. The exact timing and time frame for moving CCPs into the newly constructed areas is dependent on many factors that will be monitored and evaluated whenever a new area is built. The need and schedule for placing ballast fill (CCPs) in an area will be different, depending on the timing of the area's completion and the predicted timing or potential for floods during the initial month of disposal area operation. Missouri river flood forecasts are readily available on the internet via the US Army Corp of Engineer's website and other sources. River level gauging stations are located above and below the Labadie Energy Center. The landfill operator and

Labadie Energy Center Operations personnel will monitor the stage on the river on an ongoing basis. This will include monitoring short-term and long-term flood stage forecasts to manage UWL disposal area development and CCP disposal rates to effectively counterbalance and mitigate the potential uplift pressures on the landfill liner systems throughout the operating life of the UWL.

As determined in Section 2.8.5, the UWL site is located within a seismic impact zone. Before sufficient fill has been placed to eliminate the risk of liquefaction, there is a slight risk of damage to the partially completed berms and composite liner that could result from the lateral spreading, settlement or formation of sand boils. The minimum threshold ground acceleration for this potential situation is 0.10g. Therefore, if a seismic event would occur with a ground acceleration greater than 0.10 g before sufficient berm or CCP fill had been placed, then an investigation will be completed to determine whether the composite liner has been damaged. This condition is discussed in more detail in Section 6.1.3 of Appendix J.

This investigation will be completed in stages. The initial stage will consist of an topographic survey of the perimeter berms in those areas indicated in Figure D-3 of Appendix J, as being potential areas of liquefaction. The survey will determine whether settlement or lateral movement has occurred. Also, the area outside of the perimeter berms will be visually examined for evidence of settlement, lateral movement and/or sand boils. If there is evidence of liquefaction from the initial investigation, then the bottom composite liner will be surveyed in the adjacent storm water pond, to compare with the final survey of the completed liner.

Under these circumstances, the composite liner in the adjacent storm water pond will also be examined for damage. If there is evidence of heave (due to sand boils), differential settlement or damage to the liner, then the final stage will be to remove CCP in the affected area of the cell to examine the composite liner for similar evidence of damage. Any damaged area of the composite liner will be removed and replaced.

3.3.2.3 Franklin County Requirement - Erosion Protection

Franklin County's Unified Land Use Regulations were amended on October 25, 2011 to include a requirement that all UWL cells be protected by an exterior berm meeting the following criteria:

- The top of the berm at the minimum shall be equal to the five hundred (500) year flood level in the area of the proposed Utility Waste Landfill; and
- All berms shall be constructed of concrete or cement-based material sufficiently thick for the purpose intended and approved by the Independent Registered Professional Engineer.

Reitz & Jens' design basis memorandum dated April 10, 2012 defined the purpose intended of the berms to be providing erosion protection for exterior berms that will potentially be exposed

to future flood events. This design basis memorandum is included in Appendix Z. The Franklin County requirement will be met by installing fabric-formed concrete mats (FCM) on the outside slope of the exterior berm using manufactured fabric forms and cast-in-place concrete. FCMs will be installed on the exterior slopes of disposal cells and the exterior slopes of the stormwater ponds. Calculations included in Appendix G of Appendix J demonstrate that a nominally thick (2.2-inch) FCM will provide adequate protection against the maximum anticipated flood water velocities. Sheet 19 provides typical details for the use of FCM on the exterior berms.

3.3.3 Phased Development

10 CSR 80-2.010(74) defines 'phased development' as "...the division of the construction and operations of a solid waste disposal area permit into two or more distinct phases in order to facilitate more orderly construction, operation, closure and/or post-closure care of the solid waste disposal area...". The proposed UWL has been designed in four (4) cells, requiring four (4) phases of development for the following reasons:

1. Phased development minimizes the initial site development and construction costs.
2. Phased development allows the landfill operator to evaluate the effectiveness of the ongoing landfill design and operation, provides intermediate stopping points, and allows alternative disposal options to be evaluated.
3. Phased development allows the owner/operator to minimize the total amount of the financial assurance instrument for closure and post-closure costs.

The initial phase (Phase 1) is 31.4 acres and will be constructed in the west portion of the project area. It will include a 5.7-acre stormwater pond. The remaining Phases or portions thereof will be built only when needed to provide for additional disposal capacity. For the general purpose of permitting the development of the UWL, construction of each succeeding Phase is expected to begin when the active disposal area is approaching 70% capacity. The transition of the composite liner system between disposal Phases is shown in typical details on the plans accompanying this engineering report. The exterior toe of the interior berm that separates the leachate collection system in the lined disposal area from unlined areas will be removed to allow tie in to the clay and geomembrane components of the liner system being constructed for the subsequent cell. The clay and geomembrane composite liner at the existing termination point will be carefully exposed to allow the subsequent disposal area's composite liner components to be constructed and welded together to form a continuous liner system within and between UWL Phases 1 and 2 and Phases 3 and 4. CQA verification testing and documentation will be completed along the sub-area liner and leachate collection system tie-in using the same procedures required for the composite liner components and leachate collection system within each disposal area. This method will create a continuous liner under all contiguous phases of the UWL.

The stormwater holding ponds will be permitted through the SWMP. The exact timing of the construction of the second and third proposed stormwater ponds will be evaluated throughout the operating life of the UWL. Generally, Pond 1 will be constructed with Phase 1, Pond 2 will be constructed with Phase 3, and Pond 3 will be constructed with Phase 4. As needed, the three stormwater holding ponds will be available for use during site closure and post-closure care. Although not required, the ponds have been designed with a composite liner system equivalent to the liner system of the UWL. All water collected in the stormwater ponds will be used as described in Section 3.1.3.

Phased closure will be utilized for the development, closure and post-closure to reduce the amount of the Financial Assurance Instrument (FAI) to the size of the constructed landfill footprint at any point in time. Four distinct phases of landfill development are proposed. No more than two of the four phases are expected to be active simultaneously to minimize closure cost financial assurance. Estimated closure and post-closure costs have been calculated for each distinct phase and for the landfill as a whole. Closure and post-closure activities for the landfill will begin as each phase of the landfill approaches the maximum proposed grades shown on Sheets 10, 11, 12, 13 and 14.

3.3.4 Excavation to Proposed Subgrade

Initial site development will include clearing and grubbing topsoil and vegetation remaining from previous agricultural activities. Approximately 1.75 feet of soil will be removed below existing ground surface and stockpiled within the UWL footprint, outside of all jurisdictional areas, for final cover. This stockpiled final cover closure material will be dedicated for use only as final cover closure material and dedicated for use by the department for that purpose. The final bottom-grading plan to the finished top of the composite liner for the UWL is shown on Sheet 5. Subgrade for the base of clay liner construction will be two (2) feet below the elevations shown on the drawings. The clearing and grubbing will extend beneath the perimeter berms to maximize the available on-site vegetative soil borrow and provide an adequate subgrade for construction of the berm and UWL. Approved soil materials will be used to bring the UWL subgrade to two feet below the top of liner elevations shown on Sheet 5.

The cross sections shown on Sheets 22 and 23 generally depict the vertical depth of excavation and fill. An average of approximately five (5) feet of fill will be needed above the existing ground surface to grade the site to subgrade for the construction of the composite liner system.

3.3.5 Miscellaneous Construction

Construction of stormwater ponds, pump stations, discharge pipes and stormwater channels will be required at different stages of the landfill development to assure the environmental integrity of the UWL.

The perimeter access roads and entrances for the UWL will be constructed of crushed

limestone aggregate. The surface of the UWL access and haul roads will be stabilized to control dust.

3.4 Final Contours

The final contours and grading plan are shown on Sheet 10 at a scale of 1" = 300' and five (5) foot contour intervals. Intermediate final grading contours for Phases 1, 2, 3, and 4 are shown on Sheets 11, 12, 13, and 14, respectively, at a scale of 1" = 100' and five (5) foot contour intervals. The horizontal and vertical extents of the proposed landfill are designed to maximize the use of the proposed site within the area bounded by Labadie Bottom Road on the west and Davis Road on the east, and to avoid impacts to the Missouri River floodplain to the north and jurisdictional wetlands. The site will be filled to a maximum elevation of 565 feet (top of final cover). The solid waste boundary (e.g., horizontal limit of solid waste disposal) will be a minimum of 100 feet from all existing property boundaries and any adjoining road right-of-way, with the exception of Labadie Bottom Road, which will be relocated prior to the construction of Phase 2.

The height and final slopes of the landfill were designed to maximize runoff and stability while minimizing erosion of the final cover (see Erosion Calculations in Appendix M). A maximum slope of 33% (3:1; horizontal: vertical) is used on the UWL side slopes. The top of the UWL will be crowned with an approximate 2% top slope, which exceeds the minimum slope of 1% required by regulation.

Surface water diversion berms and letdowns are designed to control runoff and minimize erosion. Temporary riprap lined letdown structures will be located around the perimeter slopes of the active phase of the UWL to convey runoff to the perimeter ditch at the base of the UWL slope. Ultimately, these structures will be replaced with permanent riprap lined letdown structures for use as stormwater letdowns to manage uncontaminated runoff from the closed UWL.

The perimeter ditch will be constructed at elevation 483 inside the top of the perimeter berm and within the UWL disposal boundary. The perimeter ditch and the bench at approximate elevation 520 are part of the overall stormwater management plan for the UWL.

3.5 Solid Waste Accepted

The UWL will accept allowable CCPs as defined in 10 CSR 2.010(118). By this definition, CCPs (utility waste) includes fly ash waste, bottom ash waste, slag waste and flue gas emission control waste generated primarily from the combustion of coal or other fossil fuels. This definition includes utility wastes such as moisture conditioned (dewatered and passing the paint filter test) dry FGD byproducts, fly ash, bottom ash, slag and other CCP wastes. As provided in 10 CSR 80-11.010(2)A., clean fill may also be accepted. Fly ash and bottom ash from the Labadie Energy Center are currently managed in NPDES permitted ash ponds. The UWL will

be utilized for the permanent dry disposal of the some of the fly ash and bottom ash currently stored in the ash ponds, as well as future fly ash and bottom ash generated during the remaining life of the Labadie Energy Center.

Ameren Missouri is planning to install air emissions controls on the coal-fired boilers at the Labadie Energy Center in the future consisting of FGD systems to reduce sulfur dioxide emissions. FGD systems will produce byproducts that may require disposal in the UWL. The FGD byproducts are anticipated to consist primarily of silt-sized particles that will, if necessary, be conditioned at the power plant prior to transport to the UWL for disposal.

Projected CCP waste volumes are tabulated in Appendix L. The average 5-year waste generation rate projected for the UWL varies through the first 15 years of life due to the planned start-up of FGD scrubbers. Based on projected CCP generation rates, the estimated life of the UWL is approximately 24 years.

3.6 Solid Waste Excluded

All other solid wastes not specifically listed in Section 3.5 above will be excluded from the UWL. A specific list of waste excluded is provided in Section 4.4 of the operations section of this report. The landfill manager/operator will be trained on how to identify unacceptable wastes so that unacceptable wastes may be rejected or removed if inadvertently delivered to the UWL's active disposal areas. Since the primary acceptable wastes are CCPs from the Labadie Energy Center, the exclusion of unacceptable waste is more easily managed and verified by the landfill manager/operator. The CCPs will be delivered to the UWL by truck and will exclusively come from the Ameren Missouri Labadie Energy Center. The likelihood of unacceptable waste being trucked to the UWL is minimal. However, the UWL equipment operator will visually screen incoming haul trucks preparing to unload at the active working face for unacceptable waste materials in their load.

Trucks hauling unacceptable waste will not be allowed to unload and will be directed to return to the plant to manage the waste in accordance with the plant waste management procedures. Unacceptable wastes inadvertently unloaded at the UWL's active working face will be reloaded into empty trucks and returned to the plant to be managed in the plant waste management system, as appropriate.

3.7 Stormwater Management System

Stormwater management requirements will change throughout the operating life and closure of UWL Phases 1, 2, 3 and 4. Ameren Missouri's objective to contain and reuse as much stormwater falling within the footprint of the UWL as possible is the primary factor in the design of the stormwater controls that will result in 'no discharge' from the UWL. Other factors that add or subtract significant water quantities from the UWL include: infiltration of direct precipitation; evaporation and evapotranspiration; and water re-used on-site for CCP moisture

conditioning and dust control. Excess water will be managed as described in Section 3.1.3. Direct precipitation falling within the disposal area is considered in the stormwater runoff design calculations.

10 CSR 80-11.010(8)(B)1.F.(III) states, in part, "On-site drainage structures and channels shall be designed to collect and control at least the water volume resulting from a twenty-four (24)-hour, twenty-five (25)-year storm." The published rainfall for the 25-year, 24-hour rainfall event is approximately 5.6 inches in a 24 hour period. The drainage structures included in the UWL are designed to meet or exceed this requirement.

3.7.1 Stormwater Runoff Controls

Stormwater in active disposal area will be controlled by a system of perimeter berms, let down channels, side slope bench drainage ways and perimeter ditches, all ultimately conveying runoff to the on-site stormwater holding ponds. Some of the stormwater falling into active disposal areas that infiltrates into the CCPs will ultimately drain to the leachate sumps in the bottom of each cell where it will be removed by pumping to above ground tanks for temporary storage. The number and location of leachate storage tanks will require ongoing evaluation as a part of the UWL operations. The leachate level in the storage tanks will be regularly monitored, and the tanks emptied when required. Leachate removed from the tanks will be utilized as described in Section 3.1.3. Landfill operations will strive to maintain slopes on active landfill areas to minimize ponding.

During the initial, active operation of disposal cells, stormwater runoff may temporarily pond on the CCPs within the UWL. Temporary collection basins will be located within the active disposal cell and temporary pumps used to pump accumulated runoff to the perimeter ditch or directly to adjacent stormwater holding ponds to minimize the amount of stormwater that infiltrates into the waste. After the elevation of in place CCPs exceeds the height of the perimeter ditch, the CCPs will be graded to maintain slopes on active landfill areas to avoid ponding, except in temporary collection basins. Ultimately, the perimeter ditch will convey stormwater from the side slopes, letdown structures, and side slope benches to the on-site stormwater holding ponds. These structures are described below, starting at the top of the UWL.

Small perimeter berms on top of the UWL near the slope break line will be maintained to direct stormwater runoff from the top of the UWL to designated letdown structures located around the UWL top perimeter. The letdown structures will convey the runoff in a controlled manner from the top of the UWL to the perimeter ditch or surrounding ground surface. Letdown structures have been sized to minimize the number of drainage channels that must be constructed and maintained around the perimeter of the UWL.

Side slope benches and letdown structures are designed to carry stormwater from the upper portion of the UWL slopes to the perimeter ditch and ultimately to the surrounding ground surface around the completed UWL.

During operations, the active disposal areas may have both closed areas and active areas. Temporary structures consisting of ditches or berms are used to control flows during the ongoing landfill operations. All stormwater that comes in contact with CCPs in the active areas will be managed within the active disposal area as described above and conveyed to the on-site stormwater holding ponds. Stormwater in the unlined areas of future disposal areas will be separated from leachate and contact stormwater by the interior berms at the interface of the lined and unlined areas. Stormwater from the closed sections of the UWL will be temporarily stored in adjacent ponds. This collected stormwater will be used at the UWL for dust suppression, routed to the on-site stormwater holding ponds for re-use in the UWL, or pumped to the Labadie Energy Center for management. Stormwater managed through the Labadie Energy Center's stormwater management system will comply with current NPDES operating permit requirements. In the NPDES operating permit renewal application dated December 22, 2011, Ameren anticipated excess stormwater flows from the UWL will be routed through the plant's stormwater management system and ultimately discharged through Outfall 002. Prior to beginning construction, Ameren will file appropriate NPDES permit modifications to assure timely receipt of the required authorizations. Copies of all future NPDES permit correspondence related to the UWL will be submitted to the Solid Waste Management Program.

Management of surface water runoff after closure is addressed by dividing the closed UWL into distinct drainage areas to control runoff quantities and velocities from the final UWL surface. Stormwater falling on closed UWL sections will be conveyed to the outside toe of the perimeter berm where it will be discharged. The side slope benches and letdown structures define the individual drainage areas for the final contours of the landfill. These surface water structures are designed to manage flow rates, quantities and velocities resulting from the 25-year, 24-hour rainfall event referenced by the 10 CSR 80-11.010(8)(B)1, or greater. Appendix N, Figure 1 shows the overall stormwater management for the closed landfill and the location of stormwater control structures.

Runoff volumes were calculated using the Rational Method, which is applicable to the small drainage areas involved. Stormwater diversion structures, capacities and velocities were calculated using Manning's Equation for open channel flow. The perimeter ditch used to convey stormwater to the pump stations or stormwater holding ponds is modeled using both Bernoulli's Equation and Manning's Equation.

The side slope benches are designed as 1.5-foot deep, 19.5-foot wide, "V" bottom ditches. These benches are located around the perimeter of the UWL on the finished slope at approximately elevation 520. This elevation was chosen as it is approximately halfway up the side slope of the UWL. The side slope benches will be graded into the exterior surface of the

UWL as it reaches elevation 520 to 525.

The permanent side slope letdowns have been designed as flat-bottom trapezoidal ditches with a bottom width of eight (8) feet. This will allow the drainage structures to be easily cleaned and maintained. The height of the channel side slope may vary depending on the final channel slope and required flow capacity for the individual letdown. The permanent letdowns will be lined with riprap or commercially available erosion mats to dissipate energy and prevent erosion of the final slope and final cover.

The perimeter ditch at the toe of the exterior side slope is designed as a flat bottom trapezoidal ditch with a six (6) foot wide bottom, 3:1 (H:V) side slopes and a maximum depth of five (5) feet below the top of the perimeter berm (see Sheet 19). A brief description of each drainage way, associated design parameters, and calculations are shown in Appendix M.

As the exterior side slopes of the landfill are completed and the side slope benches are constructed, letdown structures will be constructed and maintained. The side slope benches are placed approximately 37 vertical feet up the side slopes, resulting in a maximum 111-foot long slope length for sheet flow. The side slope benches will be constructed approximately midway between the top and bottom of the UWL side slope, resulting in a bench being stepped into the side slope. As noted in Section 3.4, the final grading plan will utilize a maximum slope of 3:1 (H:V). Reducing the drainage slope length by incorporating side slope benches significantly reduces the potential for long term slope erosion. (Reference calculations provided in Appendix M).

The spacing of the letdown structures is designed to minimize the distance that concentrated runoff must travel to a letdown structure and, to the extent practical, equally distribute the amount of stormwater that any single letdown structure will carry. All letdown structures are designed for a 25-year, 24-hour rainfall intensity or greater. Calculations for the design of the letdown structures are found in Appendix N. Sheet 21 contains typical construction details for the side slope benches, letdown channels and perimeter ditches.

Erosion of the final cover, side slope benches, stormwater letdown structures, and perimeter ditches were evaluated using North American Green's Version 4.31 Erosion Control Materials Design software. The software uses the Revised Universal Soil Loss Equation to conservatively evaluate the amount of erosion that will occur on a slope. Variables include the rainfall/runoff factor, erosion potential of soils, slope length and gradient, and vegetation or mechanical protection. The software conservatively evaluates channel erosion using the maximum shear strength method outlined in the Federal Highway Administration's HEC #15 and the United States Agricultural Department's (USDA's) Ag Handbook #667. All drainage structures will be protected from erosion using one of several possible materials: an erosion control mat, limestone riprap, or other manufactured erosion control product. The results of the erosion evaluation are provided in Appendix M. Appendix M also identifies the minimum type of

erosion protection required for each section of the drainage ways.

Stormwater from the side slopes and top of the closed UWL will discharge directly into the perimeter ditch. The total volume of runoff from completed Phases 1 through 4 (approximately 166.5 acres) during the 25-year, 24-hour design storm is estimated to be 31.2 acre-feet. These maximum runoff volumes are supported by calculations found in Appendix N.

3.7.2 Water Quality Permits

The stormwater retention ponds, within the UWL footprint will be permitted by the SWMP. Consequently, construction permits through the Water Protection Program (WPP) are not required. The need for modifications to the existing Labadie Energy Center NPDES permit for management of excess water will be discussed and acted on with the MDNR WPP. This will occur during the solid waste disposal area construction permit application review period. MDNR SWMP will receive a copy of all correspondence relating to an NPDES permit modification.

Land disturbance permits will be obtained from Franklin County and MDNR for construction of each landfill phase. The applications for state and county stormwater permits will be submitted in a timely fashion, under separate submittals from the solid waste permit application with copies of the cover and/or transmittals letters submitted to MDNR SWMP. A separate stormwater permit is not anticipated for precipitation falling outside the perimeter berms once the perimeter berms are constructed and the exterior slopes are stabilized under the land disturbance permit.

3.8 Landfill Liner

The proposed UWL will utilize a bottom composite liner system consisting of two feet of compacted clay soil and a flexible geomembrane liner. The compacted clay will be a minimum of two feet thick with a hydraulic conductivity of 1×10^{-7} cm/sec or less. This hydraulic conductivity significantly exceeds the minimum standard of 1×10^{-5} cm/sec allowed by 10 CSR 80-11.010(10) for a composite liner system. The upper component of the composite liner will be a minimum thirty (30) mil thick geomembrane, unless the geomembrane is high density polyethylene (HDPE). HDPE geomembrane liners will be at least sixty (60) mils thick. The UWL is currently designed with a 60-mil HDPE geomembrane liner. Ameren Missouri retains the option to consider other geomembrane liners during the life of UWL with proper design and regulatory approval. The proposed composite liner design exceeds the current state requirements for UWLs.

3.8.1 Grading Plan

The overall UWL bottom grading plan is shown on Sheet 5. The grading plan shows the top of the constructed landfill bottom liner. The actual subgrade of the disposal area prior to liner

construction will be approximately two (2) feet below the elevations shown. The UWL bottom elevations were determined based on several factors: the site-specific geotechnical information; the seasonal high groundwater elevation; the bottom slope requirements for maintaining less than 12-inches of leachate on the UWL bottom; the ultimate settlement of the natural soils underlying the UWL; and the minimum regulatory bottom grade slopes for a UWL.

The bottom liner grading plan for the UWL is based on perimeter berm interior side slopes of 3:1 (H:V), a minimum bottom slope of 1.0% in the direction of leachate flow (perpendicular to the bottom contours) and a minimum slope of approximately 0.5% along leachate collection pipes, forming a “herringbone” bottom grading plan.

An inflection point approximately 198 feet from the inside toe of the perimeter berm has been designed into the leachate collection pipe slope to accommodate anticipated long-term settlement that will flatten the resulting slope of the pipe. At this inflection point the leachate drainage pipe and trench slope increase to 1.0% to the leachate sump. Over the life of the landfill and during the post closure period, settlement along the leachate collection pipe is estimated to flatten the pipe slope to approximately 0.5%. A detail graphically illustrating the typical settlement cross section along the leachate collection pipe is provided on detail 1/18 (reference Sheet 18). Additional calculations are provided in Appendix Y that supports the use of this design for the leachate collection pipe trench.

Due to the construction of interior berms in the UWL, each disposal area’s leachate collection drainage pattern is independent, draining to more than one perimeter, interior leachate collection sump. In Phase 1, the leachate collection system drains to two (2) leachate collection sumps along the southwest perimeter berm. In Phase 2, the leachate collection system drains to three (3) leachate collection sumps along the north perimeter berm. In Phase 3, the leachate collection system drains to six (6) leachate collection sumps located on the northeast perimeter berm. In Phase 4, the leachate collection system drains to four (4) perimeter leachate collection sumps on the west perimeter berm. All leachate collection sumps are located at the inside toe of exterior berms and include a side slope riser for access to the leachate sump.

3.8.2 Materials and Construction

The proposed composite liner will consist of a two-foot thick compacted clay soil liner, immediately overlain by a 60-mil HDPE smooth or double-textured liner. Alternative geomembrane liner materials may be considered during the operation of UWL depending on costs and future developments in industry standards. The soils beneath the UWL footprint are a mixture of clays, silts, and sands. The sands and silty sands grade from fine to coarse with depth.

Laboratory tests on the landfill foundation soils indicate that differential settlement and subsidence of the insitu unconsolidated soils will not impact the structural integrity of the liner or leachate collection drainage systems in the UWL (reference Appendix J). Design calculations

for landfill slope stability and settlement, as well as characterization of in-situ materials, are included in the geotechnical report in Appendix J. The settlement evaluation of unconsolidated soils under the final UWL (100 feet +/- of CCPs) indicated a generally uniform settlement of up to 26 inches under the full depth of waste with lesser settlement near the outside slopes. Due to this anticipated differential settlement, the leachate collect pipe grades were steepened near the outside perimeter of the UWL to maintain positive gravity drainage to the sumps.

3.8.2.1 Soil Component

Exploratory drilling and testing during the DSI determined an insufficient quantity of soil materials exist within the proposed UWL 166.5-acre waste footprint and adjacent 813-acre UWL permit boundary to construct and operate the proposed landfill (refer to Appendix K).

Appendix J provides a summary of the soil classification and laboratory test results for the samples collected during the DSI field investigation. The laboratory testing demonstrates that insufficient quantities of suitable soils within the proposed UWL site are available to construct a soil liner with a permeability less than 1×10^{-7} cm/sec.

The clay soils planned for construction of the bottom clay liner will come from off-site. Reitz & Jens completed a geotechnical investigation at the proposed off-site borrow area at the Ameren Missouri Callaway Energy Center property in Callaway County. Twelve (12) borings were drilled at the site and soil samples collected for geotechnical testing. The results of this investigation determined that the off-site borrow area at the Callaway Energy Center Site had at least 2.6 million CY of available clay liner quality soil. The amount of soil required for the UWL bottom composite clay liner and clay cap on the side slopes will be approximately 639,000 CY.

Liner quality clay will be brought to the UWL site, segregated and stockpiled in advance of construction of the liner. The stockpile will be tested for homogeneity and compaction criteria will be developed to determine the range of dry unit weights and moisture contents that will achieve the required maximum permeability of 1×10^{-7} cm/sec, and the other minimum engineering properties that were assumed in design. The bottom soil liner will be placed in thin lifts (six (6) to eight (8) inch layers), compacted with a pads foot roller, or equivalent compactor, and density/moisture quality control testing performed on each layer. Compaction will be performed in accordance with the criteria developed for the stockpiled liner material. Additional lifts will be constructed after quality control testing has been conducted, verifying the proper construction of the previous lift, until the minimum compacted clay liner thickness has been obtained. After verification of proper construction of a lift, the surface will be lightly scarified, as needed to assure cohesion between the two lifts and minimize horizontal permeability in the soil portion of the composite liner. Minimum soil liner placement and testing criteria are provided in the Construction Quality Assurance Plan (CQA) in Appendix P.

Prior to the start of the UWL construction, areas beneath the UWL footprint will be stripped of the existing 'top soil' and the perimeter flood protection berm will be constructed. A qualified

soils technician under the supervision of a geotechnical engineer will observe and evaluate all earthwork and grading conducted as part of this site development work. The soils will be sorted by suitability for use as intermediate cover, final cover, final vegetative layer, clay liner soils and/or general soil fill and stockpiled on-site within the UWL permit boundary.

The stockpile of off-site clay for liner construction will be sampled, tested and used to construct a test pad to determine proper placement criteria to achieve the required permeability standard for the clay liner component of the composite liner system design. Prior to the start of the installation of the clay liner component of the composite liner system, a clay liner test pad will be constructed to establish specific placement procedures, specifications, and quality control and assurance testing. The verification testing will demonstrate the clay liner will meet or exceed the permeability standard of 1×10^{-7} cm/sec. The same construction procedures and clay liner selection, placement, compaction and construction quality assurance testing and verification as used on the test pad will be followed for all UWL Phases.

3.8.2.2 Geomembrane Component

A 60-mil HDPE geomembrane liner will be used for the top layer of the composite landfill liner. Both smooth and double-sided, textured HDPE geomembrane liner will be used in accordance with the design. The liner material will be placed immediately on top of the two foot compacted clay soil liner. The textured geomembrane will be utilized in the construction on the interior 3:1 (H:V) side slopes of the perimeter berm and will transition to the flat bottom liner areas as needed. Stability calculations for the textured geomembrane on side slopes are found in Appendices J and Y. All geomembrane liner materials will be anchored at the top of the slope in accordance with the manufacturer's recommendations and the anchor trench details shown on Sheets 16 and 17.

Minimum liner manufacturing quality assurance (MQA) and construction quality assurance (CQA) are provided in the CQA Plan (Appendix P). Actual liner materials and construction will be bid to meet specifications developed during the construction design for all Phases, or the equivalent, to allow for competitive bidding and changing technological issues.

3.9 Leachate Management System

All phases of the UWL are designed for disposal of utility waste CCPs. In the disposal process, leachate (e.g., water that has infiltrated into the CCPs) will be collected by the leachate collection system constructed immediately on top of the composite liner within each disposal cell. A blanket leachate collection system will cover the bottom and side slopes of each disposal cell. The leachate collection system for each bottom drainage area will be installed over the composite liner system and will drain to a leachate collection sump. Each disposal cell will utilize multiple leachate collection sumps. Each leachate collection sump will be equipped with a submersible pump with access to the sump via a minimum 18-inch diameter side slope riser pipe. The submersible pump will have automatic controls to remove leachate at preset

water levels to maintain the leachate level at less than 12-inches at any point on the bottom of the UWL.

3.9.1 Leachate Generation Rate

The HELP model has been used to estimate the quantities of leachate generation under two (2) operating and one (1) closed condition. The results of the HELP model are presented in Appendix O. Table O-1 in Appendix O provides a summary of the HELP model results, including the Peak Daily Leachate Volume and the Average Annual Leachate Volume. The data in this table was used to predict leachate generation rates for pumping, transport and storage. Ameren's active 'dry cell' CCP landfills in Illinois consistently generate significantly less leachate from the leachate sumps compared to the volumes predicted by the HELP model. Therefore, the leachate quantities predicted by the HELP model are considered to represent conservatively high, or 'worst case' scenarios.

3.9.1.1 Pre-Closure Generation Rate

The first operating condition modeled is during initial operations when CCPs have been placed over the entire liner and leachate collection system in an approximate 7-foot lift. The second operating condition modeled is when CCPs have been placed to the approximate height of the perimeter berm (average depth of 20 feet). The peak daily quantity of leachate flow estimated by the HELP model for the landfill operations in the first constructed portion, Phase 1, ranged from 812 to 2,571 cubic feet/day (4.2 to 13.4 gpm). The peak daily quantity of leachate accumulating in Phase 1 will be split between the two sumps, which are approximately equal in the size of their drainage area. This results in estimated peak daily flows per sump ranging from 406 to 1,285 cubic feet/day (2.1 to 6.7 gpm). The drainage areas per sump in the other three Phases are all smaller than for Phase 1, and as a result the estimated peak daily flow per sump is less than for Phase 1.

3.9.1.2 Post-Closure Generation Rate

The post-closure generation rate assumes that the landfill is properly closed; limiting precipitation to direct rainfall and minimizing infiltration into the landfill through the final cover system. Separate cases were modeled for two closed conditions: the flatter top slope with a geomembrane/clay composite cap; and the steeper side slopes with a clay-only cap. For final closed condition with final cap installed, the HELP model results of the two closed condition cases were combined to determine the post-closure peak daily quantity of leachate flow of approximately 557 cubic feet/day (2.9 gpm) for Phase 1.

3.9.2 Water Storage and Disposal

The UWL is designed as a no-discharge facility for rainfall events up to and including the 25-year, 24-hour design storm. Any leachate that is generated within the in place CCPs during

operation will be collected in the leachate collection sumps and transferred to on-site storage tanks. The temporary storage tanks will be strategically located within the lined, permitted UWL protected from 100-year flood events. Plan sheets 6, 7, 8 and 9 show the general location of a single leachate storage tank for each cell, although there is sufficient room for several tanks at each location. If necessary, additional area for setting temporary leachate tanks can be developed within the active disposal cell on top of the CCPs, which are routinely used beneficially as a construction fill material.

The number and location of tanks will require ongoing evaluation as a part of the UWL operations. Leachate and stormwater management options include: use to moisture condition CCPs prior to disposal in the UWL; use on haul roads or active CCP disposal areas within the permitted disposal boundary for dust control; or use as makeup water for future scrubber systems. The water management calculations found in Appendix Y(c) conservatively estimate that reusing the on-site stormwater and leachate for moisture conditioning and dust control on interior haul roads can annually consume approximately 1.5 times the quantity of stormwater and leachate that is predicted to be generated by the UWL under the worst case scenarios modeled in Appendix O. Excess leachate will be managed through the Labadie Energy Center NPDES permit, or transported off-site for disposal.

Appendix Y(c) also assumes that prefabricated 10,000 gallon storage tanks, which are readily available in the market place, will be used to temporarily store the leachate on-site until it can be beneficially reused within the UWL, or transported to an off-site location for disposal. Preliminary analysis using the average annual leachate generation rates indicate that 5 to 7 10,000-gallon tanks (a total of 50,000 to 70,000 gallons of temporary storage capacity) will provide a minimum of 1 week storage during the initial operations of Cell 1. These tanks will be interconnected and located in a "tank farm" at the approximate location shown on Plan Sheet 6. The two leachate pumps required for Cell 1 will connect to a force main that conveys the leachate to this tank farm. Using the leachate generation history from the operation of Cell 1, the number of tanks required to manage leachate generated from Cells 2, 3 and 4 can be more accurately predicted using actual peak and annual data. However, the long-term leachate storage requirements will depend on the actual amount of leachate generated and amount reused within the UWL, which will require ongoing adaptive management based on historical data during the UWL operation.

Additional temporary leachate storage capacity is available in Pond 1 for Phase 1 during start-up operations, and subsequently, Pond 2 during the start-up operations of Phase 3. The ultimate purpose of these ponds is to manage stormwater runoff from the active disposal cell; however during initial cell disposal operations, stormwater runoff will be contained within the cell until the cell has been sufficiently filled with CCPs to allow gravity flow of excess stormwater into Pond 1. Until that time, the entire capacity of Pond 1 (and subsequently, Pond 2) is available for temporary leachate storage. One worst case scenario that does not require the HELP model to evaluate involves a large (e.g., 25-year, 24-hour) rainfall event that occurs

during the initial filling of a new disposal cell before the leachate collection system is covered with a lift of CCPs. As a practical matter, this water is characteristically 'contact storm water' and not 'leachate', although the regulatory definition of 'leachate' includes water that has come in contact with solid waste. Such an event, if it occurs, will generate a large quantity of water that must be removed from the disposal cell and stored in the stormwater ponds until it can be reused or disposed off-site. The design capacity of the stormwater ponds are adequate to store and manage this water until it can be reused or disposed off-site.

After closure of the UWL, leachate collected in the UWL will be managed through the Labadie Energy Center's NPDES discharge permit, or transported off-site for disposal. Following closure, stormwater that has not come in contact with CCPs will be discharged outside of the perimeter berm as uncontaminated stormwater. This future activity may require that a separate NPDES permit be obtained for the UWL after the proper closure of the facility. The need for a separate permit and the need for continued use of the constructed stormwater ponds will be determined based upon current federal, state and county regulations at the time of UWL closure.

3.10 Groundwater Monitoring

The proposed UWL is designed to protect the quality of local and regional surface water and groundwater. This is accomplished with the composite bottom liner system, stormwater management system, leachate management system, and the final cover system. Groundwater quality will be routinely monitored and the data evaluated to track the ongoing performance of the landfill design and operation with regard to groundwater protection.

3.10.1 Groundwater Quality

Groundwater in the alluvial aquifer at the UWL site has not been sampled for background chemical constituents. Groundwater quality is presumed to be consistent with local alluvial groundwater quality in the area. Groundwater quality will be determined after the installation of a groundwater monitoring network and the collection and analytical testing of the minimum number of representative samples from the monitoring network required for statistical analysis prior to the start of the UWL operation.

Water samples will be collected in accordance with the site sampling and analysis plan (SAP) included as Appendix Q and then laboratory tested for chloride, fluoride, sulfate, chemical oxygen demand, total dissolved solids, total organic carbon, total organic halides, iron, and metals. Field tests of the samples will include pH and conductivity. The test results, along with chain of custody records, will be compiled in a Groundwater Monitoring Report and will become part of the UWL facility operating record to be used to establish background groundwater quality.

3.10.2 Groundwater Monitoring System

A permanent groundwater monitoring system has been developed based on the results of the DSI. The groundwater monitoring system will monitor the uppermost continuous aquifer beneath the proposed UWL site, which consists of alluvial sand deposits. This hydrologic unit is generally described as representing channel, channel margin, crevasse splay, and natural levee deposits in Section 5.1 of the DSI Report.

The UWL site is located in the floodplain of the Missouri River. The uppermost aquifer is an unconfined aquifer system within the alluvium that is recharged by, and influenced by, the water flowing within the river. Groundwater elevations beneath the site fluctuate with, and are influenced by, the respective Missouri River stages. During and subsequent to the DSI, multiple rounds of groundwater level measurements were observed, recorded and evaluated in relation to river stage levels to determine the influence of the Missouri River on groundwater elevations, gradient and direction of flow. Summary results of the hydrogeologic information are provided in Appendix W(a).

This analysis concluded that the Missouri River stage directly impacts the groundwater gradient and flow direction of the uppermost aquifer. Since the Missouri River stage fluctuates seasonally, the uppermost aquifer has a variable direction of flow. Overall, when river elevations are relatively high, groundwater movement is generally toward the east and southeast. Conversely, when river elevations are relatively low, groundwater movement is generally to the north and northwest. The analysis also determined that temporary, seasonal fluctuations of the Missouri River stage are too brief to significantly interfere with the proposed groundwater monitoring program relative to upgradient and downgradient trends.

During periods of high river level, groundwater flow generally is to the east-southeast, with the result that groundwater monitoring wells in the northwestern part of the site are generally hydraulically upgradient and groundwater monitoring wells in the southeastern part of the site are generally hydraulically downgradient. During periods of low river level, groundwater generally flows to the north-northwest, with the result that groundwater monitoring wells in the northwestern part of the site are generally hydraulically downgradient and groundwater monitoring wells in the southeastern part of the site are generally hydraulically upgradient. Groundwater monitoring wells along the western and southern boundaries of the UWL generally remain upgradient regardless of river stage and groundwater monitoring wells along the eastern boundary generally remain downgradient regardless of river stage.

An existing agricultural irrigation well northeast of Cell 3 will remain operational during operation of the UWL, and when used, will operate at a reported estimated maximum rate of 1,200 gpm. This well will only operate periodically during periods of dry weather, typically for durations of up to four days. The periodic operation of this well will have unmeasurable impacts on the groundwater levels in the adjacent groundwater monitoring wells. Refer to Appendix W(b) for

the detailed analysis of the agricultural well impact.

Appendix X(a) and X(b) provides a summary of the methodology and rationale used to establish the proposed groundwater detection monitoring system. The proposed detection monitoring system consists of thirty-two (32) permanent shallow groundwater monitoring wells and one temporary well to be installed after approval of the proposed groundwater monitoring system design. In addition, the proposed detection monitoring system will include three (3) deep groundwater monitoring wells to develop water quality data for the lower portion of the unconfined aquifer. The minimum number of representative samples from the monitoring network required for statistical analysis will be collected and analyzed prior to the start of CCP disposal.

Each of the thirty-two (32) shallow detection monitoring wells is designed to monitor groundwater within the uppermost alluvial sand deposits underlying the UWL to an approximate depth of up to 25 feet. The permanent shallow detection monitoring system includes seven (7) wells that are generally hydraulically upgradient and twenty-five (25) wells that are generally hydraulically downgradient. The permanent shallow detection wells are designated MW-1 through MW-32 with the proposed well locations shown on Sheets 3, 5 and 10. MW-1 through MW-21 and MW-29 through MW-32 are generally downgradient well locations, while MW-22 through MW-28 are generally upgradient well locations. Temporary well TMW-1 is generally downgradient of Cell 1. TMW-1 will be abandoned during the construction of Cell 3.

The three (3) deep detection monitoring wells are designed to monitor groundwater within the lower alluvial deposits underlying the UWL at an estimated depth of 85 feet or less. The deep detection monitoring system includes one (1) well that is hydraulically upgradient and two (2) wells that are hydraulically downgradient. The deep wells are designated MW-33(D), MW-34(D), and MW-35(D) with the proposed well locations shown on Sheets 3, 5 and 10.

The proposed design for each well is described in Appendix Q. A typical groundwater monitoring well detail is shown on Sheet 18. The proposed design for each well includes: northing and easting coordinates; total depth of well; the length of the well screen; approximate elevation range for monitored interval (bottom of drill hole to top of primary filter pack); top of primary filter pack; well slot size; filter pack gradation; surface seal; and surface completion. The "monitored interval" will include the length of the primary filter pack, and not simply the length of the well screen. In addition, the backfill from the top of the filter pack to the ground surface will be a bentonite grout.

During installation, all monitoring wells will be located in the field such that reasonable access can be gained for the purpose of monitoring, maintenance, and repair. Each well will be installed to facilitate surface drainage in the vicinity of the well to the extent practical. Wells will not be placed in areas where standing water accumulates during significant precipitation events. Wells will also be placed a safe distance away from overhead utilities or known

underground utilities or hydraulic conduits.

3.10.3 Corrective Action

As per 10 CSR 80-11.010(11)(C)6, an assessment of corrective measures will be initiated within ninety (90) days of a reported Statistically Significant Increase (SSI) that exceeds the applicable groundwater protection standards. In response to a statistical analysis which results in an SSI, Ameren Missouri will submit the required information to MDNR. If the SSI is determined to have resulted from the landfill, Ameren Missouri will, within ninety (90) days of the last sampling event, obtain additional groundwater samples from the wells that exhibited SSI(s), split the samples in two (2) equal aliquots and separately obtain analyses of both aliquots at independent laboratories to determine whether the SSI(s) was the result of laboratory error.

After obtaining the results from initial or subsequent sampling events that detect SSI(s), Ameren Missouri will notify MDNR within fourteen (14) days and place a notice in the operating record of the detection. Ameren Missouri will, within ninety (90) days and on a quarterly basis after that, resample all wells, analyze the samples for all Appendix 1 parameters and notify MDNR of the constituent concentrations. Based on the results of the continued sampling, Ameren Missouri may be required to conduct an assessment of corrective measures and propose a remedy to the department. Based on the results of the corrective measures assessment, a report describing the proposed remedy will be submitted to MDNR.

The report will be placed in the operating record and will include a schedule for implementing the corrective action remedy. Ameren Missouri will implement the corrective action remedy measures according to the schedule to be protective of human health and the environment around the facility.

3.11 Cover Material

Due to the nature of the CCPs, intermediate cover (i.e., one (1') foot of compacted soil cover applied to any areas idle for more than 60 days) on inactive areas is generally not necessary to prevent wind or water erosion of the deposited CCP. However, intermediate cover will be provided as per the regulatory requirements of 10 CSR 80-11.010(14)(C)1.

The majority of inactive acreage in the UWL will be on the side slopes of the UWL. These areas will be undisturbed, dried solids that are not susceptible to wind or water erosion. In addition, the UWL has been designed and will be operated as a no-discharge facility for all stormwater. Stormwater discharges from these areas will be limited to controlled discharges from the top of the UWL into the perimeter ditch and subsequently to the on-site stormwater ponds. Accumulated stormwater will be reused within the disposal area or pumped back to the Labadie Energy Center to maintain no discharge at the UWL.

CCPs are relatively inert, relatively impermeable and will be moisture conditioned when placed to promote compaction and minimize dust. Per 10 CSR 80-11.010(14)(C)1, intermediate cover will be applied to a total thickness of at least one foot (1') of compacted soil on areas of the UWL in which waste has been placed and which are idle for more than sixty (60) days, as well as on final side slopes at the end of each fill sequence. Intermediate cover will be reused to the extent practical. As idle areas become operational again and final side slopes receive final cover, the intermediate cover will be removed and stockpiled for re-use. For purposes of estimating the volume of intermediate cover required, no more than 57 acres of fill area on final side slopes and idle areas will be open for more than 60 days at one time.

To improve aesthetics and minimize the potential for erosion, the intermediate cover on the exterior side slopes above the perimeter flood protection berm of the UWL will be vegetated at least once for every ten (10) vertical feet of elevation as final cover subgrade is reached. The intermediate cover on the final side slopes will be applied to a total thickness of at least one foot (1') of compacted soil and vegetated with a mixture of rapidly germinating grass species. The filling sequence of each active waste disposal phase will be continuous up to the approximate interim elevation of 520 feet.

3.11.1 Soil Cover Sources

Vegetative soil cover material will be obtained from the on-site stockpile created when the UWL footprint is cleared and grubbed, or off-site borrow areas, as necessary during the life of the UWL. In general, the quantity of materials excavated during clearing and grubbing of the UWL site are suitable and sufficient for use as landfill final vegetative cover. During excavation of soils on the UWL site, and when off site soil borrow materials are brought to the UWL site to be stockpiled for future construction, Ameren Missouri will have a qualified soil technician available to evaluate and sample the soil materials, as necessary. Testing will be conducted, as necessary, to classify the soils and determine their suitability for various required uses, whether they are used immediately or stockpiled. The volume of soil required to cover the exterior side slopes of the UWL has been accounted for in the volume of soil needed for final cover (Appendix K).

3.12 Landfill Final Cover

The proposed final cover design will utilize a composite final cover system on the top and side slopes as shown on Sheet 15. The final cover on the uppermost "flat" area (approximately 2% slope, but a minimum 1% slope) will consist of a single-sided textured 40-mil HDPE geomembrane liner placed directly on the CCPs, overlain by a 16 oz/yd² non-woven, needle-punched geotextile, and covered with two (2) feet of nominally compacted vegetative soil. The upper layer of the soil will be capable of supporting the final vegetative cover.

The final cover on the landfill's exterior side slopes (33% slope) will consist of a textured 40-mil HDPE geomembrane liner placed directly on the CCPs, overlain by a 16 oz/yd² non-woven,

needle-punched geotextile, and covered with two (2) feet of nominally compacted vegetative soil capable of supporting the final vegetative cover. The final cover designs meet or exceed the current state solid waste rules, as described in 10 CSR 80-11.010(14).

The final cover systems will minimize infiltration of rainfall into the landfill during the post-closure period and improve aesthetics. The two (2) foot of vegetative soil (e.g., the vegetative soil portion of composite final cover system on top of the UWL) will provide a sub-base and root zone for the permanent vegetation on the landfill final cover. The side slope final cover will be vegetated with a process similar to the “vegetation layer” on top of the UWL to provide long-term protection of the soil layer. The organic components of the surface floodplain soils found at the site make these soils suitable for vegetative growth. The final vegetation will provide soil stability and erosion control to the final cover, as well as consume the majority of the rainfall that infiltrates the soil through evapotranspiration.

3.12.1 Materials and Construction

Final cover construction will be completed in increments of approximately forty (40) acres and will be scheduled to take advantage of anticipated earthmoving and vegetation growing seasons. Final cover will include a single-sided textured 40-mil geomembrane liner, overlain by a 16 oz/yd² non-woven, needle-punched geotextile, covered with two (2) feet of nominally compacted vegetative soil available from initial soil stripping (1.75') within the UWL footprint.

3.12.1.1 Soil Component

The approximate top 1.75 feet of soil will be excavated and stockpiled during initial disposal cell construction prior to placement of fill materials or clay liner. These soils will provide the two-foot vegetative layer soils for the final cover.

The first twelve (12) inches of the vegetative layer will be constructed by spreading sixteen (16) inches of soil over the non-woven geotextile cushion and the HDPE geomembrane liner in a single pass with a Caterpillar D-7 bulldozer, or equivalent. The final twelve (12) inches of soil will be constructed by placing the soil material in loose lifts prior to spreading and compacting. Compaction will be provided by the traffic of pan scrapers used to haul the soil to the active work area. The lifts will be smoothed and compacted prior to seed installation.

3.12.2 Vegetation

Following construction of the final cover system, the surface will be graded and prepared for seeding. Seeding will be completed in a timeframe that will take advantage of the fall or spring growing seasons, which is mid February to mid May and late August to late October. Fertilizer, lime and seeding rates may be determined through soil plant nutrient testing. A seed mixture compliant with the MDNR “Landfill Closure Guidance” Technical Bulletin, dated June 2006, will be used for vegetation on the final cover system. As indicated in the closure plan, this seed mix

will consist of a hardy grass or legume mixture, such as fescue (75 lb/acre) and clover (Appendix R). Alternatively, Ameren Missouri retains the option to consider native seed mixes during the closure of UWL, following proper design and regulatory approval.

3.13 Air Quality

The landfill is located in the northeastern portion of Franklin County near the towns of Labadie and St. Albans. The regulatory agency for air quality at the site is MDNR's Air Pollution Control Program. The landfill will comply with any future air quality standards for UWLs. No Air Pollution Control Program operating or construction permits are anticipated for the proposed landfill operations. The landfill will comply with the fugitive dust limitation required by the Labadie Energy Center's existing air operating permit for the facility. The surface of the primary truck haul route from the plant to the UWL and interior UWL haul routes will be stabilized and maintained to minimize fugitive dust from UWL operations.

3.14 General Maintenance of Landfill Systems

In addition to routine daily landfill operations, landfill equipment maintenance, and periodic containment systems construction, the landfill operator will monitor and maintain the following landfill systems and associated equipment:

- Stormwater pumps, drainage channels, ponds, sumps, outfalls and inlets.
- Leachate sumps, pumps, tanks and appurtenances in the CCP disposal phases constructed.

Ameren Missouri will continue the general maintenance and operations of these systems and the associated equipment during the life of the landfill and the post-closure period.

3.15 Closure and Post-Closure

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

The state regulations were used for the development of the Closure Plan, and Post-Closure Plan and associated closure and post-closure cost estimates. The current state guidance document for the development of Closure and Post-Closure Plans for UWLs requests that the plan be developed as a separate document, but reference the appropriate design and construction documents, as necessary. The required Closure and Post-Closure Plan is included in Appendix R.

The Closure and Post-Closure Plan addresses the requirement for Ameren Missouri to grant access to the Missouri Department of Natural Resources, its agents, or its contractors by

executing an easement to the site, on-site soil stockpiles and off-site soil borrow area after issuance of the Construction Permit, at the time of application for an Operating Permit. The most current MDNR easement forms will be used to execute the easements and access agreements to the proposed UWL, on-site soil stockpiles and soil borrow areas.

4.0 LANDFILL OPERATION

The operational standards of the State (MDNR) and Franklin County, where applicable, are incorporated into an operating manual described in this section. In addition, other routine operational procedures will be developed and implemented by Ameren Missouri to provide for operations that protect the public health and the environment.

This section, Landfill Operation, can be removed and used as a separate document from the remainder of the report, providing an independent operational manual for use by the UWL operator/manager.

4.1 Construction and Development

The long-term environmental integrity of the landfill is a direct result of the quality of construction and operations. Landfill excavation, grading, composite liner installation, leachate collection system installation, filling operations, compaction, grading, and construction of stormwater diversion and control structures are among the construction and operation activities that must be properly completed prior to closure. Constructing the landfill to the approved final grade, construction of the final cover systems, and construction of the final stormwater control structures are among the construction activities to be completed during ongoing operations, as the landfill progresses from the bottom to final grades, and during closure activities. Maintenance of these features during the post-closure care period will also require construction activities.

4.1.1 Phased Development

The proposed footprint for disposal of utility waste covers approximately 166.5 acres. The proposed landfill design provides an estimated disposal capacity of 15.5 million CY of total air space. Based on the assumptions and calculations provided in Appendix L, the proposed UWL has an estimated operating life of approximately 24 years.

All large construction projects completed over a lengthy time period are broken down into phases to divide the project into economical and manageable portions. Ameren Missouri's Labadie Energy Center UWL is divided into four (4) distinct phases for the development, construction and operation; Phase 1 (31.4 acres with a 5.7 acre stormwater pond); Phase 2 (35.2 acres, using the 5.7 acre stormwater pond constructed during Phase 1); Phase 3 (57.1 acres, plus a 4.4 acre stormwater pond); and Phase 4 (42.8 acres, plus a 3.4 acre stormwater pond). These phases encompass the overall UWL waste disposal footprint. The four (4) phases allow intermediate stages of completion and evaluation and incorporation of economic or operational changes that can affect the remaining life of the landfill. Each of the phases requires the completion of multiple sump drainage areas. Sheet 5 identifies and describes the boundaries and sequence of completion for the landfill phases that make up the four (4)

operational phases, plus the three (3) stormwater ponds.

A new site access road will be constructed from the Labadie Energy Center to the northwest corner of Phase 1, with an overpass for the existing Labadie Bottom Road. Phase 1 filling will generally progress in a west-to-east and north-to-south pattern, beginning at the western boundary of Phase 1. Phases 2, 3 and 4 will be constructed in sequence after Phase 1. Disposal of CCPs in Phase 2 will generally progress from west to east and south to north. Disposal of CCPs in Phase 3 will generally progress from northwest to southeast and north to south. Disposal of CCPs in Phase 4 will generally progress from north to south.

4.1.2 Sequence of Phase Construction

As described above, the landfill operations are divided into four (4) phases of development (Phases 1 through Phase 4). The following discussion generally describes the sequencing of construction and operation of Phase 1, Phase 2, Phase 3 and Phase 4 with respect to the key elements that provide the primary environmental protection of the proposed UWL.

The transition of the composite liner system between phases and disposal cell areas is shown in typical details in the accompanying plans. The interior berms between Phases 1 and 2 and Phases 3 and 4 will remain in place. During construction of an adjacent disposal cell, the composite liner system components will be exposed at critical tie in locations to allow the compacted clay liner and the geomembrane components to be properly tied and integrated into the existing composite liner to create a continuous liner system that will allow for a continuous leachate collection and removal from the UWL. CQA verification testing and documentation will be the same as the other portions of the composite liner and leachate collection and removal systems. This method will be used to join the composite liner between Phases 1 and 2, and 3 and 4 to create a continuous liner system and leachate collection and removal system under the entire UWL.

The transition details of the leachate collection system between disposal cells and phases are shown in typical details on the plans. The toe of the interior berm that seals the liner and leachate collection system from stormwater in the adjacent, undeveloped disposal area will be removed to provide a continuous liner surface and leachate collection drainage layer as an additional UWL disposal cell is added. CQA verification testing and documentation will be completed along the composite liner and leachate collection system tie in using the same procedures completed on the composite liner components and leachate collection system components for each disposal cell.

Phase 1 Construction Sequence

Phase 1 includes the construction and operation of a disposal area totaling approximately 31.4 acres having two (2) distinct bottom drainage areas and two leachate removal side slope riser sumps. Phase 1 is planned as a single sequence of construction and operation. The following

sequence of activities generally describes the construction and operation of Phase 1:

- Base construction (includes perimeter berms, composite liner, leachate collection and removal system and a 12-inch thick protective layer)
- Construct a 5.7-acre stormwater pond located at the southern boundary of Phase 1.
- To mitigate potential uplift concerns for 100-year flood event, fill disposal area with CCPs to elevation 478.5 as soon as possible after receiving authorization to operate.
- Establish perimeter ditch at elevation 483 with discharge to the 5.7-acre stormwater pond in the southern boundary of Phase 1.
- Reference Phase 1 Pre-closure and Closure for final stages of Phase 1 operations. Install permanent letdowns where indicated on plans and temporary letdowns were needed to manage stormwater and side slope erosion.

Phase 2 Construction Sequence

Phase 2 includes the construction and operation of a disposal area totaling approximately 35.2 acres having three (3) distinct bottom drainage areas and three leachate removal side slope riser sumps. Phase 2 is planned as a single sequence of construction and operation. The following sequence of activities generally describes the construction and operation of Phase 2:

- Reroute the existing Labadie Bottom Road between Phases 1 and 2.
- Base construction (includes perimeter berms, composite liner, leachate collection and removal system and 12-inch thick protective layer)
- Reconfigure the perimeter ditch between Phase 1 and 2 to allow stormwater to flow by gravity from Phase 2 to the 5.7-acre stormwater pond constructed in Phase 1.
- To mitigate potential uplift concerns for 100-year flood event, fill disposal area with CCPs to elevation 478.5 as soon as possible after receiving authorization to operate.
- Establish perimeter ditch at elevation 483 with pumped discharge of stormwater to the 5.7-acre stormwater pond at the southern boundary of Phase 1.
- Set up permanent and temporary letdowns around the perimeter slope as Phase 2 rises to elevation 520 and beyond.
- Reference Phase 2 Pre-closure and Closure for final stages of operations. Install Phase 2 final cover system or intermediate cover as appropriate on respective Phase 2 slopes.

Phase 3 Construction Sequence

Phase 3 includes the construction and operation of a disposal area totaling approximately 57.1 acres and having six (6) distinct bottom drainage areas and six leachate removal side slope riser sumps. Dependent on future CCP generation rates, Phase 3 may be built as two distinct sequences of construction and operation. The following sequence of activities generally describes the construction and operation of Phase 3, assuming that it is built in two construction sequences:

- Base construction of the northwestern portion of the 57.1-acre Phase 3 area (includes perimeter berms, composite liner, leachate collection and removal system and 12-inch thick protective layer)
- Construct a 4.4-acre stormwater pond located at the northern boundary of Cell 3.
- To mitigate potential uplift concerns for 100-year flood event, fill disposal area with CCPs to elevation 478.5 as soon as possible after receiving authorization to operate.
- Establish perimeter ditch at elevation 483 with pumped discharge of stormwater to the adjacent 4.4-acre stormwater pond.
- Set up permanent and temporary letdowns around the perimeter slope as Phase 3 rises to elevation 520 and beyond.
- Reference Phase 3 Pre-closure and Closure for final stages of operations. Install Phase 3 final cover system or intermediate cover as appropriate on respective Phase 3 slopes.
- Repeat above sequence of activities for the remaining southeastern portion of the 57.1-acre Phase 3 area.

Phase 4 Construction Sequence

Phase 4 includes the construction and operation of an area totaling approximately 42.8 acres having four (4) distinct bottom drainage areas and four leachate removal side slope riser sumps. Phase 4 is currently planned as a single sequence of construction and operation; however, this will be re-evaluated later in the operating life of the UWL. The following sequence of activities generally describes the construction and operation of Phase 4:

- Base construction of the 42.8-acre Phase 4 area (includes perimeter berms, composite liner, leachate collection and removal system and 12-inch thick protective layer)
- Construct the 3.4-acre stormwater pond located at the southwest corner of Phase 4.
- To mitigate potential uplift concerns for 100-year flood event, fill disposal area with CCPs to elevation 478.5 as soon as possible after receiving authorization to operate.
- Establish perimeter ditch at elevation 483 with pumped discharge of stormwater to the stormwater pond at the southwest corner of Phase 4.
- Set up permanent and temporary let downs around the perimeter slope as Phase 4 rises to elevation 520 and beyond.
- Reference Phase 4 Pre-closure and Closure for final stages of operations. Install Phase 4 final cover system on respective Phase 4 final slopes.

Phases 1, 2, 3 and 4 Aesthetic Cover

Aesthetic soil cover on inactive side slopes may include:

- Grading CCP surface to two (2) feet below approved final grade.
- Establishing a temporary one-foot thick nominally compacted soil directly on the graded surface of the CCPs. The temporary cover will be placed at least once per

every ten (10) vertical feet of height completed in the active disposal areas in each Phase.

- Seed to establish vegetation on the intermediate side slope cover annually.
- Periodically review and maintain vegetation to provide adequate erosion protection in accordance with Section 3.11.

Phase 1, 2, 3 and 4 Pre-Closure and Closure

The following sequence of activities generally describes the final stages of operation and construction of each Phase:

- Each Phase area will be operated until the elevation of CCPs at the top of the 3:1 side slope boundary is at maximum elevation of approximately 552 (Phases 1 and 2) or 554 (Phases 3 and 4), which is approximately 2-feet below the proposed final grade.
- Final closure includes placing the geomembrane and soil final cover on the UWL top and side slopes.
- Stormwater drains and permanent let downs shall be installed on the top perimeter, side slopes, and across the perimeter ditch at the base of the 3:1 side slopes per the drawings to manage stormwater during the post closure period.
- Side slope benches and let downs will be graded and constructed, as necessary.
- Final cover will be constructed on the all side slopes in each Phase.

4.1.3 Construction Quality Assurance (CQA)

A CQA Plan will be used during construction of critical landfill design and environmental protection features to assure that construction is completed in accordance with the approved design. The CQA Plan for the landfill is provided in Appendix P. During construction and development of all portions of the UWL, Ameren Missouri will assure that the contractor follows the CQA plan by retaining a qualified third party CQA consultant.

4.1.4 Survey Control

Survey control will be utilized during construction and operation of the landfill to assure that the operation is conducted within the horizontal waste boundaries of the permitted utility waste disposal area and the fill height limitations approved by MDNR. Property boundaries and permanent horizontal and vertical survey control points have been established within the immediate vicinity of the UWL permit boundary for this purpose. A survey plat showing the UWL permit and waste boundaries, as well as legal descriptions of each of these boundaries is included in Appendix V.

The tract of land totaling 813 acres is the proposed UWL permit boundary. The proposed waste boundary totals approximately 166.5 acres. The waste boundary will be identified in the field at the time of construction of each Phase. The waste boundary is located at the inside top

of the perimeter berm. The Labadie UWL is constructed almost entirely above surrounding grades with disposal Phases defined by the perimeter berms. Additional identification of permitted waste boundary using steel "guard posts" is neither practical nor necessary in the configuration used for this UWL.

Elevation control for the landfill operation will be implemented in accordance with the survey control provisions specified in Section 2.10. Elevation controls will be utilized to monitor all construction, including: the initial site preparation; composite liners; leachate collection systems; intermediate landfill operations, grading and temporary cover; and final cover system.

After receiving authorization to operate a newly constructed disposal area, the inside top of the exterior perimeter berms containing the outside edge of the composite liner system anchor will designate the permitted waste boundaries. Construction stakes, consisting of wooden hubs and lath, will be used to control ongoing construction of the landfill where needed. Landfill staff will conduct elevation checks at a minimum of once every six months to keep the ongoing construction of the landfill within permitted horizontal and vertical boundaries. The project coordinate system shown on all pertinent drawings has been developed to assist in this effort. Landfill staff will have the equipment and information necessary to check construction progress as necessary. If they require assistance, they will contract with a registered land surveyor.

Both during operation and post-closure, the top of berm elevation will be periodically determined by level survey. If the elevation of the exterior berms settles below the 500-year elevation of 487.6, suitable fill will be added to the perimeter roads on the top of the berm to raise the minimum berm elevation to 488.0. Ameren Missouri will estimate the remaining permitted volume of the landfill every two years, as required. This estimate will be made by comparing photogrammetric surveys of the active portion of the site or by other means approved by the MDNR.

4.2 Operational Description

Landfill personnel must be familiar with the area method of landfill disposal concepts and daily operational requirements for the UWL in order to meet regulatory requirements on an on-going basis. This section provides a general overview of the area method of landfill disposal area operating procedures that will be followed by the landfill personnel.

4.2.1 UWL Disposal Operational Description

Utility waste CCPs from the Labadie Energy Center will initially be hauled by truck from the plant or the fly ash and bottom ash ponds to the active Phase of the UWL. Transportation will be on a new plant access road constructed to minimum elevation 486 to provide all weather access. Internal temporary roads will be constructed on the CCPs as needed in the active Phase to deliver the CCPs to the active working face. A bulldozer, tracked loader or other suitable earth moving equipment will be used to spread and compact the CCPs on the working

face.

The slope of the working face should not be steeper than 33% and the CCPs should be compacted in layers no greater than 2 feet in thickness. Generally, the disposal areas will be filled in vertical lifts 8 to 10 feet in height, with the waste confined to the smallest practicable area and compacted to the smallest practicable volume. The final landfill exterior side slopes will not exceed 33% slope (3:1, H:V). The vertical lifts will be staggered to promote stormwater runoff with minimal erosion and to provide easy truck access and traffic flow while maintaining an orderly sequence of fill within the active portion of the lined disposal area. The CCPs will be moisture conditioned to promote compaction and to provide dust control. The operator will add moisture to the CCPs deposited at the active working face by spraying water directly onto the waste as needed. If necessary, moisture content will be lowered by aerating the CCPs by disking or grading the CCPs on the working face.

The stormwater ponds as well as the perimeter ditch around each phase will provide storage for stormwater runoff management from closed and active disposal areas. Stormwater that has been in contact with CCPs in the disposal area will be collected and conveyed to the closest stormwater pond. Runoff will be utilized as described in Section 3.1.3.

4.2.2 Flood and Liquefaction Impact Mitigation Plans

The UWL is located in the floodplain of the Missouri river and will be protected first by an existing agricultural levee and second by perimeter flood protection berms. In the unlikely event that floodwaters exceed the agricultural levee and submerge the exterior of the perimeter berm surrounding active Phase of the UWL, the differential between the exterior flood water elevation and the interior CCP elevation creates potential uplift pressure on the bottom liner. Unmitigated, this pressure could damage the composite liner integrity. As described in detail in Section 3.3.2.2, CCP 'ballast' placed on top of the composite liner will effectively counterbalance and mitigate the potential uplift pressures during a flood event.

The ballast will be provided by in-place CCPs. The CCP ballast should be maintained no lower than 5.5 feet below the floodwater elevation outside the perimeter flood protection berm to counterbalance this uplift pressure.

For each Phase of development of the UWL, the operation plan is to accelerate the rate that CCPs are disposed in a newly constructed disposal area until the area is filled to elevation 478.5, 5.5 feet below the Base Flood Elevation. At an average daily disposal rate of 10,000 CY per day, the largest sub-area can be filled to elevation 478.5 in approximately 58 working days, or approximately 2 months. If a 100-year flood event is predicted early in the operational life of a newly constructed disposal area, the daily disposal rate will be increased to the extent required until the area is filled to elevation 478.5. In the event of an extreme emergency, the disposal area will be flooded with non-potable water to elevation 478.5 or higher to prevent uplift damage to the liner.

To protect the composite liner in the stormwater ponds from potential uplift, no more than 3.3 feet of differential hydrostatic uplift pressure will be allowed between the inside and outside of the berms (reference Appendix J). During a 100-year flood event (el. 484), the operating water level in the stormwater ponds will be maintained at el. 480.7. The maximum differential uplift pressure will be controlled by one 24-inch culvert pipe at approximate el. 472 through the perimeter berm of each pond to allow flood water to rapidly flow into the ponds. Each pipe will have a gate and check valve to prevent discharges from the pond during normal operating conditions. During a predicted significant flood event and once the level of the flood water on the exterior berm exceeds el. 473 the gate valves will be opened allowing the water inside the pond to equalize with the flood elevation on the perimeter berm exterior. When the water in the pond is high enough to mitigate the uplift pressure from an anticipated flood event, the gate valves will be closed to prevent discharge from the ponds.

As determined in Section 2.8.5, the UWL site is located within a seismic impact zone. Before sufficient fill has been placed to eliminate the risk of liquefaction, there is a slight risk of damage to the partially completed berms and composite liner that could result from the lateral spreading, settlement or formation of sand boils. The minimum threshold ground acceleration for this potential situation is 0.10g. Therefore, if a seismic event would occur with a ground acceleration greater than 0.10 g before sufficient berm or CCP fill had been placed, then an investigation will be completed to determine whether the composite liner has been damaged. This condition is discussed in more detail in Section 6.1.3 of Appendix J.

This investigation will be completed in stages. The initial stage will consist of an topographic survey of the perimeter berms in those areas indicated in Figure D-3 of Appendix J, as being potential areas of liquefaction. The survey will determine whether settlement or lateral movement has occurred. Also, the area outside of the perimeter berms will be visually examined for evidence of settlement, lateral movement and/or sand boils. If there is evidence of liquefaction from the initial investigation, then the bottom composite liner will be surveyed in the adjacent storm water pond, to compare with the final survey of the completed liner.

Under these circumstances, the composite liner in the adjacent storm water pond will also be examined for damage. If there is evidence of heave (due to sand boils), differential settlement or damage to the liner, then the final stage will be to remove CCP in the affected area of the cell to examine the composite liner for similar evidence of damage. Any damaged area of the composite liner will be removed and replaced.

4.3 Solid Waste Accepted

Solid wastes accepted and excluded at the UWL are regulated under 10 CSR 80-11.010(2) and (3) enforced by the MDNR's Solid Waste Management Program. Utility waste accepted at the landfill will meet both the state and county requirements for UWLs.

Utility waste will be accepted in accordance with the approved design and operational plan, with

no need for additional evaluation or consideration. By State regulation, UWLs may only accept: fly ash, bottom ash, boiler slag or other slag waste and flue gas emission control waste generated primarily from the combustion of coal or other fossil fuels. Clean fill may also be accepted. The byproduct materials produced by the FGD scrubber process are included in this list of acceptable wastes under the State regulations.

Access to the solid waste operation will be controlled by perimeter fencing with one (1) gated, primary access point near the northwest corner of Phase 1, as generally depicted on the drawings. There will be a minimum of two additional gated access points around the UWL that allow operation and maintenance personnel access to the UWL disposal areas. The final location and configuration of the all-weather access road into the Phase 1 disposal area will be determined by Ameren Missouri. In compliance with the state Solid Waste Management Regulations, a sign will be displayed at the entrance to the landfill containing the following information in letters at least two and one half (2.5) inches high and one-half (1/2) inches wide:

“LABADIE ENERGY CENTER
UTILITY WASTE LANDFILL

THE UTILITY WASTE LANDFILL WILL BE AVAILABLE FOR THE
DISPOSAL OF ACCEPTABLE WASTES DURING HOURS OF ENERGY
CENTER OPERATION.

EMERGENCY CONTACT: CALL THE OPERATING SUPERVISOR AT 314-
992-8233.

THE UTILITY WASTE LANFILL IS OPERATED UNDER MISSOURI SOLID
WASTE DISPOSAL AREA OPERATING PERMIT: NO. _____ ISSUED
BY THE MISSOURI DEPARTMENT OF NATURAL RESOURCES.

THE UTILITY WASTE LANDFILL WILL ACCEPT WASTES GENERATED
BY THE LABADIE ENERGY CENTER AND ALLOWED UNDER 10 CSR 80-
11.010(2)(A), INCLUDING, BUT NOT LIMITED TO: FLY ASH, BOTTOM
ASH, FLUE GAS SCRUBBER BYPRODUCTS, AND CLEAN FILL.”

The normal hours of operation and emergency telephone numbers will also be posted. Normal operating hours are 24 hours per day, seven days a week, throughout the entire year Figure 3 provides a suitable entrance sign detail for the UWL delivery entrance at the northwest corner of Phase 1.

Operations personnel will control unauthorized access to the UWL. A record of all incidences of unauthorized access will be maintained in the UWL operating records. At the conclusion of each operating day, the UWL staff will lock the entrance gate to prohibit vehicle access when staff is not present.

4.4 Solid Waste Excluded

Phases 1 through 4 of the UWL are designed to accept only CCPs directly from the Labadie Energy Center. CCPs include fly ash, bottom ash, slag, FGD byproducts and clean fill generated by the Labadie Energy Center. The following materials will not be knowingly accepted for disposal at the landfill under any circumstances:

- Hazardous Waste, including PCB Waste
- Infectious Waste
- Municipal Solid Waste, including putrescible waste
- Yard Waste
- Any Appliances
- Lead-Acid Batteries
- Waste Oil
- Waste Tires
- Liquids or Semisolids
- Explosive, Flammable or Volatile Wastes
- Raw Animal Manure, Sewage Sludge or Septic Tank Pumpings
- Dead Animals

Any waste identified as unacceptable or as a special waste not previously approved in accordance with MDNR procedures will not be accepted. In the UWL disposal operating areas, utility waste will be delivered by truck from the Ameren Missouri Labadie Energy Center. The likelihood of unacceptable waste being trucked to the disposal area is minimal. However, the disposal area equipment operator will visually screen incoming haul trucks as they unload at the active working face for unacceptable waste materials in their load. Trucks hauling unacceptable waste will not be allowed to unload and will be directed to return to the plant to manage the waste in accordance with the plant waste management practices. Unacceptable wastes inadvertently unloaded at the UWL active working face will be reloaded into empty trucks for return to the plant to be managed in the plant waste management system as appropriate.

4.5 Water Quality

The UWL will be managed to protect surface water and groundwater quality. The UWL has been designed as a no-discharge water management system for rainfall events below the 25-year, 24-hour storm event.

Surface stormwater runoff from the UWL will be collected and routed via the perimeter ditch to on-site stormwater ponds (discussed previously in Section 3.7). Stormwater will be managed to minimize erosion of all Phases of the active and closed UWL. During active operations, stormwater accumulated in the on-site stormwater ponds that cannot be reused on the UWL site for dust control or CCP moisture conditioning will be conveyed back to the Labadie Energy

Center for management through the NPDES permit. In the NPDES operating permit renewal application dated December 22, 2011, Ameren anticipated excess stormwater flows from the UWL will be routed through the plant and ultimately discharged through Outfall 002. Prior to beginning construction, Ameren will file appropriate NPDES permit modifications to assure timely receipt of the required authorizations. Copies of all future NPDES permit correspondence related to the UWL will be submitted to the Solid Waste Management Program.

Leachate collected in the leachate collection system (discussed previously in Section 3.9) will be temporarily stored in tanks located within the solid waste disposal boundary. Plan Sheets 6, 7, 8 and 9 show the general location of a single leachate storage tank for each cell, although there is sufficient room for several tanks at each location. Leachate will also be reused for ash conditioning, as a dust suppressant within the permitted boundary of the active disposal areas, or conveyed to the Labadie Energy Center for management.

Groundwater monitoring (discussed previously in Section 3.10) will be implemented throughout the operational life of the UWL, and following closure, to assure that environmental control systems related to water quality are functioning as designed, and that the groundwater is protected.

4.5.1 Stormwater Management

During the facility's operating life, stormwater will be collected in the perimeter ditch and routed to on-site stormwater ponds. The collected stormwater will be utilized as described in Section 3.1.3.

Stormwater controls were described in Section 3.7 and Appendix N. Temporary berms will be constructed to minimize erosion. Diligence in construction of temporary berms and ditches during active construction and operation of the landfill will assure that stormwater run-on will not contact the utility waste.

Stormwater runoff at the site is also controlled by the orderly and sequential operation of the landfill. The proposed final grading plan and stormwater structures will maintain site perimeter drainage patterns similar to the operating conditions, while dividing the completed landfill drainage patterns into smaller, manageable drainage areas. Side slope benches with slopes of approximately 1% constructed at approximate elevation 520 will convey stormwater from the upper portion of the 3:1 (H:V) side slopes to letdown structures.

Stormwater collected on top of the closed landfill will drain to strategically located perimeter letdown structures that convey it to the base of the landfill in a controlled manner. The stormwater runoff on the side slopes will be intercepted mid-slope by diversion benches and directed to permanent let down structures. The permanent let down structures will either flow into the perimeter ditch or over the top of the perimeter berm for release at the base of the

UWL.

Erosion control measures will be implemented during all periods of construction. A stormwater pollution prevention plan (SWPPP) will be developed and implemented as required by the site development land disturbance codes. A hardy vegetative cover will prevent erosion of final grades that are less than 33%. A hardy vegetative cover will also prevent erosion on final stormwater channels with slopes less than 2%. For stormwater channels with steeper grades and/or higher water velocities, riprap or commercially available erosion control products will be used to prevent erosion in the drainage ways. The completed portions of the landfill will be closed by phase within 180 days of reaching final elevation. Following landfill closure, uncontaminated stormwater runoff from the top and side slopes of the UWL will be discharged through a series of stormwater let down structures. The stormwater runoff will be directed over the perimeter ditch and perimeter berm and discharged at the exterior base of perimeter berm. Following proper closure, all uncontaminated stormwater runoff will be controlled and monitored to assure that state and county water quality standards are met.

4.5.2 Leachate Management in the UWL

A continuous leachate collection drainage layer will be installed on top of the composite liner system at the bottom of the waste disposal area in each Phase of the UWL. The leachate collection drainage layer will collect and convey leachate generated to a sump in each internal drainage area. Each sump will be accessed by a side slope riser discharge pipe placed on the interior slope of the perimeter berm and accessed at the top of berm. Each sump will be equipped with an automated submersible pump. Leachate removed from the active disposal area will be temporarily stored on-site in tanks and utilized as described in Section 3.1.3 and Section 3.9.2. The average annual quantities anticipated were estimated using the HELP model (reference Appendix O) and are summarized in Section 3.9.

4.5.3 Groundwater Sampling and Analysis Plan

The current state requirements for groundwater monitoring are contained in 10 CSR 80-11.010(11). A Groundwater Sampling and Analysis Plan is included as Appendix Q. The Groundwater Sampling and Analysis Plan can be removed and used as a separate document. Ameren Missouri will conduct routine groundwater sampling and analysis in accordance with the most current approved Groundwater Sampling and Analysis Plan for the UWL.

As previously described in Section 3.10.2, an existing agricultural irrigation well northeast of Cell 3 will remain operational during operation of the UWL, and when used, will operate at a reported estimated maximum rate of 1,200 gpm. This well will only operate periodically during periods of dry weather, typically for durations of up to four days. The periodic operation of this well will have unmeasurable impacts on the groundwater levels in the adjacent groundwater monitoring wells. It is recommended that groundwater sampling occur a minimum of 24 hours after the agricultural irrigation well was last operated to mitigate any potential impacts on the

adjacent groundwater monitoring wells. Refer to Appendix W(b) for the detailed analysis of the agricultural irrigation well impact.

4.6 Air Quality

Ameren Missouri does not anticipate that any additional air permits are required for the proposed utility waste disposal area. No open burning of waste is anticipated on the property, but appropriate permits and/or approvals will be obtained if it is determined that open burning will be required. The UWL operator will monitor the landfill site conditions to control unacceptable air emissions and take appropriate action when necessary to apply control measures such as adding moisture to work areas for dust control.

4.6.1 Dust Control

Dust control requirements for UWL operation will be minimal. By its nature, the moisture conditioned CCPs will not generate significant fugitive dust emissions during transportation, placement or compaction. The CCPs tend to solidify as they dry out, limiting susceptibility to wind erosion, and, when exposed to precipitation, forms a crust which aides in limiting wind erosion. The primary source of CCP dust will be disturbance from vehicular traffic on interior access roads. When necessary, the internal access roads will be watered and/or stabilized to minimize fugitive dust emissions.

The site access road will be used exclusively to provide access to the landfill and affiliated operations. Perimeter roads at the top and toe of the perimeter flood protection berms will be surfaced with limestone gravel. CCPs transported to the disposal area by truck will be moist to prevent dusting from excessive dryness. The surface of access roads from the plant to the active disposal will be stabilized and maintained as necessary to limit the amount of fugitive dust that can become airborne during hauling operations. Stormwater and leachate will be available for moisture conditioning of UWL, on-site roads, traffic areas and work areas inside the utility waste boundary limits to control dusting during all phases of construction and operation, including mining activities, if and when allowed.

4.7 Aesthetics

The aesthetic condition of the landfill does not impact its ability to protect the environment or the public health. However, the aesthetics do impact the public perception of the landfill. Ameren Missouri will be attentive to site conditions that may become aesthetically displeasing and will implement actions to mitigate the conditions.

4.7.1 General Aesthetics

The landfill is located in a rural area. It is bordered by agricultural and limited residential areas to the east, and south, and the Ameren Missouri Labadie Energy Center to the west. The overall appearance of the landfill will not detract from the agricultural activities of adjacent

property owners, and care will be taken to maintain the existing aesthetics of the area. Vegetative growth will be established on the UWL as discussed in Section 3.12.

4.7.2 Mining for Beneficial Reuse

Any future mining operations for the purpose of removing CCP materials from the UWL for beneficial reuse will be conducted so as not to impact the integrity of the UWL containment system or detract from the general aesthetic of the landfill. Dust control and suppression measures will be implemented as needed during mining activities. Future mining activities of any in-place CCPs will not commence without the written notification and consent of MDNR.

4.8 Equipment and Staffing

The proper implementation of the landfill design and operation requires appropriate equipment and staffing. The equipment and staffing requirements will vary based in part on the volume of CCPs generated by Ameren Missouri. Design features requiring significant construction, such as Phase development, composite liner and leachate collection systems installation and final cover construction, are planned in increments that facilitate utilizing outside contractors to minimize full time equipment and staffing needs.

4.8.1 Primary Equipment

Staffing levels will be adjusted based on the actual volume of waste received. Additional equipment will be leased or purchased, as necessary, should the actual waste volumes received significantly exceed the projected waste volumes.

Equipment supports two main activities: daily landfill operations and closure of sections of the landfill that have reached final grade. In addition, various support activities require heavy equipment. Preparation and construction of the liner and leachate collection system will require additional heavy equipment for the grading, transport, placement, and compaction of construction soil materials. Closure activities require movement, spreading and compacting of soil materials. Agricultural equipment will be needed periodically for preparation of the seedbed for establishing vegetation.

The type and amount of equipment owned by Ameren Missouri will be dependent upon the amount of soil-moving activities contracted through third parties. Equipment for daily landfill operations will be either owned or leased. The management of the Labadie Energy Center will be responsible for the ongoing operation and maintenance of the UWL. It is anticipated that third party contracting will be utilized for initial excavation, liner and leachate collection system construction, final cover placement, grading and seeding.

The following types of equipment may be used on-site for daily operations:

- CAT D-7 Bulldozers, or equivalent

- CAT 953 Tracked Loaders, or equivalent
- Water Trucks (up to 3,000 gallons)
- Four Wheel Drive Pick-Up Trucks
- Pull Behind Pan Scrapers, or equivalent

Each piece of equipment shall be equipped with a fire extinguisher.

This equipment is capable of meeting the daily operation needs for the anticipated volume and operating conditions. As capacities increase, additional soil moving capabilities can be leased or subcontracted, as needed.

Initial site preparation and excavation, liner construction and closure activities may increase the equipment needs of the landfill. Site preparation, liner construction and closure activities will require soil excavation, movement and compaction equipment. Excavation of materials from borrow areas may require track-type dozers and self-propelled scrapers. Final cover construction for closure will require additional equipment such as pads foot rollers or wheeled compactors, a mobile water tank, and an industrial disc or scarifier. Establishment of vegetation will require standard farm equipment, such as tractors, discs and seeders.

The equipment selected for daily operation allows the landfill the flexibility to perform at least some of the closure activities with existing equipment and labor. The landfill will add additional equipment and labor or utilize outside contractors to complete the area preparation and closure. The option selected will depend on factors including economics, quality control, time, and availability of labor and equipment.

If Ameren Missouri decides to perform the individual closure activities internally, the previously mentioned equipment will be added as necessary to supplement the landfill equipment required for daily operation. If all or parts of the closure activities are performed by the landfill, it will have the necessary personnel and equipment. If a contractor is utilized, the contractor will be required to have the necessary experience, personnel and equipment.

4.8.2 Equipment Maintenance

Ameren Missouri staff will perform routine equipment maintenance work and the majority of the repair work. The recommended maintenance programs of the equipment manufacturers will be followed to minimize equipment downtime. Portable service trucks will maintain equipment through fueling, engine oil changes, hydraulic oil changes and lubrication.

A preventative maintenance program will be implemented for the landfill equipment to minimize equipment failure and maximize equipment life. The preventative maintenance program will only be applicable to equipment owned by Ameren Missouri. Leased equipment will be maintained under a service contract with the owner. Maintenance of all equipment belonging to an off-site contractor will be the responsibility of the contractor.

The recommended preventative maintenance program consists of a three-part program including procedures for following the equipment manufacturer's maintenance recommendations, development of a maintenance and repair log for each piece of equipment, and performing scheduled evaluations of the equipment by company maintenance personnel and an equipment dealer.

Landfill equipment maintenance personnel will log equipment hours to implement scheduled maintenance activities. The scheduled maintenance activities will be in accordance with the equipment manufacturer's recommendations. The logs will be checked at the beginning of each week and the appropriate maintenance activities scheduled.

A log will be maintained for each item of equipment. The log will include dates of repairs and maintenance, equipment hours, and descriptions of repairs and maintenance activities. Specific notes of interest concerning the equipment will be included in the log. The history developed in the log will help in scheduling major maintenance and repair.

An evaluation of each item of equipment will be performed on a scheduled basis. At a minimum, the evaluations of each item of equipment will consist of the following:

1) **Daily**

The equipment operator will:

- Check for leaks, broken parts, or excessively worn parts;
- Perform minor maintenance such as fueling, lubrication and cleaning of undercarriage; and
- Observe overall condition of equipment.

2) **Weekly**

- Landfill equipment maintenance personnel will perform a more thorough overall evaluation of equipment for needed repairs and maintenance.

3) **Semi-Annual**

- Landfill equipment maintenance personnel will perform a detailed evaluation of the equipment for minor and major repairs and/or maintenance. This evaluation will be part of a scheduled maintenance activity.

4) **Annual**

- An equipment dealer or competent mechanic will perform a detailed evaluation of the equipment. An evaluation of necessary major repairs will be made at this time. Major repairs will be scheduled and timely performed.

4.8.3 Back-Up Equipment

Backup equipment is needed at the UWL for grading the utility waste and movement and placement of soil cover during periods when a piece of primary equipment is out of service. The service agreements for leased equipment typically provide for replacement equipment if repairs take more than three (3) days to complete.

It is not necessary to have an active agreement with an equipment dealer to provide equivalent substitute equipment in case of emergency for two (2) reasons. First, the Labadie Energy Center has redundant pieces of equipment for use in most emergency situations. Second, the landfill's proximity to the St. Louis metropolitan area assures an adequate supply of equipment dealers and contractors who are willing and able to supply equipment to the landfill on short notice. Substitute equipment from local suppliers can typically be available within twenty-four (24) hours to provide uninterrupted service at the landfill.

4.8.4 Staffing

Based on the anticipated volumes of waste received during the first year or more of operations, the anticipated staffing level includes:

- Landfill Manager/Operator
- Two (2) Landfill Equipment Operators
- One (1) General Equipment Operator

At a minimum, one heavy equipment operator will be required for the UWL landfill area method of disposal, and one operator is needed for traffic control and truck spotting at the open working face, and dust control and general site maintenance and upkeep. Part-time, general laborers and contractors will be utilized, as needed, to meet additional operational needs of the landfill. General Job titles and duties of landfill personnel are summarized as follows:

- Landfill Manager; responsible for daily operations of the landfill, overall responsibility for operation and maintenance of heavy equipment and overall landfill compliance. The person in this position shall be a Certified Solid Waste Technician and trained in the identification of unacceptable wastes.
- Landfill equipment operator/spotter; a landfill excavator operator/spotter responsible for grading utility waste and identifying and removing unacceptable waste. These positions will be managed by the Landfill Manager. Although not required, it is recommended that persons in this position be a Certified Solid Waste Technician trained in the identification of unacceptable wastes. Staff in these positions can serve in the role of landfill Manager during the manager's temporary absence.
- General equipment operator; a general equipment operator is responsible for operation and maintenance of various types of equipment and other duties under the direction of the Landfill Manager. This person also acts as a substitute equipment operator. Although not required, it is recommended that persons in this position be a Certified Solid Waste Technician trained in the identification of unacceptable wastes.
- General laborer; a laborer will be available for duties as assigned to assure the landfill operates in compliance with state and county requirements.

The landfill manager and at least one other employee of the landfill will be Certified Solid Waste Technicians. The second Certified Solid Waste Technician will be qualified to serve the role of landfill manager during the manager's absence. At a minimum, the landfill manager, excavator operator and other staff working on the active landfill will be trained in the identification of unacceptable wastes.

The anticipated staffing levels, combined with equipment specified for the projected maximum CCP disposal, provide the basis for a complete and efficient operation. If it is determined to permanently or temporarily add heavy equipment at the site due to increased waste volume or landfill area preparation or closure activities, additional equipment operators may be necessary.

4.9 Final Cover Material

Final cover material will be obtained from stockpiles of vegetative soil initially stripped from within the UWL footprint. The quantity and quality of available final cover material is addressed in Section 3.11. The soils required for final cover are generally characterized as a vegetative soil. Soil stockpiles will never be located on top of any constructed final cover, and will always be situated so that they do not impede stormwater drainage. If the stockpiles will be idle for more than thirty (30) days, they will be seeded with a temporary vegetative cover to minimize sediment discharge with stormwater runoff. Additional Best Management Practices will be implemented for soil stockpiles, as required to control erosion and sedimentation. All on-site and off-site areas used for soil borrow will be regraded, seeded, fertilized, and mulched for reclamation when they are no longer in use.

Construction of the final cover system is detailed in Section 3.12. The final cover on areas with slopes less than 5 percent will consist of a single-sided textured 40-mil geomembrane liner, overlain by a 16 oz/yd² non-woven, needle-punched geotextile, covered with two (2) feet of nominally compacted soil. On the exterior side slopes of the UWL, the final cover design will consist of a textured, 40-mil geomembrane liner, overlain by a 16 oz/yd² non-woven, needle-punched geotextile, covered with two (2) feet of nominally compacted soil capable of supporting the final vegetative cover. The top 24 inches of soil material for the top and side slopes of the UWL will be nominally compacted to enhance its ability to support vegetation on the final cover.

Completion of the final cover will require proper weather conditions. In general, when approximately forty (40) acres are filled to within two (2) feet of the final elevation, construction of that section of final cover will be scheduled as soon as practical. Whenever possible, construction will be timed to coincide with a time of year conducive to establishing vegetation. Liming, fertilizing, seeding and mulching will be completed as soon as practical after construction of a portion of the final cover. A minimum seeding rate of seventy-five (75) lbs/acre of the specified seed mixture will be applied. In any case, vegetation will be established within 180 days of reaching final elevations.

Silt fence, straw bales or other acceptable Best Management Practices will be used during the

initial establishment of vegetation. Any areas that have settled, are severely eroded, or on which previously planted vegetation did not survive will be recovered, regraded or reseeded, as necessary, to maintain cover slope and integrity.

All of the proposed landfill slopes are designed to be no steeper than 3:1 (H:V) to accommodate slope maintenance (e.g., erosion repair, reseeded and mowing).

The erosion evaluation of the final grading plan indicates that only one stormwater diversion bench is required on the exterior side slopes of the landfill to provide managed and controlled removal of precipitation runoff from the completed landfill while controlling erosion. The spacing of the diversion bench is designed to provide a stable 3:1 slope for easy maintenance of the final cover. None of the final side slopes are designed to exceed 3:1 maximum. The diversion bench is designed to carry stormwater off the landfill while minimizing erosion of the drainage channels (Appendix N). The design details for the final stormwater drainage plan are discussed in Section 3.7.

If establishing vegetation and stabilizing the slopes is difficult to maintain after closure, small, temporary diversion berms will be constructed with mulch or other suitable materials in the problem area perpendicular to the flow of water. These temporary diversion berms can be constructed to drain at an approximate 1% slope to the nearest stormwater let down structure. The construction of the small, temporary diversion berms will further reduce the length of the side slopes of the landfill, further decreasing erosion of the final cover.

Small quantities of the soil materials to be used for final cover will be stockpiled in temporary locations strategically located out of the way of ongoing operations and final cover.

After the facility is closed, the final cover will be inspected quarterly for stressed vegetation, poor vegetative coverage and erosion of final cover. The vegetative cover shall be routinely maintained to promote a healthy vegetative cover and to prevent the growth of trees. As necessary and indicated by the quarterly inspections, the soil will be tested to determine if fertilizer or other nutrients are recommended to improve the vegetative cover. Areas that have become eroded or lack hardy vegetative cover will be repaired with additional soil, fertilizer and/or seed.

4.10 Compaction

The UWL disposal area will require a minimum of one dozer to spread and compact the CCPs as received by truck haul on a daily basis. Spreading the waste in a layer not more than two (2) feet thick on a 3:1 slope and making two to three passes with the dozer should provide sufficient compaction of the CCPs to form a stable lift of waste eight (8) to ten (10) feet thick (vertically). Moisture conditioning will be used as needed to optimize spreading and compaction and to prevent dusting.

4.11 Safety

Routine vehicular access to the landfill for delivery of CCPs will be limited to one gated access point. The primary gate for the disposal process is located at the northwest corner of Phase 1, as shown on the drawings. Visitors and CCP haul trucks will use this access point. The primary access gate will be locked when the landfill is not open. Two additional secondary gated access points are planned. The secondary access points will be limited to landfill staff and Ameren Missouri personnel. These access gates will be locked whenever not in use.

Fire extinguishers will be located on all landfill equipment. Communication equipment used at the landfill will consist of two-way radios. Two-way radios will be assigned to personnel, not equipment. This ensures all staff has communication equipment on their person at all times and provides direct access to the Ameren Missouri Labadie Energy Center office. Appendix S contains a list of agencies, individuals and telephone numbers for emergency contact.

4.12 Records

The landfill will maintain the documents and records required by state and county regulation. Records will be maintained on-site at the plant offices for a minimum of five (5) years. After records are over five (5) years old, they may be retained at an alternate site, but will be made available to MDNR representatives upon request.

At a minimum, the following records will be kept as per 10 CSR 80-11.010(17):

- Major operational problems, complaints, or difficulties
- Groundwater monitoring results
- Any demonstrations, certifications, finding, monitoring, testing or analytical data required under 10 CSR 80-11.010(9)
- Dust control efforts
- Quantitative measurements of the waste handled and an estimate of the air space remaining in the landfill. These measurements are to be submitted by January 31 in even-numbered years.
- Closure plans and other information, as required under 10 CSR 80-2.030(4)(A)
- Closure cost estimates and financial assurance documentation, as required under 10 CSR 80-2.030(4)(B) and (C)
- Inspection records, training procedures and documentation of training, as required under 10 CSR 80-2.060 and 10 CSR 80-11.010(3)(B)
- Records associated with any future corrective measures, as required by 10 CSR 80-11.010(11)

Logbooks, ledgers and reporting forms will be utilized at the landfill site to record daily events. Example recordkeeping and reporting forms for use by the landfill are provided in Appendix T.

The landfill will conduct a photogrammetric topographic survey at least once every two years to

accurately determine the volume of waste disposal. Within 60 days of the anniversary date of the permit and following the topographic survey, two copies of a topographic map prepared under the direction of a registered land surveyor will be submitted to MDNR. The topographic contour maps shall conform to the specifications outlined in 10 CSR 80-11.010(17)(C)1.D.

**Detailed Site Investigation
Proposed Utility Waste Disposal Area
Ameren Missouri Labadie Power Plant
Franklin County, Missouri**

**Monthly Groundwater Monitoring Data
Table 3**

Piez.	Date	Location		Ground		Top Casing		DATE OF MEASUREMENT																												Maximum Variability (ft)
								December 21, 2009		January 25, 2010		February 16, 2010		March 16, 2010		April 13, 2010		May 11, 2010		June 8, 2010		July 7, 2010		August 5, 2010		September 8, 2010		October 7, 2010		November 4, 2010						
								ID	Drilled	Northing	Easting	Elev. (ft)	Elev. (ft)	Depth (ft) ¹	Elev. (ft)																					
1	3/14/2007	996170	727590	470.7	473.92	16.42	457.50	15.72	458.20	15.40	458.52	12.00	461.92	10.67	463.25	12.06	461.86	9.49	464.43	9.46	464.46	10.95	462.97	13.74	460.18	11.73	462.19	15.31	458.61	6.96						
2	3/12/2007	993371	728606	466.4	469.59	10.70	458.89	10.18	459.41	10.26	459.33	8.97	460.62	6.50	463.09	7.51	462.08	5.61	463.98	5.80	463.79	6.82	462.77	9.00	460.59	7.20	462.39	10.29	459.30	5.09						
3	3/12/2007	990179	728523	466.1	469.85	9.67	460.18	8.77	461.08	9.46	460.39	8.69	461.16	6.52	463.33	7.29	462.56	5.91	463.94	6.35	463.50	6.98	462.87	8.63	461.22	6.98	462.87	9.85	460.00	3.94						
9	10/20/09	996108.40	726981.78	469.90	473.26	16.83	456.43	14.44	458.82	15.34	457.92	11.14	462.12	10.00	463.26	11.64	461.62	8.69	464.57	8.66	464.60	10.30	462.96	13.46	459.80	11.28	461.98	15.15	458.11	8.17						
12	09/16/09	996215.71	728171.12	468.95	472.14	14.33	457.81	14.20	457.94	13.44	458.70	11.94	460.20	8.99	463.15	10.39	461.75	7.95	464.19	7.95	464.19	9.36	462.78	12.05	460.09	9.99	462.15	13.43	458.71	6.38						
15	09/17/09	995802.44	727271.36	469.35	472.40	15.23	457.17	13.77	458.63	14.02	458.38	11.12	461.28	9.08	463.32	10.64	461.76	7.91	464.49	7.99	464.41	9.35	463.05	12.37	460.03	10.25	462.15	13.94	458.46	7.32						
17	09/16/09	995789.75	727851.61	469.30	472.19	14.38	457.81	13.86	458.33	13.49	458.70	11.67	460.52	8.96	463.23	10.35	461.84	8.03	464.16	7.96	464.23	9.30	462.89	11.98	460.21	9.96	462.23	13.44	458.75	6.42						
19	10/16/09	995768.95	728438.40	467.90	470.84	12.44	458.40	12.75	458.09	11.88	458.96	11.03	459.81	7.73	463.11	8.99	461.85	6.75	464.09	6.81	464.03	8.07	462.77	10.60	460.24	8.56	462.28	11.85	458.99	6.00						
20	09/17/09	995510.59	726856.24	469.35	472.28	15.26	457.02	13.34	458.94	13.95	458.33	10.74	461.54	8.89	463.39	10.47	461.81	7.62	464.66	7.79	464.49	9.22	463.06	12.22	460.06	10.09	462.19	13.85	458.43	7.64						
22	10/07/09	995503.30	727579.54	468.40	471.27	13.57	457.70	12.68	458.59	12.63	458.64	10.47	460.80	8.01	463.26	9.44	461.83	6.87	464.40	6.75	464.52	8.36	462.91	11.16	460.11	9.02	462.25	12.52	458.75	6.82						
24	09/16/09	995476.21	728133.29	468.50	471.44	13.17	458.27	13.10	458.34	12.50	458.94	11.22	460.22	8.27	463.17	9.58	461.86	7.28	464.16	7.33	464.11	8.60	462.84	11.13	460.31	9.11	462.33	12.48	458.96	5.89						
27	09/17/09	995206.06	727247.55	469.07	471.99	14.36	457.63	13.08	458.91	13.31	458.68	10.88	461.11	8.60	463.39	10.07	461.92	7.43	464.56	7.66	464.33	8.95	463.04	11.81	460.18	9.67	462.32	13.30	458.69	6.93						
29	09/15/09	995188.03	727844.69	467.73	470.83	12.74	458.09	12.07	458.76	11.95	458.88	10.17	460.66	7.62	463.21	8.91	461.92	6.50	464.33	6.69	464.14	7.93	462.90	10.54	460.29	8.53	462.30	11.92	458.91	6.24						
31	10/12/09	994921.76	726950.89	467.67	470.22	12.57	457.65	11.11	459.11	11.43	458.79	9.00	461.22	6.78	463.44	8.26	461.96	5.65	464.57	5.84	464.38	7.15	463.07	9.95	460.27	7.84	462.38	11.45	458.77	6.92						
33	09/14/09	994910.34	727559.71	468.44	471.18	13.16	458.02	12.10	459.08	12.29	458.89	10.31	460.87	7.90	463.28	9.22	461.96	6.79	464.39	6.71	464.47	8.20	462.98	10.84	460.34	8.80	462.38	12.27	458.91	6.45						
35	09/15/09	994886.38	728125.58	467.61	470.61	12.16	458.45	11.76	458.85	11.58	459.03	10.21	460.40	5.53 ³	465.08	8.72	461.89	6.46	464.15	6.68	463.93	7.83	462.78	10.29	460.32	8.32	462.29	11.61	459.00	5.70						
36	09/15/09	995058.28	728509.44	468.20	471.23	12.49	458.74	12.64	458.59	12.07	459.16	11.20	460.03	8.14	463.09	9.28	461.95	7.11	464.12	7.33	463.90	8.47	462.76	10.83	460.40	8.86	462.37	12.06	459.17	5.53						
38	09/22/09	994618.74	727238.62	467.15	470.11	12.11	458.00	10.84	459.27	11.22	458.89	9.20	460.91	6.83	463.28	8.21	461.90	5.79	464.32	5.99	464.12	7.17	462.94	9.82	460.29	7.79	462.32	11.22	458.89	6.32						
40	10/12/09	994582.15	727832.47	467.05	469.93	11.60	458.33	10.69	459.24	10.90	459.03	9.27	460.66	6.79	463.14	8.02	461.91	5.85	464.08	5.98	463.95	7.11	462.82	9.59	460.34	7.65	462.28	10.92	459.01	5.75						
42	10/06/09	994538.42	728420.83	467.74	470.60	11.93	458.67	11.61	458.99	11.41	459.19	10.36	460.24	7.52	463.08	8.65	461.95	6.62	463.98	6.76	463.84	7.85	462.75	10.23	460.37	8.27	462.33	11.39	459.21	5.31						
43	09/17/09	994333.02	726945.21	466.07	469.20	11.07	458.13	10.03	459.17	10.10	459.10	7.94	461.26	5.76	463.44	7.12	462.08	4.59	464.61	4.88	464.32	6.09	463.11	8.70	460.50	6.79	462.41	10.16	459.04	6.48						
45	09/18/09	994324.97	727532.26	467.12	470.07	11.78	458.29	10.77	459.30	11.01	459.06	9.22	460.85	6.84	463.23	8.12	461.95	5.79	464.28	6.06	464.01	7.19	462.88	9.66	460.41	7.77	462.30	11.09	458.98	5.99						
47	09/18/09	994320.66	728124.52	467.10	469.86	11.36	458.50	10.63	459.23	10.77	459.09	9.26	460.60	6.79	463.07	7.96	461.90	5.75	464.11	5.98	463.88	7.12	462.74	9.49	460.37	7.64	462.22	10.82	459.04	5.61						
49	10/14/09	994499.84	728938.97	467.58	470.56	11.61	458.95	11.54	459.02	11.32	459.24	10.48	460.08	7.50	463.06	8.60	461.96	6.67	463.89	6.82	463.74	7.90	462.66	10.11	460.45	8.19	462.37	11.21	459.35	4.94						
51	10/14/09	994463.37	729490.00	466.25	469.06	9.98	459.08	10.08	458.98	9.83	459.23	9.17	459.89	6.18	462.88	7.13	461.93	5.29	463.77	5.47	463.59	6.52	462.54	8.64	460.42	6.76	462.30	9.67	459.39	4.79						
53	10/15/09	994428.21	730049.96	466.46	469.10	9.87	459.23	10.23	458.87	9.87	459.23	9.46	459.64	6.38	462.72	7.29	461.81	5.49	463.61	5.69	463.41	6.70	462.40	8.71	460.39	6.90	462.20	9.71	459.39	4.74						
55	10/14/09	994395.43	730584.11	467.33	470.02	10.60	459.42	11.23	458.79	10.82	459.20	10.63	459.39	7.44	462.58	8.26	461.76	6.60	463.42	6.79	463.23	7.72	462.30	9.61	460.41	7.90	462.12	10.59	459.43	4.63						
57	10/15/09	994356.77	731212.53	465.99	468.87	9.35	459.52	10.03	458.84	9.68	459.19	9.58	459.29	6.47	462.40	7.22	461.65	5.66	463.21	5.86	463.01	6.77	462.10	8.54	460.33	6.89	461.98	9.46	459.41	4.37						
59	09/21/09	994039.34	727225.40	465.36	467.94	9.63	458.31	8.69	459.25	8.00 ³	459.94	6.88	461.06	4.65	463.29	5.92	462.02	3.50	464.44	3.88	464.06	4.95	462.99	7.48	460.46	5.61	462.33	8.91	459.03	6.13						
61	10/26/09	994020.22	727813.31	465.92	468.87	10.42	458.45	9.50	459.37	9.71	459.16	8.02	460.85	5.68	463.19	6.85	462.02	4.63	464.24	4.82	464.05	5.98	462.89	8.36	460.51	7.64 ³	461.23	9.75	459.12	5.79						
63	09/21/09	994004.98	728407.71	466.20	469.10	10.44	458.66	9.86	459.24	9.91	459.19	8.58	460.52	6.08	463.02	7.18	461.92	5.04	464.06	5.32	463.78	6.40	462.70	8.69	460.41	6.87	462.23	9.96	459.14	5.40						
65	10/13/09	993990.81	729165.61	468.06	471.31	12.34	458.97	12.14	459.17	12.10	459.21	11.08	460.23	8.31	463.00	9.34	461.97	7.47	463.84	7.68	463.63	8.70	462.61	10.83	460.48	9.03	462.28	12.01	459.30	4.87						
67	10/13/09	993985.65	729758.28	465.52	468.28	9.11	459.17	9.18	459.10	9.10	459.18	8.35	459.93	5.47	462.81	6.40	461.88	4.63	463.65	4.86	463.42	5.83	462.45	7.85	460.43	6.10	462.18	8.94	459.34	4.55						
69	10/13/09	993965.46	730346.87	465.05	467.73	8.36	459.37	8.71	459.02	8.52	459.21	8.13	459.60	5.12	462.61	5.98	461.75	4.32	463.41	4.54	463.19	5.50	462.23	7.37	460.36	5.68	462.05	8.41	459.32	4.39						
71	10/21/09	993948.36	730927.90	467.42	470.70	11.12	459.58	11.73	458.97	11.42	459.28	11.20	459.50	8.16	462.54	8.93	461.77	7.35	463.35	7.62	463.08	8.53	462.17	10.27	460.43	8.64	462.06	11.24	459.46	4.38						
73	11/06/09	993742.59	726924.60																																	

**Detailed Site Investigation
Proposed Utility Waste Disposal Area
Ameren Missouri Labadie Power Plant
Franklin County, Missouri**

**Monthly Groundwater Monitoring Data
Table 3**

Piez.	Date	Location		Ground		Top Casing		DATE OF MEASUREMENT																												Maximum Variability (ft)
								December 21, 2009		January 25, 2010		February 16, 2010		March 16, 2010		April 13, 2010		May 11, 2010		June 8, 2010		July 7, 2010		August 5, 2010		September 8, 2010		October 7, 2010		November 4, 2010						
								ID	Drilled	Northing	Easting	Elev. (ft)	Elev. (ft)	Depth (ft) ¹	Elev. (ft)	Depth (ft) ¹	Elev. (ft)	Depth (ft) ¹	Elev. (ft)	Depth (ft) ¹	Elev. (ft)	Depth (ft) ¹	Elev. (ft)	Depth (ft) ¹	Elev. (ft)	Depth (ft) ¹	Elev. (ft)	Depth (ft) ¹	Elev. (ft)	Depth (ft) ¹	Elev. (ft)	Depth (ft) ¹	Elev. (ft)	Depth (ft) ¹	Elev. (ft)	
122	11/10/09	992758.84	729781.01	464.74	467.71	8.40	459.31	8.16	459.55	8.30	459.41	7.61	460.10	4.95	462.76	5.81	461.90	4.04	463.67	4.44	463.27	5.29	462.42	7.22	460.49	5.51	462.20	8.34	459.37	4.36						
124	11/11/09	992775.57	730303.49	464.92	467.99	8.51	459.48	8.50	459.49	8.65	459.34	8.07	459.92	5.37	462.62	6.16	461.83	4.60	463.39	4.90	463.09	5.72	462.27	7.55	460.44	5.88	462.11	8.59	459.40	4.05						
126	11/11/09	992667.51	730879.77	465.77	468.83	9.12	459.71	9.24	459.59	9.40	459.43	9.05	459.78	6.33	462.50	7.05	461.78	5.70	463.13	5.91	462.92	6.67	462.16	8.39	460.44	6.78	462.05	9.33	459.50	3.70						
128	11/07/09	992561.87	727385.52	465.74	468.60	9.91	458.69	9.03	459.57	9.22	459.38	7.39	461.21	5.21	463.39	6.38	462.22	4.20	464.40	4.43	464.17	5.51	463.09	7.91	460.69	6.11	462.49	9.33	459.27	5.71						
130	09/30/09	992537.68	728075.04	465.15	468.13	9.26	458.87	8.51	459.62	8.72	459.41	7.23	460.90	4.93	463.20	5.99	462.14	4.04	464.09	4.28	463.85	5.23	462.90	7.46	460.67	5.70	462.43	8.81	459.32	5.22						
132	10/15/09	992536.17	728817.00	465.36	468.47	9.35	459.12	8.86	459.61	9.10	459.37	9.00 ³	459.47	5.51	462.96	6.50	461.97	4.66	463.81	4.94	463.53	5.88	462.59	7.94	460.53	6.20	462.27	9.20	459.27	4.69						
134	11/10/09	992491.31	729438.21	464.10	466.82	7.51	459.31	7.20	459.62	7.35	459.47	6.52	460.30	3.94	462.88	4.83	461.99	3.13	463.69	3.41	463.41	4.28	462.54	6.26	460.56	4.55	462.27	7.42	459.40	4.38						
136	11/11/09	992488.64	730004.49	463.71	466.73	7.20	459.53	7.06	459.67	7.28	459.45	6.65	460.08	4.00	462.73	4.75	461.98	3.25	463.48	3.53	463.20	4.31	462.42	6.18	460.55	4.56	462.17	7.25	459.48	4.03						
138	11/12/09	992469.33	730675.26	464.10	466.99	7.23	459.76	7.28	459.71	7.51	459.48	7.09	459.90	4.42	462.57	5.11	461.88	3.70	463.29	4.01	462.98	4.74	462.25	6.49	460.50	4.84	462.15	7.45	459.54	3.81						
140	10/27/09	992404.70	731394.93	465.72	468.57	8.69	459.88	8.82	459.75	9.04	459.53	8.95	459.62	6.33	462.24	6.92	461.65	5.67	462.90	5.98	462.59	6.61	461.96	8.22	460.35	6.65	461.92	9.07	459.50	3.40						
142	11/06/09	992250.72	727764.69	464.83	467.66	8.79	458.87	7.90	459.76	8.20	459.46	6.58	461.08	4.39	463.27	5.48	462.18	3.46	464.20	3.63	464.03	4.70	462.96	6.99	460.67	5.20	462.46	8.38	459.28	5.33						
144	09/30/09	992236.95	728361.22	464.56	467.74	8.65	459.09	8.00	459.74	8.24	459.50	7.00	460.74	4.63	463.11	5.61	462.13	3.83	463.91	4.00	463.74	4.93	462.81	7.05	460.69	5.30	462.44	8.34	459.40	4.82						
146	11/09/09	992265.54	729102.62	464.80	467.48	8.20	459.28	7.77	459.71	8.02	459.46	7.09	460.39	4.55	462.93	5.51	461.97	3.79	463.69	4.07	463.41	4.92	462.56	6.92	460.56	5.21	462.27	8.13	459.35	4.41						
148	11/09/09	992252.64	729630.10	463.86	466.84	7.40	459.44	7.10	459.74	7.30	459.54	6.51	460.33	3.96	462.88	4.82	462.02	3.21	463.63	3.51	463.33	4.26	462.58	6.22	460.62	4.52	462.32	7.36	459.48	4.19						
150	11/14/09	992189.21	730256.27	463.22	465.91	6.17	459.74	6.01	459.90	6.34	459.57	5.85	460.06	3.18	462.73	3.94	461.97	2.50	463.41	2.81	463.10	3.51	462.40	5.32	460.59	3.62	462.29	6.36	459.55	3.86						
152	11/12/09	992168.58	730889.93	463.55	466.31	6.32	459.99	6.29	460.02	6.68	459.63	6.45	459.86	3.89	462.42	4.43	461.88	3.18	463.13	3.55	462.76	4.14	462.17	5.81	460.50	4.17	462.14	6.70	459.61	3.52						
155	09/30/09	991943.98	728065.97	463.44	466.27	7.20	459.07	6.36	459.91	6.76	459.51	5.34	460.93	3.12	463.15	4.14	462.13	2.30	463.97	2.46	463.81	3.42	462.85	5.59	460.68	3.83	462.44	6.93	459.34	4.90						
156	11/09/09	991964.30	728791.30	464.89	467.60	8.30	459.30	7.75	459.85	8.03	459.57	7.00	460.60	4.55	463.05	5.48	462.12	3.88	463.72	4.07	463.53	4.88	462.72	6.91	460.69	5.20	462.40	8.16	459.44	4.42						
158	11/13/09	991945.43	729368.05	464.72	467.63	8.13	459.50	7.76	459.87	8.04	459.59	7.27	460.36	4.74	462.89	5.57	462.06	4.12	463.51	4.27	463.36	5.06	462.57	6.98	460.65	5.30	462.33	8.16	459.47	4.04						
160	12/11/09	991884.45	729979.25	463.70	466.42	6.67	459.75	6.33	460.09	6.78	459.64	6.30	460.12	3.68	462.74	4.35	462.07	NM ²	NM ²	3.31	463.11	3.90	462.52	5.77	460.65	4.02	462.40	6.82	459.60	3.51						
162	12/10/09	991801.20	730561.78	463.28	465.98	6.00	459.98	5.79	460.19	6.72 ³	459.26	6.00	459.98	3.48	462.50	4.00	461.98	2.91	463.07	3.15	462.83	3.67	462.31	5.73	460.25	3.73	462.25	6.30	459.68	3.39						
164	12/04/09	991871.12	731169.33	463.42	465.83	5.80	460.03	5.63	460.20	6.13	459.70	5.62	460.21	3.50	462.33	3.97	461.86	2.97	462.86	3.17	462.66	3.67	462.16	5.33	460.50	3.73	462.10	6.16	459.67	3.19						
165	11/13/09	991660.67	727734.64	464.05	466.80	7.73	459.07	6.74	460.06	7.14	459.66	5.49	461.31	3.36	463.44	4.42	462.38	2.47	464.33	2.76	464.04	3.66	463.14	5.90	460.90	4.14	462.66	7.30	459.50	5.26						
167	10/05/09	991646.82	728350.01	463.60	466.56	7.23	459.33	6.48	460.08	6.92	459.64	5.77	460.79	3.48	463.08	4.40	462.16	2.74	463.82	2.93	463.63	3.77	462.79	5.82	460.74	4.11	462.45	7.13	459.43	4.49						
169	12/02/09	991653.97	729053.82	464.75	467.42	7.92	459.50	7.36	460.06	7.13 ³	460.29	6.93	460.49	4.46	462.96	5.28	462.14	3.80	463.62	3.97	463.45	4.76	462.66	6.69	460.73	5.00	462.42	7.92	459.50	4.12						
171	12/02/09	991629.80	729636.72	463.97	466.87	7.09	459.78	6.72	460.15	7.15	459.72	6.63	460.24	4.10	462.77	4.80	462.07	3.49	463.38	3.62	463.25	4.36	462.51	6.17	460.70	4.50	462.37	7.30	459.57	3.81						
173	12/12/09	991592.90	730278.01	463.40	466.33	6.35	459.98	6.01	460.32	6.59	459.74	6.31	460.02	3.71	462.62	4.30	462.03	3.18	463.15	3.41	462.92	3.94	462.39	5.71	460.62	4.02	462.31	6.66	459.67	3.48						
175	12/15/09	991556.51	730873.59	463.57	466.06	5.98	460.08	5.79	460.27	6.32	459.74	6.13	459.93	3.64	462.42	4.12	461.94	3.08	462.98	3.32	462.74	3.83	462.23	5.49	460.57	3.97	462.09	6.36	459.70	3.28						
177	11/13/09	991336.76	728049.81	464.07	466.87	7.47	459.40	6.59	460.28	7.04	459.83	5.74	461.13	3.53	463.34	4.47	462.40	2.77	464.10	2.95	463.92	3.83	463.04	5.91	460.96	4.19	462.68	7.27	459.60	4.70						
179	12/03/09	991350.86	728780.92	464.19	466.93	7.37	459.56	6.69	460.24	7.14	459.79	6.24	460.69	3.89	463.04	4.74	462.19	3.24	463.69	3.43	463.50	4.17	462.76	6.13	460.80	4.45	462.48	7.39	459.54	4.15						
181	12/03/09	991334.49	729380.23	464.42	467.35	7.61	459.74	7.09	460.26	7.52	459.83	6.87	460.48	4.44	462.91	5.18	462.17	3.80	463.55	4.03	463.32	4.71	462.64	6.56	460.79	4.89	462.46	7.73	459.62	3.93						
183	12/11/09	991309.56	729980.89	463.40	465.96	5.86	460.10	5.44	460.52	6.15	459.81	5.76	460.20	3.28	462.68	3.92	462.04	2.81	463.15	2.98	462.98	3.49	462.47	5.19	460.77	3.52	462.44	6.22	459.74	3.41						
185	12/15/09	991289.70	730564.03	463.75	466.26	6.17	460.09	5.83	460.43	6.46	459.80	6.25	460.01	3.77	462.49	4.26	462.00	3.18	463.08	3.47	462.79	3.95	462.31	5.65	460.61	3.98	462.28	6.54	459.72	3.36						
187	10/28/09	991308.51	731386.11	462.85	465.67	5.46	460.21	5.30	460.37	5.91	459.76	5.83	459.84	3.43	462.24	3.81	461.86	2.85	462.82	3.15	462.52	3.58	462.09	5.13	460.54	3.56	462.11	5.91	459.76	3.06						
189	10/12/09	991059.00	728325.94	464.91	467.93	8.37	459.56	7.57	460.36	8.11	459.82	7.02	460.91	4.77	463.16	5.66	462.27	4.07	463.86	4.32	463.61	5.07	462.86	7.05	460.88	5.36	462.57	8.35	459.58	4.30						
191	12/03/09	991032.57	729099.94	464.41	467.10	7.37	459.73	6.71	460.39	7.25	459.85	6.45	460																							



June 14, 2012

Franklin County, Missouri
c/o Franklin County Planning & Zoning Department
Attention: Mrs. Scottie C. Eagan, Senior Planner
400 E. Locust Street
Room 003B
Union, MO 63084

RECEIVED

JUN 20 2012

FRANKLIN COUNTY MO
PLANNING & ZONING DEPT.

Dear Mrs. Eagan:

Please find attached a completed Initial Utility Waste Landfill Application on behalf of Union Electric Company, d/b/a Ameren Missouri ("Ameren Missouri"). We are also enclosing the required \$50,000.00 application fee. The Application includes design drawings described as Attachment "B".

The proposed Utility Waste Landfill described in the application (UWL) has been designed in accordance with the applicable ordinances of Franklin County, as well as applicable federal and state requirements. Ameren Missouri's engineers and consultants have been in consultation with the Independent Registered Professional Engineer (IRPE) (Andrews Engineering) appointed by Franklin County under Section 238 of the County's Unified Land Use Regulations during the design of this UWL. The IRPE has provided an initial review and approval of the current design.

Please acknowledge receipt of this application and upon favorable review, please provide a letter certifying approval under the County's Unified Land Use Regulations and all applicable County ordinances, permits or licenses, including specifically and without limitation, Section 238 thereof and County Commission Order 2011-307. This letter will be provided to the Missouri Department of Natural Resources (MDNR) as part of our Construction Permit Application. In accordance with Missouri Solid Waste Management Law and Rules, we are planning to submit the UWL design and all pertinent documentation to the MDNR for their further review as soon as practical. If you should have any questions regarding this application, please feel free to contact me at 314-554-2249.

Yours very truly,
Union Electric Company d/b/a Ameren Missouri

Barbara S. Skitt
Managing Supervisor
Real Estate Department

BSS/rst
Enclosures

120-115

Franklin County, Missouri
c/o Franklin County Planning & Zoning Department
Attention: Mrs. Scottie C. Eagan, Senior Planner
June 14, 2012
Page 2

bcc: Mr. Paul Reitz
Reitz & Jens, Inc.
1055 Corporate Square Drive
St. Louis, MO 63132-2928

Mr. Tom Gredell
Gredell Engineering
1505 E. High Street
Jefferson City, MO 65101

C. D. Naslund (07)
D. W. Weisenborn (1100)
M. L. Menne (602)
R. R. Meiners (Power Operations Services)
G. D. Douglass (700)
T. L. Hollenkamp (Power Operations Services)
D. L. Strubberg (LBD-645)
C. J. Giesmann (Power Operations Services)
S. B. Knowles (1310)
K. J. Gerhardt (Power Operations Services)
P. R. Pike (602)

120115

RECEIVED

JUN 20 2012

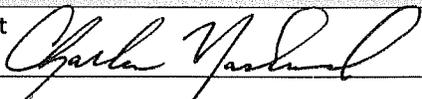
**Franklin County Planning and Zoning Department
Initial Utility Waste Landfill Application**

FRANKLIN COUNTY MO
PLANNING & ZONING DEPT

\$50,000.00 Fee:

Section A: Applicant Information		
Applicant Name	Ameren Missouri - Labadie Energy Center	Contact Person Mr. Craig J. Giesmann, P.E., P.M.P.
Mailing Address 3700 S. Lindbergh Blvd.		
City, State, Zip +4 St. Louis, MO 63127		
Phone	314-957-3407	Fax 314-957-3407
		Email cgiesmann@ameren.com
Section B: Property Location and Description		
Township	44 North	Range 2 East
		Section 17 & 20
Tax/Parcel ID Number (16 Digits) See Attachment "A"		
Development Site Address 226 Labadie Power Plant Road, Labadie, MO 63055		
Zoning District	Agricultural	Political Township Boles
		Total Acres See Attachment "B"
Subdivision Name See Attachment "A"		

- I hereby warrant and represent that I have the authority to execute this application on behalf of Union Electric Co., d/b/a Ameren Missouri and that I have the authority to make the representatives set forth herein.
- I hereby certify that this utility waste landfill will be in compliance with all federal, state and local laws and regulations
- I hereby certify that prior to any construction being commenced that all plans must be approved by the Independent Registered Professional Engineer retained by the County in accordance with the landfill regulations.
- I hereby certify this proposed utility waste landfill is contiguous to the boundary of the property upon which a public utility power generation plant is situated and under common ownership
- I hereby certify the only waste being disposed in the landfill is the waste that is generated by the plant situated in Franklin County which is located on property which is contiguous to the site
- I hereby certify this utility waste landfill shall be constructed in cells and only those cells which are already in use as of the date new regulations are adopted shall be considered to be "grandfathered"
- I hereby certify this utility waste landfill will have a leachate collection system designed and constructed similar in the manner as required by MoDNR
- I hereby certify this utility waste landfill will have ground water monitoring system capable of monitoring the ground water quality around the entire perimeter of the proposed landfill.
- I hereby certify this utility waste landfill will have at least a twenty five (25) foot buffer of natural vegetation from any property line not under common ownership
- I hereby certify that if any waste is removed from the site, it will be removed in sealed, container trucks
- I hereby understand if the County Environmental Resource Officer finds any violations with the utility waste landfill I will be notified of such violation.
- I hereby understand if I fail to rectify such violation, it is possible to be fined \$1,000.00 per day for each and every day the violation is not rectified.
- I hereby understand any penalty not paid within ninety (90) days after it is assessed shall result in the operating license for the utility waste landfill being revoked.

Signature of Applicant X 	Date 6/11/12
---	-----------------

For Office Use Only:	Paid Date:	Check #:	Fee:	Cash:
----------------------	------------	----------	------	-------

FILE NUMBER: 120115

ATTACHMENT "A"

Section B – Parcel ID Numbers & Subdivision

08-4-17.0-0-002-004.000	Miles P. Hinkle Estate Subdivision
08-4.17.0-0-000-003.000	Miles P. Hinkle Estate Subdivision
08-7-17.0-0-000.002.000	Worthington Heirs Subdivision
08-4-17.0-0-001.001.000	Worthington Heirs Subdivision

120115

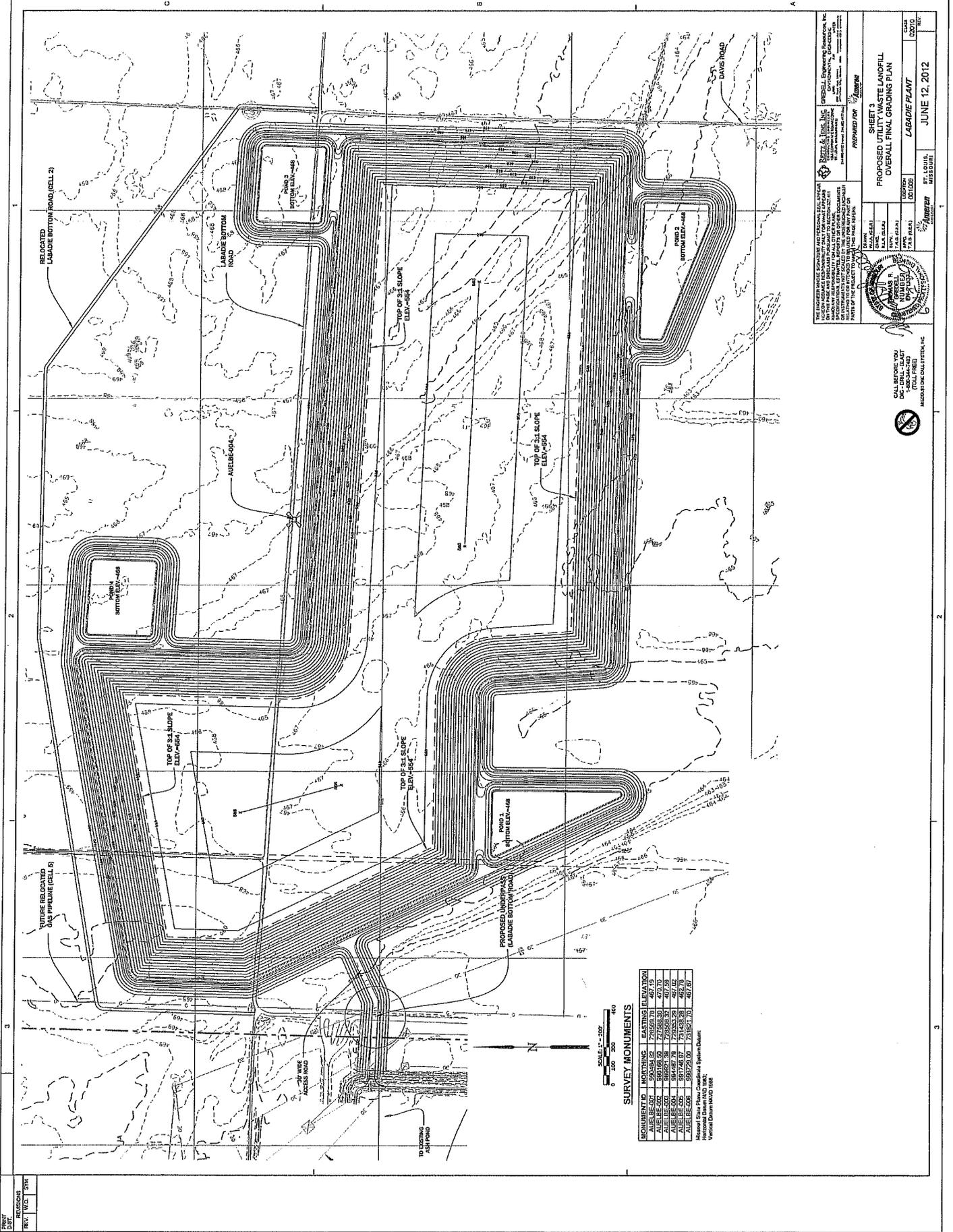
ATTACHMENT "B"

Labadie Power Plant Proposed Utility Waste Landfill

Sheet 1 – Cover Sheet

Sheet 2 – Existing Site Conditions

Sheet 3 – Overall Final Grade Plan



SHEET NO. 3
 DATE: 06/12/12

SURVEY MONUMENTS

MONUMENT ID	NORTHING	EASTING	ELEVATION
ALB1 (E)-501	85405.05	72552.73	467.39
ALB1 (E)-502	85405.05	72552.73	467.39
ALB1 (E)-503	85405.05	72552.73	467.39
ALB1 (E)-504	85405.05	72552.73	467.39
ALB1 (E)-505	85405.05	72552.73	467.39
ALB1 (E)-506	85405.05	72552.73	467.39
ALB1 (E)-507	85405.05	72552.73	467.39
ALB1 (E)-508	85405.05	72552.73	467.39
ALB1 (E)-509	85405.05	72552.73	467.39
ALB1 (E)-510	85405.05	72552.73	467.39

Missouri State Plane Coordinate System Datum:
 North American Datum 1983
 Vertical Datum: MVD 1985

THE ENGINEER HAS EXAMINED THE PLANS AND SPECIFICATIONS AND HAS FOUND THEM TO BE IN ACCORDANCE WITH THE REQUIREMENTS OF THE MISSOURI DEPARTMENT OF TRANSPORTATION AND THE MISSOURI DEPARTMENT OF REVENUE. THE ENGINEER'S EXAMINATION IS LIMITED TO THE TECHNICAL ASPECTS OF THE PLANS AND SPECIFICATIONS AND DOES NOT CONSTITUTE A GUARANTEE OF THE ACCURACY OF THE INFORMATION PROVIDED HEREON. THE ENGINEER'S LIABILITY IS LIMITED TO THE PROFESSIONAL SERVICES PROVIDED HEREON.

PREPARED FOR: **LABADIE**
 PROJECT: **LABADIE WASTE LANDFILL**
 SHEET NO.: **3**
 DATE: **JUNE 12, 2012**

ENGINEER: **DAVID R. LABADIE**
 LICENSE NO.: **00010**
 LOCATION: **ST. LOUIS, MISSOURI**

CALL BEFORE YOU DIG
 800-488-4888
 MISSOURI ONE CALL SYSTEM, INC.



August 22, 2013

**CERTIFIED MAIL
RETURN RECEIPT REQUESTED**

Franklin County Missouri Planning & Zoning Department
Attention: Mrs. Scottie C. Eagan, Senior Planner
400 E. Locust Street
Room 003B
Union, MO 63084

Dear Mrs. Eagan:

Please find enclosed a completed Utility Waste Landfill Renewal Application on behalf of Union Electric Company d/b/a Ameren Missouri ("Ameren Missouri"). We are also enclosing the required \$50,000.00 application fee.

The proposed utility Waste Landfill described in the application (UWL) has been designed in accordance with the applicable ordinances of Franklin County, as well as applicable federal and state requirements.

Please acknowledge receipt of this application and upon favorable review, please provide a letter certifying approval under the county's Unified Land Use Regulations and all applicable County ordinances, permits or licenses, including specifically and without limitation, Section 238 thereof and County Commission Order 2011-307. This letter will be provided to the Missouri Department of Natural Resources (MDNR) as part of our Construction Permit Application. In accordance with Missouri Solid Waste Management Law and Rules, we are planning to submit the UWL design and all pertinent documentation to the MDNR for their further review as soon as practical. If you should have any questions regarding this application, please feel free to contact me at 314-554-2249.

Yours very truly,

Barbara S. Skitt
Real Estate Managing Supervisor

✓SMS/mdk
Enclsoures

FRANKLIN COUNTY

PLANNING & ZONING DEPARTMENT
PUBLIC WORKS DIVISION



400 EAST LOCUST STREET
ROOM 003B
UNION, MO 63084
MAIN LINE (636) 583-6369
FAX (636) 583-7911
www.franklinmo.org

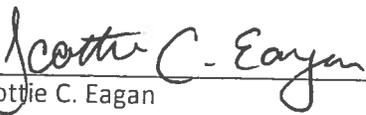
July 19, 2013

Ameren Missouri
c/o Craig J Giesmann, P.E., P.M.P.
3700 South Lindbergh Blvd
St. Louis, MO 63127

RE: Utility Waste Landfill
Renewal Application 2013

Date	Service Provided	Amount	Rate	Total
07/19/13	Utility Waste Landfill Renewal Fee	1	\$50,000.00/renewal	\$50,000.00
			TOTAL DUE:	<u>\$50,000.00</u>

Your prompt payment is appreciated. Thank you.

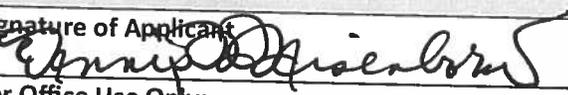


Scottie C. Eagan
Planning Director

Franklin County Planning and Zoning Department

Initial Utility Waste Landfill Application

\$50,000.00 Fee:

Section A: Applicant Information			
Applicant Name Ameren Missouri - Labadie Energy Center		Contact Person Mr. Craig J. Giesmann, P.E., P.M.P.	
Mailing Address 3700 S. Lindbergh Blvd.			
City, State, Zip +4 St. Louis, MO 63127			
Phone 314-957-3407	Fax 314-957-3407	Email cgiesmann@ameren.com	
Section B: Property Location and Description			
Township 44 North	Range 2 East	Section 17 & 20	
Tax/Parcel ID Number (16 Digits) See Attachment "A"			
Development Site Address 226 Labadie Power Plant Road, Labadie, MO 63055			
Zoning District Agricultural	Political Township Boles	Total Acres See Attachment "B"	
Subdivision Name See Attachment "A"			
<ul style="list-style-type: none"> • I hereby warrant and represent that I have the authority to execute this application on behalf of <u>Union Electric Co., d/b/a Ameren Missouri</u> and that I have the authority to make the representatives set forth herein. • I hereby certify that this utility waste landfill will be in compliance with all federal, state and local laws and regulations • I hereby certify that prior to any construction being commenced that all plans must be approved by the Independent Registered Professional Engineer retained by the County in accordance with the landfill regulations. • I hereby certify this proposed utility waste landfill is contiguous to the boundary of the property upon which a public utility power generation plant is situated and under common ownership • I hereby certify the only waste being disposed in the landfill is the waste that is generated by the plant situated in Franklin County which is located on property which is contiguous to the site • I hereby certify this utility waste landfill shall be constructed in cells and only those cells which are already in use as of the date new regulations are adopted shall be considered to be "grandfathered" • I hereby certify this utility waste landfill will have a leachate collection system designed and constructed similar in the manner as required by MoDNR • I hereby certify this utility waste landfill will have ground water monitoring system capable of monitoring the ground water quality around the entire perimeter of the proposed landfill. • I hereby certify this utility waste landfill will have at least a twenty five (25) foot buffer of natural vegetation from any property line not under common ownership • I hereby certify that if any waste is removed from the site, it will be removed in sealed, container trucks • I hereby understand if the County Environmental Resource Officer finds any violations with the utility waste landfill I will be notified of such violation. • I hereby understand if I fail to rectify such violation, it is possible to be fined \$1,000.00 per day for each and every day the violation is not rectified. • I hereby understand any penalty not paid within ninety (90) days after it is assessed shall result in the operating license for the utility waste landfill being revoked. 			
Signature of Applicant X 		Date 8/26/2013	
For Office Use Only:			
Paid Date:	Check #:	Fee:	Cash:

FILE NUMBER:



P.O. Box 66892 St. Louis, Missouri 63166

US BANK
Miamisburg, OH

56-503
422

AMERICAN MISSOURI
CHECK NUMBER **1397682**

DATE
08/19/13

AMOUNT
\$50,000.00

PAY *Fifty Thousand Dollars And Zero Cents***

PAY TO THE ORDER OF
FRANKLIN COUNTY MISSOURI
PLANNING & ZONING
ROOM 003B
400 EAST LOCUST
UNION, MO 63084
THIS CHECK VOID AFTER 180 DAYS

AUTHORIZED SIGNATURE

⑈ 1397682 ⑈ ⑆042205038⑆ 130103013681⑈

THE ORIGINAL DOCUMENT HAS A SPECIAL DESIGNED REFLECTIVE SECURITY WATERMARK ON THE BACK. HOLD AT AN ANGLE TO VIEW WHEN CHECKING ENDORSEMENT.

INVOICE NUMBER	DATE	DESCRIPTION	GROSS AMOUNT	DISCOUNT	NET AMOUNT
DR001933274	08/15/13	-18794- .UTILITY WASTE LANDFILL RENW AP	50,000.00	0.00	50,000.00
CHECK NUMBER 1397682	DATE 08/19/13	VENDOR NAME FRANKLIN COUNTY MISSOURI	VENDOR NUM 61929		TOTAL AMOUNT 50,000.00



178084

Acceptance and Endorsement of attached check will acknowledge payment in full of Amount as stated *

Joe Feldmann

From: Mark Vincent <marksvincent13@gmail.com>
Sent: Tuesday, August 27, 2013 7:40 AM
To: Joe Feldmann
Cc: John E. Griesheimer; Tim Brinker; Lt. Mike Schatz; Tammy Vemmer
Subject: AMEREN

AMEREN is required to pay \$50,000.00 annually with regard to its license. Please check with your contacts to see when they plan on paying this. Thanks.

Article 10: Supplementary Use Regulations

Section 226: Permissible Uses and Specific Exclusions

- A. The presumption established by these regulations is that all legitimate uses of land are permissible within at least one zoning district in the unincorporated county. Therefore, because the list of permissible uses set forth in Article 7 cannot be all inclusive, those uses that are listed shall be interpreted liberally to include other uses that have similar impacts to the listed uses.
- B. Notwithstanding Subsection (a), all uses that are not listed in Article 7, even given the liberal interpretation mandated by Subsection (a), are prohibited. Nor shall Article 7 be interpreted to allow a use in one zoning district when the use in question is more closely related to another specified use that is permissible in other zoning districts.
- C. Without limiting the generality of the foregoing provisions, the following uses are specifically prohibited in all districts:
 - 1. Any use that involves the manufacture, handling, sale, distribution, or storage of any highly combustible or explosive materials in violation of the county's fire prevention code.
 - 2. Use of a travel trailer or tent for other than recreational purposes or in an area not designated as a campground, with the following exceptions:
 - a. In an Agricultural Non-Urban zoning district (ANU) a travel trailer or tent may be occupied for up to a total of 90 days in a one-year period.
 - b. In any other zoning district, a travel trailer or tent may be occupied for up to a total of 14 days in a one-year period.
 - 3. Use of a motor vehicle parked on a lot as a structure in which, out of which, or from which any goods are sold or stored, any services are performed, or other business is conducted, except use of mobile health vehicles and bookmobiles.
 - 4. Use of a manufactured house (mobile home) for any purpose other than a residence or office.

Section 227: Accessory Uses

- A. Article 7 classifies different principal uses according to their different impacts. Whenever an activity (which may or may not be separately listed as a principal use in this table) is conducted in conjunction with another principal use and the former use (i) constitutes only an incidental or insubstantial part of the total activity that takes place on a lot, or (ii) is commonly associated with the principal use and integrally related to it, then the former use may be regarded as accessory to the principal use and may be carried on underneath the umbrella of the permit issued for the principal use.

Adopted on December 14th, 2000

Effective on January 1st, 2001

10.1

Revised 9/29/05; 5/10/07; 3/1/10; 9/20/11; 10/25/11; 04/24/2012

B. For purposes of interpreting Subsection (a):

1. A use may be regarded as incidental or insubstantial if it is incidental or insubstantial in and of itself or in relation to the principal use,
2. To be commonly associated with a principal use it is not necessary for an accessory use to be connected with such principal use more times than not, but only that the association of such accessory use with such principal use takes place with sufficient frequency that there is common acceptance of their relatedness.

C. Without limiting the generality of Subsections (a) and (b), the following activities, so long as they satisfy the general criteria set forth above, are specifically regarded as accessory to residential principal uses:

1. Offices or studios within an enclosed building and used by an occupant of a residence located on the same lot as such building to carry on administrative or artistic activities of a commercial nature, so long as such activities do not fall within the definition of a home occupation.
2. Hobbies or recreational activities of a noncommercial nature.
3. The renting out of one or two rooms within a single family residence (which one or two rooms do not themselves constitute a separate dwelling unit) to not more than two persons who are not part of the family that resides in the single family dwelling.
4. Yard sales or garage sales, so long as such sales are not conducted on the same lot for more than three days (whether consecutive or not) during any 90-day period.

D. Without limiting the generality of Subsections (a) and (b), storage outside of a substantially enclosed structure of more than 2 motor vehicles that are neither licensed nor operational shall not be regarded as accessory to a residential principal use and are prohibited in residential districts.

Section 228: Permissible Uses Not Requiring Permits

Notwithstanding any other provisions of these regulations, no zoning or conditional use permit is necessary for the following uses:

- A. Streets (does not include proposed streets in subdivisions).
- B. Electric power, telephone, telegraph, cable television, gas, water, and sewer lines, wires or pipes, together with supporting poles or structures, located within a public right-of-way.
- C. Neighborhood utility facilities located within a public right-of-way with the permission of the owner (state or county) of the right-of-way.

Section 229: Change in Use

- A. A substantial change in use of property occurs whenever the essential character or nature of the activity

Adopted on December 14th, 2000

Effective on January 1st, 2001

10.2

Revised 9/29/05; 5/10/07; 3/1/10; 9/20/11; 10/25/11; 04/24/2012

conducted on a lot changes. This occurs whenever the change involves a change from one principal use category to another.

- B. A mere change in the status of property from unoccupied to occupied or vice versa does not constitute a change in use. Whether a change in use occurs shall be determined by comparing the two active uses of the property without regard to any intervening period during which the property may have been unoccupied, unless the property has remained unoccupied for more than 365 consecutive days or has been abandoned (see Article 6 Non-conforming uses).
- C. A mere change in ownership of a business or enterprise or a change in the name shall not be regarded as a change in use.

Section 230: Combination Uses

- A. When a combination use comprises two or more principal uses that require different types of permits (zoning or conditional use), then the permit authorizing the combination use shall be:
 - 1. A conditional use permit if any of the principal uses combined requires a conditional use permit.
 - 2. A zoning permit in all other cases.
- B. When a combination use consists of a single family detached residential subdivision and two-family or multi-family uses, the total density permissible on the entire tract shall be determined by having the developer indicate on the plans the portion of the total lot that will be developed for each purpose and calculating the density for each portion as if it were a separate lot.

Section 231: Exemptions from Zoning Provisions

- A. These regulations shall not be exercised to impose regulations, or to require permits, with respect to land used, or to be used, for the raising of crops, horses, livestock, poultry, orchards, or forestry; or with respect to the erection, maintenance, repair, alteration, or extension of buildings or structures used, or to be used, exclusively for agricultural purposes as described herein. However, this section shall not exempt such structures that shall be located in designated flood areas. Said structures shall be required to comply with all county, state, and federal floodplain regulations in regard to construction permits.
- B. These regulations shall not restrict the right of governmental or municipal agencies or emergency services (such as fire departments or districts, ambulance districts, and police agencies) to locate and establish such facilities as are considered essential for the provision of adequate emergency services to the public.
- C. The Unified Land Use Regulations shall not apply with respect to the placement and operation of temporary asphalt, concrete or rock crushing plants or any other operation which the County Commission deems essential in support of any state, county or municipal highway or bridge contract or project. In order to obtain a permit under this section, the following requirements must be met:

Adopted on December 14th, 2000

Effective on January 1st, 2001

10.3

Revised 9/29/05; 5/10/07; 3/1/10; 9/20/11; 10/25/11; 04/24/2012

1. A written request must be submitted to the Franklin County Planning & Zoning Director on forms provided by the Planning & Zoning Department for such purpose.
2. The application must be accompanied by fully executed and final contract or contracts issued by the state, county, or a municipality within Franklin County.
3. The application must state specifically where the plant or facility will be located to include a site plan of the proposed temporary facility and a locator map showing the exact location of the proposed facility, the hours of operation, the length of time for which the permit is desired, a list of the projects to be supported by the facility with construction limits pertaining thereto and a locator map reflecting the sites of the project or projects to be supported.
4. A permit fee of \$400.00 which is the sum necessary to review the application, investigate the proposed site and monitor compliance.

Once an application is received, it will be reviewed by the Planning & Zoning Director for completeness. After verifying and confirming that the application is complete, the Planning & Zoning Director shall forward the application to the Franklin County Commission, the Franklin County Highway Administrator and any other agency or department which the Planning & Zoning Director or the County Commission deems appropriate. Such review will consider at a minimum the benefit or detriment to taxpayers of having a temporary plant or facility available for a given project. Each department or agency tasked to review any such application shall review same and shall forward findings in an expeditious manner to the County Commission.

If the County Commission determines that it is in the best interest of the taxpayers to allow a temporary facility, a permit will be issued by the County Commission. The County Commission shall attach such conditions to the permit as it deems appropriate. In addition to such special conditions, all permits so issued shall be subject to the following:

1. The temporary use shall not exceed one (1) year.
2. The use of any material manufactured or processed at the temporary facility for any purpose or in support of any project other than the governmental projects which accompanied the application will result in the automatic and immediate revocation of the permit.
3. No construction debris to include clean Afill@ shall be placed on the site unless specifically permitted as part of the approval.
4. Laying of Atest strips@ on private property shall be permitted but only if the material used to perform the test strips is provided to the owner of the private property for no consideration, either directly or indirectly or monetary or in kind.
5. If a publicly maintained county road is involved, in addition to the normal review and the recommendations by the County Highway Administrator, the County Highway Administrator shall also determine whether or not a cash bond or similar security is required in order to

Adopted on December 14th, 2000

Effective on January 1st, 2001

10.4

Revised 9/29/05; 5/10/07; 3/1/10; 9/20/11; 10/25/11; 04/24/2012

insure that there is a source of funding available to repair any damage caused by the operation of the temporary facility.

6. Prior to operation of any temporary facility, the Planning & Zoning Director or his designated representative shall conduct an inspection of the proposed site in order to note the condition of any public road which shall be used in conjunction with the facility in addition noting other conditions which are specific to such site.
7. Upon completion of the project or projects being supported, the Planning & Zoning Director or his designated representative shall conduct an inspection of the facility site in order to determine any damage to public property caused by the operation of the facility and to verify that no other condition was violated.
8. In the event an applicant desires to amend or extend the operation of the facility, the applicant must submit a request therefore in writing to the Planning & Zoning Director. Such written request shall include the specific reasons why an extension or modification is needed. A review of such request shall be made in the same manner as the original application. Any request or amendment must be accompanied by an additional processing fee of \$250.00.

Section 232: Temporary Emergency, Construction, or Repair Residences

- A. Temporary residences used on construction sites of nonresidential premises shall be removed immediately upon the completion of the project.
- B. A manufactured house (mobile home) may be placed and occupied as a residence temporarily upon a lot with at least three (3) acres on which there is an existing site built home, constructed in accordance with the standards set forth in the Franklin County building code and occupied by the property owner. The temporary residence shall be occupied by a member of the immediate family and separated from such other home or other buildings by at least 25 feet. Evidence, as required by the Planning and Zoning Department, shall be required every two (2) years to show that a medical hardship exists. Such evidence shall be utilized to determine the justification or need for placing a second residence in accordance with this section. When the medical hardship ceases to exist, the applicant shall remove the temporary residence within sixty (60) days. A permit for a temporary residence shall remain valid so long as the medical hardship exists to warrant the temporary residence.
- C. Permits for temporary residences to be occupied pending the construction, repair, or renovation of the permanent residential building on a site shall expire twelve months after the date of issuance, except that the Administrator may renew such permit for an additional period not to exceed six (6) months if he determines that such renewal is reasonably necessary to allow the proposed occupants of the permanent residential building to complete the construction, repair, renovation, or restoration work necessary to make such building habitable (this period of time corresponds with the issuance of a valid building permit).

Adopted on December 14th, 2000

Effective on January 1st, 2001

10.5

Revised 9/29/05; 5/10/07; 3/1/10; 9/20/11; 10/25/11; 04/24/2012

Section 233: Minimum Lot Widths

A. No lot, except common ground or utility lot, may be created that is so narrow or otherwise so irregularly shaped that it would be impracticable to construct on it a building that:

1. Could be used for any purposes that are permissible in that zoning district, and
2. Could satisfy any applicable setback requirements for the district.

B. Without limiting the generality of the foregoing standard, the following table indicates minimum lot widths that are recommended and are deemed presumptively to satisfy the standard set forth in Subsection (a). The lot width shall be measured along a straight line connecting the points at which a line that demarcates the required setback from the street intersects with lot boundary lines at opposite sides of the lot.

Zone	Lot Width (in feet)
SD	100
RD	100
RD-1	75
RD-2	75
CD	75
CA	75
CA-3	100
ID	100
AN	150

C. No lot created after the effective date of these regulations that is less than the recommended width shall be entitled to a variance from any building setback requirement.

Section 234: Building Setback Requirements

A. Subject to other provisions of this section, no portion of any building or any freestanding structure may be located on any lot closer to any lot line or the street right-of-way line than is authorized in table #8-2 and Section 193 (B) found in Article 8.

1. If the street right-of-way line is readily determinable (by reference to a recorded plat, survey corner markers, or other means), the setback shall be measured from such right-of-way line.
2. As used in this section, the term lot boundary line refers to lot boundaries other than those that abut streets.

Adopted on December 14th, 2000
 Effective on January 1st, 2001
 Revised 9/29/05; 5/10/07; 3/1/10; 9/20/11; 10/25/11; 04/24/2012

3. As used in this section, the term building includes any substantial structure which by nature of its size, scale, dimensions, bulk, or use tends to constitute a visual obstruction or generate activity similar to that usually associated with a building. Without limiting the generality of the foregoing, the following structures shall be deemed to fall within this description:
 - a. Gas pumps and overhead canopies and roofs.
 - b. Fences along lot boundaries adjacent to public street rights-of-way if such fences exceed six feet in height or are substantially opaque.
 4. Notwithstanding any other provision of these regulations, a sign may be erected on or affixed to a structure that (i) has a principal function that is something other than the support of the sign (e.g., a fence), but (ii) does not constitute a building as defined in these regulations, only if such sign is located so as to comply with the setback requirement applicable to freestanding signs in the district where such sign is located.
- B. Any on-premise signs thirty two (32) square feet or greater shall have a front setback of twenty (20) feet. Any on-premise signs less than thirty two (32) square feet shall be exempt from front setbacks as long as they are not encroaching on the right-of-way.
 - C. Setback distances shall be measured from the property line or street right-of-way line to a point on the lot that is directly below the nearest extension of any part of the building that is substantially a part of the building itself and not a mere appendage to it (such as a flagpole, etc.).
 - D. Where the building setback lines have been established along a private, state and county roads, the Planning Director may, at his discretion, determine the proper setback line for new construction consistent with the previously established line.

Section 235: Waste Control Definitions and Regulations

A. Definitions:

1. Recycling Collection – A facility, including but not limited to bulk or single-feed reverse vending machines, used for the collection and transfer, but not the actual processing, of any of the following recyclable materials: glass, paper, plastic, cans, or other source-separated, nonputrescible materials. For purposes of this use, “recyclable materials” shall not include motor oil, chemicals, household appliances, tires, automobiles, automobile parts putrescible materials or hazardous waste materials. Such facilities may be allowed in Commercial Activity (CA) and Commercial Activity 3 (CA3) Districts with a conditional use permit.
2. Recycling Center – An establishment engaged in the processing, collection and transfer, but not storage, of recyclable materials. Typical recyclable materials include glass, paper, plastic, cans, or other source-separated, nonputrescible materials. Such facilities may be allowed in Industrial Development (ID) Districts with a conditional use permit.

Adopted on December 14th, 2000

Effective on January 1st, 2001

10.7

Revised 9/29/05; 5/10/07; 3/1/10; 9/20/11; 10/25/11; 04/24/2012

3. Composting facility, yard waste – A commercial facility where yard waste is accepted from the public for composting. Composting is an aerobic (oxygen-dependent) degradation process by which organic wastes decompose under controlled conditions. Yard waste shall be defined as leaves, grass clippings, yard and garden vegetation, Christmas trees, shrubs, vegetable and flower garden waste and brush which has been produced as a result of lawn and garden care maintenance. The parcel on which the composting facility is located shall not be less than 40 acres and may not be reduced while the facility is in operation. Compost material shall not be on an area greater than 100,000 square feet and shall not be allowed to accumulate higher than 10 feet from the bottom of the composed materials. The compost material shall be placed near the center of the property with setbacks of at least 400 feet from any property line (this setback may be modified depending on the particulars of the site). There shall be a storm water control basin on site that will control discharge of materials from the area. The site shall have access to a water system capable of sustaining fire suppression for the facility. This type of facility shall not be within 2500 feet from the following zoning districts: Residential Development (RD), Residential Development 2 (RD2), Suburban Development (SD), Community Development (CD). So long as the foregoing is complied with, such facilities may be allowed in Industrial Development (ID) and Agricultural Non-Urban (ANU) Districts with a conditional use permit.

4. Trash Transfer Facility – A site, which has a fully enclosed structure that accepts solids for temporary storage or consolidation and for transfer to a waste disposal, processing or storage facility. Any such facility shall not have any open storage of any solid or liquid waste products and must be kept clean at all times. Facilities of this type shall not permit storage of waste for a period greater than 24 hours and shall not create a public health or aesthetic nuisance. Overnight parking of loaded or partially loaded solid waste collection vehicles is strictly prohibited. On sight overnight parking of unloaded solid waste collection vehicles or vehicles used in the transfer of solid waste shall only be allowed on site when there is adequate fencing and screening by vegetation to secure and allow the site to be aesthetically compatible with the area. All fencing and buffering of such facilities must be based upon a plan approved in advance by the Planning & Zoning Department. Any such facility which allows such screening and fencing to deteriorate from what was originally approved by the Planning & Zoning Department may be closed down by the Planning & Zoning Department until such time as all deficiencies have been corrected. This type of facility shall only be allowed in areas where there is a central wastewater collection system. Storm water and water run off shall be maintained on site by the property owner so that any debris or liquids will not be discharged in any creek or stream without water quality issues being addressed. No transportation, separation and storage of hazardous waste will be allowed. This type of facility shall not be within 1000 feet from the following zoning districts: Residential Development (RD), Residential Development 2 (RD2), Suburban Development (SD), Community Development (CD), Agricultural Non-Urban (ANU). So long as the foregoing is complied with, such facilities may be allowed in Industrial Development (ID) Districts with a conditional use permit.

B. Periodic Inspections

All transfer, collection, recycling facilities, and composting facilities shall be subject to periodic,

Adopted on December 14th, 2000

Effective on January 1st, 2001

10.8

Revised 9/29/05; 5/10/07; 3/1/10; 9/20/11; 10/25/11; 04/24/2012

unannounced inspections by the County Health Department and/or such other agency designated by the County Commission and shall also be subject to an annual re-permitting inspection as described hereinafter. By applying for a permit to operate such a facility the applicant, or its successors and assigns, shall be deemed to have granted to such agencies the right at any time to enter onto such premises for the purposes of performing inspections. Any person or entity which possesses a conditional use permit for any facility which is governed by these regulations shall be required to reapply annually for renewal of such permit. The application for renewal shall be submitted on forms supplied by the Planning and Zoning Department and must be submitted along with the required inspection of the then existing permit. Failure to timely submit such renewal application and/or the required inspection deposit shall result in the existing permit to be rescinded. Any and all violations shall be subject to enforcement in accordance with the Franklin County Unified Land Use Regulations, all building codes adopted by Franklin County as well as to all applicable provisions of Missouri law. Each day wherein a condition which constitutes a violation is allowed to exist shall be a separate violation.

C. Access Requirements

All road and highway networks leading to and from any waste control facility governed by these regulations must be suitable to handle waste collection traffic. The County Highway Engineer must certify that the road network is suitable before any permit may be issued.

D. Deposit Schedule

Attached hereto and incorporated herein is the schedule of the required deposit for permit applications and permit renewal applications for the facilities governed by these regulations. Because each of the different types of facilities can vary in the degree of complexity the required deposits may be different. The appropriate agencies involved in the permitting process shall assess the cost of issuing and/or renewing a permit against such deposit. In the event the cost of issuance or renewal is less than the deposit a refund shall be made to the applicant. In the event the cost of issuance or renewal is more than the deposit the applicant shall be required to submit the difference. In no event shall any final action be taken on an application or renewal until any such cost differential has been paid.

Section 236: Home Occupation Regulations

Standards for the operation of a Home Occupation:

Only one (1) occupation or profession shall be permitted per residential unit.

No more than two (2) customers or clients may be served in a residence at one time, except in the case of photography studios or dance studios, where the number of customers shall not exceed ten (10).

- A. The occupational use may occupy no more than twenty-five (25) percent of the total floor area of the primary residential structure plus any additional buildings housing the home occupation, and in no case more than five hundred (500) square feet of total floor area.
- B. One (1) non-illuminated sign for home occupation indicating only the name of the person and the occupation shall be allowed, not to exceed two square feet.

Adopted on December 14th, 2000

Effective on January 1st, 2001

10.9

Revised 9/29/05; 5/10/07; 3/1/10; 9/20/11; 10/25/11; 04/24/2012

- C. No more than one person who is not a resident of the premises may be employed in connection with the home occupation.
- D. No offensive noise, vibration, smoke, dust, odors, heat, or glare shall be produced by the home occupation.
- E. No exterior storage of materials, products or other outdoor display shall be allowed.
- F. There shall be no additional or separate exterior entrance from outside the principal building to the home occupation, except that which serves the residential portion.
- G. No structure additions, enlargements, or exterior alterations are permitted that would change the residential character of the principal building.
- H. The home occupation shall not have more than one commercial vehicle, which must be stored in an enclosed garage. No heavy commercial equipment or vehicles may be parked in connection with a home occupation.
- I. Off street parking must be provided such that no traffic or safety hazards are created.
- J. Any use that is listed in Article 7 as a permitted or conditional use shall require a zoning permit or conditional use permit and may not be done in connection with a Home Occupation.
- K. Delivery of items to and from the home may be done by single axle trucks only (no tractor trailers).

Specific examples of Home Occupations permitted. These may include, but are not limited to the following:

- A. A professional such as an engineer/surveyor, planner, architect, attorney, or accountant
- B. Dressmaker, seamstress, or tailor
- C. Music, dancing, or other teachers, or tutors
- D. Beauty, barber, or manicure services having no more than two (2) operators who are principal occupants of the premises
- E. Real estate or insurance services
- F. Photography studio devoted to the photography of individuals or small groups
- G. Artists, composers, and authors
- H. Internet sales with off site delivery and shipments
- I. Other computer-related consulting or services with no on-site customers and no sales of goods

Specific examples of Home Occupations prohibited. Home occupations shall not, in any event, be deemed to include, but not limited to the following:

- A. Automobile, truck, or vehicle repair
- B. Rental business
- C. Stables or kennels
- D. Eating or drinking establishments
- E. Veterinarian services and animal hospitals
- F. Mortuaries and embalming establishments
- G. Private clubs, including fraternity and sorority houses
- H. Storage of construction materials or contractors' equipment
- I. Wholesale or retail distribution or sales (with the exception of internet sales as stated in #8 under permitted Home Occupations).

Adopted on December 14th, 2000

Effective on January 1st, 2001

10.10

Revised 9/29/05; 5/10/07; 3/1/10; 9/20/11; 10/25/11; 04/24/2012

Section 237: Cemeteries and Burial Grounds

- A. Cemeteries: Any currently existing cemeteries located on any parcel being developed shall be in compliance with the Missouri Revised Statutes, and
 - 1. Must be shown as a cemetery on the subdivision plat with the name of such cemetery.
 - 2. No easement or right of way shall be placed on the cemetery.
 - 3. Public access to the cemetery shall be shown on the plat from the closest subdivision street. Access should not be from a county road unless off street parking is provided by the developer.
 - 4. Cemetery should have a fence or other border that delineates the boundaries of the cemetery.
 - 5. Cemetery must have signage that identifies it as a cemetery.
 - 6. Cemetery shall be assigned an address.

- B. New Family Burial Ground: All new family burial grounds shall comply with Missouri Revised Statutes, and
 - 1. A legal description or spot survey shall be provided to the Planning and Zoning office and recorded with the Recorder of Deeds.
 - 2. Access to the family burial ground must be indicated on said survey or legal description.
 - 3. Cemetery should have a fence or other border that delineates the boundaries of the cemetery.
 - 4. Cemetery must have signage that identifies it as a cemetery.
 - 5. Cemetery shall be assigned an address.

- C. Public and Private Cemeteries (New): All public and private cemeteries (defined as those available for use by unrelated persons for a fee) shall comply with Missouri Revised Statutes, and
 - 1. Shall comply with all applicable Franklin County Land Use Regulations.
 - 2. Roadway leading to the cemetery must be a dedicated public right-of-way of at least fifty (50) feet in width.
 - 3. Driveways within cemetery shall be a minimum of twenty (20) feet in width on a minimum of a thirty (30) foot easement.
 - 4. Improvement plans shall be submitted.

Adopted on December 14th, 2000
Effective on January 1st, 2001
Revised 9/29/05; 5/10/07; 3/1/10; 9/20/11; 10/25/11; 04/24/2012

5. Subdivision plat shall be submitted for recording showing all lots, walks, and drives in the cemetery, all with descriptive names and numbers.
6. Cemetery shall be assigned an address.

Section 238: Landfill Uses

A. Definitions

1. *Bottom Ash.* The agglomerated, angular ash particles, formed in pulverized coal furnaces that are too large to be carried in the flue gases and collect on the furnace walls or fall through open grates to an ash hopper at the bottom of the furnace.
2. *Coal Combustion Products (CCPs).* Fly ash, bottom ash, broiler slag, or flue gas desulfurization materials, that are beneficially used.
3. *CCR (Coal Combustion Residuals) Landfill:* See *Utility Waste Landfill*.
4. *Coal Combustion Residuals (CCRs).* Fly ash, bottom ash, broiler slag, and flue gas desulfurization materials destined for disposal. CCRs are also known as coal combustion wastes (CCWs) and fossil fuel combustion (FFC) wastes, when destined for disposal.
5. *Composite Liner System.* The requirement that any Utility Waste Landfill be constructed with a system which has an upper component and a lower component. The design and construction standards for both components are set forth in the provision pertaining to “Construction Standards”.
6. *Construction Standards.* The technical requirements and methods by which Utility Waste Landfills must be constructed. Specific standards are as set forth in this Section 238. Such specific standards may be supplemented by EPA and/or MoDNR regulations. In the event of a conflict between the specific provisions contained in these regulations and any EPA or MoDNR regulations adopted by this reference, the more restrictive shall control.
7. *Environmental Resource Officer.* The employee of the Franklin County Commission who shall insure that the owner/operator of a Utility Waste Landfill is operating the Utility Waste Landfill in accordance with the requirements of this Section 238. The Environmental Resource Officer shall have the authority to enforce compliance with these regulations by levying penalties and/or by recommending to the license issuing authority that the license of the non-compliant entity be revoked.
8. *Fly ash.* The very fine globular particles of silica glass which is a product of burning finely ground coal in the broiler to produce electricity, and is removed from the plant exhaust gases by air emission control devices.
9. *Fugitive Dust Controls.* The controls established to minimize the impact of fugitive dust on the environment. In addition to the specific controls set forth in these regulations, the County hereby

Adopted on December 14th, 2000

Effective on January 1st, 2001

10.12

Revised 9/29/05; 5/10/07; 3/1/10; 9/20/11; 10/25/11; 04/24/2012

also adopts prospectively the provisions of any State Implementation Plan (SIP) which may hereafter be enacted and adopted by the Missouri Department of Natural Resources. In the event that a conflict were to arise between the provisions of these regulations and any SIP, the more restrictive shall control.

10. *Grandfathered.* A use which is in existence as of the date new regulations or amended regulations are adopted.
11. *Groundwater.* Water below the land surface in the zone of saturation.
12. *Groundwater Monitoring Systems.* The system by which samples of groundwater are collected from wells around the Utility Waste Landfill and are analyzed to determine whether or not the groundwater has been contaminated by leachate from the Utility Waste Landfill. All groundwater monitoring systems shall be designed and constructed in accordance with the provision in these regulations pertaining to “construction standards”. Groundwater shall be monitored in accordance with “operation and maintenance standards” as set forth in these regulations.
13. *Independent Registered Professional Engineer.* The individual selected by the Franklin County Commission to:
 - a. verify all designs of any type of landfill submitted for review in order to insure compliance with these regulations and regulations promulgated by MDNR,
 - b. to insure that construction is in accordance with the plans as submitted,
 - c. to test all required samples, and
 - d. to assist the Environmental Resource Officer with insuring that all landfills are being operated and maintained in accordance with these regulations as well as to perform such other duties as set forth in these regulations. If necessary, the Independent Registered Professional Engineer is authorized to subcontract with a Registered Professional Geologist licensed in Missouri. The owner/operator shall pay all fees and expenses charged by the Independent Registered Professional Engineer, whether for direct or subcontracted services. The Independent Registered Professional Engineer shall be licensed by the State of Missouri and must be experienced in the areas of landfill engineering, groundwater system design and monitoring groundwater samples analysis. In selecting the Independent Registered Professional Engineer, the County Commission shall also give consideration to the Engineer’s experience in landfill design and construction. The selection of the Independent Registered Engineer shall be in the sole and exclusive discretion of the Franklin County Commission.
14. *In Use.* For the purposes of these regulations a “cell” shall be in “use” if the design and construction plans for such cell have been approved by the Independent Professional Registered Engineer prior to the commencement of construction on any cell or any other component of the landfill and has had waste deposited therein at least ten (10) days prior to the effective date of any new regulation or amendment of the existing regulations. As set forth in the construction

Adopted on December 14th, 2000

Effective on January 1st, 2001

10.13

Revised 9/29/05; 5/10/07; 3/1/10; 9/20/11; 10/25/11; 04/24/2012

requirements, construction of a new “cell” shall not commence prior to the capacity level of all active cells being filled to the level of 70%, except as provided in Section C(7)(b) below.

15. *Leachate*. Liquid that has passed through or emerged from solid waste and contains soluble, suspended or miscible materials removed from such waste.
16. *Leachate Collection and Removal System*. Any combination of landfill base slopes, liners, permeable zones, pipes, sumps, pumps or retention structures that is designed, constructed and maintained to monitor leachate generation in a solid waste disposal area and collect and remove leachate as necessary to reduce leachate depth over a landfill base.
17. *License Fee*. The initial and annual fee set forth in Section C (4)(c) below, which must be paid by the owner/operator to obtain the initial license to construct and operate a Utility Waste Landfill or a Non-Utility Waste Landfill and the annual renewal required for such license.
18. *License to Operate*. Permission granted by the Franklin County Commission for an owner/operator to operate a Utility Waste Landfill in a given area. Licenses shall only be issued to owners/operators of facilities which are designed, constructed and operated in compliance with these regulations.
19. *Natural Water Table*. The level at which water stands in a fully saturated unconfined aquifer as measured by shallow piezometers or wells. The natural water table is under static hydrologic conditions and uninfluenced by groundwater pumping or other engineered activities.
20. *Non-Utility Waste Landfill*. A parcel of land, or structure specifically designed and built as a landfill, used for the disposal of waste materials. A non-utility waste landfill can be built into or on top of the ground provided that waste materials are isolated from the surrounding environment (groundwater, air, surface water). This isolation is accomplished through the use of a composite bottom liner and a daily covering of clean soil. The operators of all non-utility waste landfills are strongly encouraged to provide set aside areas for plastic, glass, metal, cardboard and paper recycling facilities.
21. *Surface Water*. All water naturally open to atmosphere (rivers, lakes, reservoirs, ponds, streams, impoundments, seas, estuaries, etc.)
22. *Utility Waste Landfill*. Any parcel of land on which are situated any improvements constructed or used for management, reclamation or recycling of fly ash waste, bottom ash waste, slag waste, flue gas emission control waste or other wastes generated in connection with the combustion of coal and other fossil fuels, or uses in support thereof or accessory thereto, including, without limitation, water retention and management areas.
23. *Yard Waste*. Leaves, grass clippings, yard and garden vegetation. Yard waste shall not include stumps, roots or shrubs with intact root balls.
24. *Waste Materials*. The accumulation of non-hazardous materials including but not necessarily limited to:

Adopted on December 14th, 2000

Effective on January 1st, 2001

10.14

Revised 9/29/05; 5/10/07; 3/1/10; 9/20/11; 10/25/11; 04/24/2012

- a. Animal, fruit and vegetable matter that attends the preparing, cooking, delivering in or storing of fruits, fowls or vegetables.
- b. Common household, commercial and industrial trash items such as but not limited to paper, cardboard, plastic, etc.

B. Regulations Concerning Non-Utility Waste Landfills.

1. Conditional Use: Non-Utility Waste Landfills shall be permitted only in Agricultural Non-Urban (ANU) zoning districts and Industrial Zoning districts and then only when a Conditional Use Permit (CUP) is obtained therefore. Any Conditional Use Permit pertaining to a Non-Utility Waste Landfill shall include the obligation to meet all design, construction, maintenance and licensing requirements set forth in these regulations as well as addition to any additional requirements mandated by the planning and zoning commission.
2. Design and Construction Standards: In addition to the specific requirements as hereinafter set forth, all Non-Utility Waste Landfills shall be designed and constructed in accordance with all applicable solid waste landfill regulations currently in effect or as may hereafter be adopted by the Missouri Department of Natural Resources. Specific design and construction requirements are:
 - a. Non-Utility Waste Landfills shall be no less than 1000 feet from the nearest residential structure and no less than 300 feet from the property line of the nearest adjoining property. For the purposes of these regulations, all distances shall be determined by the plans for the landfill submitted to Franklin County in conjunction with the application for the Conditional Use Permit. Any landfill which expands closer to the nearest residential structure or property line than the requirements hereof shall result in the owner/operator being subject to the daily penalty as hereinafter set forth and/or revocation of the conditional use permit. Within the three hundred (300) foot setback area there shall be a buffer of natural vegetation of no less than twenty-five (25) feet. The composition and location of the buffer shall be contained in the initial design plans.
 - b. All plans for Non-Utility Waste Landfills shall be reviewed by an Independent Registered Professional Engineer selected by the County to review and approve plans and monitor operations of the landfill. The owner/operator of landfill shall be responsible for all costs and fees associated with the Independent Registered Professional Engineer. The fees and expenses charged by the Independent Registered Professional Engineer must be in line with the industry standards for Franklin County.
 - c. No Conditional Use Permit application shall be considered by Franklin County unless the application is accompanied by an Environmental Impact Study prepared by a professional engineer with respect to the proposed site. The Environmental Impact Study must address, at a minimum, the following:
 - i. The composition of the underlying soil and bedrock.
 - ii. The flow of surface water over the site.

Adopted on December 14th, 2000

Effective on January 1st, 2001

10.15

Revised 9/29/05; 5/10/07; 3/1/10; 9/20/11; 10/25/11; 04/24/2012

- iii. The impact of the proposed landfill on the local vegetation, wetlands and wildlife.
 - iv. The potential impact on historical and/or archeological conditions on the proposed site.
 - v. Any necessary wetlands mitigation must be, if at all possible, performed on site.
 - vi. The height limitation to be placed upon the depository of accepted waste.
- d. A complete “closure” plan must also be submitted at the time the application is filed. All closure plans shall be prepared in accordance with all applicable regulations of the Missouri Department of Natural Resources and shall be reviewed and approved by the Independent Registered Professional Engineer prior to any application being set for a hearing.
 - e. Prior to any Conditional Use Permit being considered at a public hearing the applicant shall pay for the completion of a traffic impact study. The study shall be performed by a Registered Professional Engineer selected by the County shall be submitted as part of the record at the public hearing.
3. Maintenance and Operation: All Non-Utility Waste Landfills shall be maintained and operated in accordance with the following specific requirements as well as all applicable regulations as adopted by MoDNR and which are in effect as of the date the application is submitted. In the event of a conflict between the specific requirements hereof and MoDNR regulations, the more restrictive shall control. The specific requirements are:
- a. All waste shall be compacted to reduce the volume of waste in the Landfill. Compaction shall meet the specifics, if any, adopted by MoDNR.
 - b. All waste shall be covered daily with appropriate amounts of clean soil.
4. Licensing: After an application for a Conditional Use Permit for a Non-Utility Waste Landfill is approved but prior to any construction starting the owner/operator shall apply for a permit to operate a landfill. In addition to the Conditional Use Permit Approval, the permit application shall be accompanied by a copy of the operating policy of the landfill, a copy of all design and construction plans and a permit fee of \$25,000.00. The permit shall be subject to annual renewal. No permit shall be renewed if there is any existing violation and/or any unpaid penalty. The renewal application shall be accompanied by an annual renewal fee of \$10,000.00. All permit fees shall be used to support the Environmental Resource Officer and his or her office. No construction shall be commenced until the Independent Registered Professional Engineer has approved all design and construction plans.

Adopted on December 14th, 2000

Effective on January 1st, 2001

10.16

Revised 9/29/05; 5/10/07; 3/1/10; 9/20/11; 10/25/11; 04/24/2012

5. Severability and Savings Clause: Any action by a court of competent jurisdiction which results in a finding that a portion, paragraph or section of these regulations is invalid and/or unenforceable shall not operate to void the entirety of the regulations. In the event of such action, these regulations shall be construed as if the provision found to be invalid or unenforceable never existed as a part of these regulations.
6. Penalty: The County Environmental Resource Officer shall have the authority to assess a daily penalty for the violation of these regulations. The County Environmental Resource Officer shall not assess any penalty without first notifying the owner/operator of the in writing and thereafter allowing suitable opportunity as determined by the County Environmental Resource Officer after consultation with representatives of the owner/operator and, if needed, the Independent Registered Professional Engineer retained for the project. If an agreement as to a reasonable “cure” period cannot be achieved then in such event the County Environmental Officer shall establish the “cure” period. There shall be a fine of \$1,000.00 per day for each and every day an identified violation is not rectified. All penalties shall be paid into the General Fund of the County and shall be credited to a dedicated fund to be known as the “Environmental Mitigation Fund”. Any not paid within ninety (90) days after it is assessed shall result in the operating license for the landfill being revoked.

C. Regulations Concerning Utility Waste Landfills

1. Permitted Use: Notwithstanding any other provision of the Franklin County Unified Land Use Regulations to the contrary, Utility Waste Landfills are a permitted use in every Zoning District of the County, excepting the “Suburban Development”, “Residential Development” and “Residential Development 2” Zoning Districts provided that any such Utility Waste Landfill comply with all the regulations in this Section 238, including, without limitation;
 - a. A portion of any Utility Waste Landfill must be contiguous to the boundary of the property upon which a public utility power generation plant is situated.
 - b. The land which is to be utilized as an Utility Waste Landfill site and the power generation plant site must at all times be under common ownership.
 - c. All Utility Waste Landfills shall be developed and constructed in sections referred to as “cells” as hereinafter set forth.
 - d. All Utility Waste Landfills shall be subject to the provisions hereinafter set forth regarding methods of construction, monitoring, inspections, licensing, operations and penalties.
 - e. Only “cells” which are already in use as of the date new regulations are adopted shall be considered to be “grandfathered” as such term is defined in these regulations. Franklin County reserves the right to amend these Regulations on an as needed basis from and after the effective date hereof with regard to the prospective requirements for design, construction and maintenance of all cells which are not “in use” as such term is defined within these Regulations as of the time the amendment is adopted.

Adopted on December 14th, 2000

Effective on January 1st, 2001

10.17

Revised 9/29/05; 5/10/07; 3/1/10; 9/20/11; 10/25/11; 04/24/2012

2. Waste Accepted: Only wastes described in the definition of Utility Waste Landfill, above (“Utility Waste”), may be deposited in Utility Waste Landfill. All Utility Waste Landfills which are to be operated in Franklin County, Missouri shall accept no Utility Waste other than that which is generated by the plant situated in Franklin County which is located on property which is contiguous to the site on which the Utility Waste Landfill is to be situated as required in Section C(1)(a) above. In addition to the foregoing prohibition against depositing Utility Waste from any such non-contiguous facility, as required in Section C(1)(a) above (“Non-Contiguous Facility”), under no circumstances shall Utility Waste be brought onto the site from any Non-Contiguous Facility for any other purpose. It is the declared policy of Franklin County that the purpose in so restricting access to and use of any Utility Waste Landfill which is operated in Franklin County is to minimize the intentional or unintended distribution of fly ash and other Coal Combustion Products on, across or over the public roadways of Franklin County as well as the property owned by the citizens and residents of Franklin County.

3. Design and Construction: All design and construction of Utility Wastes Landfills shall be in accordance with Missouri 10 CSR 80-11.010 et seq., (Missouri Utility Waste Landfill Regulations) as they are written as of the effective date hereof or as they may hereafter be amended, subject to the rules in “grandfathering” as set forth in these regulations. In the event of a conflict between these regulations and the regulations adopted by the Missouri Department of Natural Resources, the more restrictive shall control.
 - a. Plans, addendums, as-built drawings or other documents which describe the design, construction, operation, or closure of a Utility Waste Landfill shall be prepared by a professional engineer which shall be stamped or sealed by such professional engineer and shall be submitted to the Independent Registered Professional Engineer selected by Franklin County for review and approval at the time that an application to operate a Utility Waste Landfill is submitted. Under no circumstances shall any construction of any component of a Utility Waste Landfill be commenced prior to the approval of all designs, plans, addendums, construction documents by the Independent Registered Professional Engineer. All fees and expenses associated with the review by the Independent Registered Professional Engineer shall be compatible with industry standards for the area and shall be paid for by the entity which has submitted the plans.
 - b. All Utility Waste Landfills shall be built and constructed in “cells”.
 - c. Each Utility Waste Landfill cell shall have a composite liner consisting first of an outer layer of clay or compacted soil component at least two (2) feet in depth and which meets the hydraulic conductivity and other standards required by the applicable provisions of Missouri Department of Natural Resources regulations currently in existence or prospectively as they may hereafter be amended. The clay or composite soil component at the base of the Utility Waste Landfill shall be at least two (2) feet above the Natural Water Table in the site area. Each Utility Waste Landfill cell shall include a second (inner) component which shall be constructed of a minimum 30-mil flexible membrane liner (FML). The FML component shall be required to be installed

Adopted on December 14th, 2000

Effective on January 1st, 2001

10.18

Revised 9/29/05; 5/10/07; 3/1/10; 9/20/11; 10/25/11; 04/24/2012

in direct and uniform contact with the compacted soil component.

- d. All “cells” shall be designed and constructed so that they shall be protected by an exterior berm meeting the following criteria:
 - i. The top of the berm at a minimum shall be equal to the five hundred (500) year flood level in the area of the proposed Utility Waste Landfill.
 - ii. All designs of and materials proposed for use in construction of each berm shall be approved by the Independent Registered Professional Engineer retained for the project, for compliance with the requirements of this Section 238. All berms shall be constructed of concrete or cement-based material sufficiently thick for the purpose intended and approved by the Independent Registered Professional Engineer. Only fly ash produced at the contiguous power generating plant may be used in the manufacturing of concrete or other products to be used for the construction of any berm or cell. It is the expressed intent of these regulations that fly ash or other CCRs, whether encapsulated or not, produced at facilities other than the one which is contiguous to the Utility Waste Landfill, shall not be used in the construction of any berm, wall, cell, containment area or any other structure which is part of the Utility Waste Landfill as described above.
 - iii. In-place waste material shall be compacted and stabilized so that such waste is able to counter-balance and mitigate the uplift pressures to withstand flood events.
- e. All Utility Waste Landfills shall include a leachate collection system which shall be designed and constructed in the manner required by Missouri Department of Natural Resources (MDNR) and as approved by the Independent Registered Professional Engineer for compliance with the requirements of this Section 238.
- f. All Utility Waste Landfills shall have a ground water monitoring system capable of monitoring the ground water quality around the entire perimeter of the proposed landfill. The Independent Registered Professional Engineer shall how many up-gradient and down-gradient monitoring wells shall be required to comply with the requirements of this Section 238, but in no event shall the number be less than that which would be required by Missouri Department of Natural Resources regulations. The Independent Registered Professional Engineer shall subcontract this duty, if necessary, to a professional geologist registered in Missouri.
- g. The construction of the initial cell or cells and all cells shall be monitored by the Independent Registered Professional Engineer retained for the project. Such engineer shall have the authority to stop construction if it is believed that construction is not being performed in accordance with the plans approved under the Section 238.
- h. The design of any Utility Waste Landfill shall include a foot setback area from all

Adopted on December 14th, 2000

Effective on January 1st, 2001

10.19

Revised 9/29/05; 5/10/07; 3/1/10; 9/20/11; 10/25/11; 04/24/2012

property lines not under common ownership with the Landfill site. The setback area shall contain a buffer of natural vegetation not less than 25 feet wide. Any necessary wetlands mitigation must be, if at all possible, performed on site.

4. Licensing of Utility Waste Landfill: All Utility Waste Landfills shall be subject to the requirement to obtain an operating license prior to the commencement of operations and a license annually thereafter on the anniversary date the license was originally issued. With respect to the construction of a new Utility Waste Landfill. No construction of any component shall be commenced without the prior approval of the design and construction plans by the Independent Registered Professional Engineer. In order to obtain or renew a license the owner/operator must meet the following requirements:
 - a. The original construction and all additions must have been approved by the Independent Registered Professional Engineer, or his or her successor, for compliance with the requirements of this Section 238.
 - b. The owner/operator must have submitted to and have successfully passed all tests required by Franklin County and the Missouri Department of Natural Resources. Tests required by Franklin County shall be in addition to those required by MoDNR, provided that any additional test required by Franklin County must not be in conflict with any tests required by the Missouri Department of Natural Resources. The purpose of this requirement is to insure that all tests results are submitted to and on record with Franklin County in a timely fashion.
 - c. The owner/operator must submit the annual fee of \$50,000.00 with the application and must have no fines or penalties unpaid. The annual fee of \$50,000.00 shall be used to fund in part, the position of the County Environmental Resource Officer, who shall, among other duties, assist the Independent Registered Professional Engineer retained for the project in the inspection and monitoring of the Utility Waste Landfill.
5. All Utility Waste Landfills shall be operated in such a manner so as to minimize the impact of operations at all times on the citizens and inhabitants of Franklin County, Missouri which shall be demonstrated by explicit compliance with these regulations, generally accepted engineering standards and permitting requirements of the Missouri Department of Natural Resources. The Owner/Operator of the Utility Waste Landfill shall insure that at all times each of the following components are operating properly:
 - a. Leachate Collection System;
 - b. Ground Water Monitoring;
 - c. Liner system; and
 - d. All components of the berm system. The County Environmental Resource Officer shall periodically inspect all components of the system for compliance with this Section 238 and shall immediately report any violations or deficiencies to the owner/operator with

Adopted on December 14th, 2000

Effective on January 1st, 2001

10.20

Revised 9/29/05; 5/10/07; 3/1/10; 9/20/11; 10/25/11; 04/24/2012

a notice directing that the deficiency must be corrected. After discussing such deficiency with the owner/operator and with the project Independent Registered Professional Engineer, a deadline for correcting the deficiency shall be established. In the event the deficiency is not corrected by such deadline or the extended deadline if granted by the Environmental Resource Officer, then the facility shall be subject to a penalty as hereinafter set forth.

6. **Monitoring and Annual Inspections:** The owner/operator shall be required to perform all monitoring as required by MoDNR and shall be subject to routine inspections as set forth in these regulations. Any deficiency discovered as a result of monitoring or inspecting which is not remedied as directed shall subject the owner/operator to daily penalties as hereinafter set forth.
7. **Operations:** All Utility Wastes Landfills shall be operated in accordance with these regulations and with all requirements of the regulations established by MoDNR, as they currently exist or as they be hereafter amended, subject to the provisions in this regulations on what is or is not “grandfathered”. In the event of a conflict between these regulations and those promulgated by MoDNR, the more restrictive shall control.
 - a. **CCR Removal:** If the owner/operator of an Utility Waste Landfill desires to remove fly ash or other CCR’s from the landfill site the owner/operator shall be subject to the following requirements:
 - i. All CCR’s shall be removed in sealed, container trucks. Dump trucks or similar vehicles with only “tarp” coverings shall not be permitted. The owner/operator of any Utility Waste Landfill shall notify the Environmental Resource Officer of its intention to remove CCRs from the site and shall identify the vehicles which are intended to transport CCRs. Prior to loading CCRs onto any vehicle, the Environmental Resource Officer must inspect and approve each of the intended vehicles. There shall be a truck washing facility at or near the exit from the Utility Waste Landfill. All trucks filled with residue shall be washed prior to leaving the site.
 - ii. As part of the original plan, or any amendment thereto, the owner/operator shall identify the primary route and secondary route over which the vehicles shall travel. Prior to any CCR being transported the Independent Registered Professional Engineer retained by the County shall cause a traffic impact analysis to be performed at the expense of the landfill owner/operator. The Franklin County Commission shall direct which, if any, of the recommendations or findings of the impact study shall be implemented prior to permission being granted to transport CCR’s away from the landfill site. All transport routes shall be selected with the goal of minimizing fugitive dust from affecting residential property and with minimizing the possibility of damage to roadways and other public infrastructure.
 - iii. Under no circumstances shall CCR’s or other residue from coal combustion from facilities other than the utility power generation plant as described in

Adopted on December 14th, 2000

Effective on January 1st, 2001

10.21

Revised 9/29/05; 5/10/07; 3/1/10; 9/20/11; 10/25/11; 04/24/2012

Section C(1)(a) above be deposited in an Utility Waste Landfill in Franklin County, Missouri. By applying for a license the owner/operator agrees to not deposit Utility Waste anywhere on the Utility Waste Landfill outside of the approved cells and associated berm, except during the construction period for materials permitted under Section C(3)(d)(ii) above.

- b. Cell usage: No new cell shall be constructed prior to the filling of all active cells with waste material to 70% of each such active cells total capacity. In the event generally accepted Utility Waste Landfill engineering standards require the commencement of construction of a new cell prior to the capacity level of active cells reaching 70% the owner/operator of the landfill shall submit to Franklin County Commission a request to proceed with the construction of new cells. The request shall include an analysis in support of such request prepared by a registered professional engineer with experience in landfill engineering. The County Commission shall either approve the request or shall submit the request to the Independent Registered Professional Engineer retained for the project for his or her recommendation. Under no circumstances shall the construction of a new cell be commenced without prior notification to the County Environmental Resource Officer. The notification from the owner/operator shall be submitted by a registered professional engineer on behalf of the owner/operator and shall contain an affidavit signed by the registered professional engineer to the effect that the new cell or cells shall be constructed in accordance with all applicable requirements as they exist on the date of the notification.
 - c. CCP Usage: All owners/operators of Utility Waste Landfills are encouraged to maximize beneficial usage of CCPs. The beneficial usage should focus on “on site” usage of the CCPs produced at the contiguous generating plant in order to further minimize the transportation of Coal Combustion Products.
8. Severability and Savings Clause: Any action by a court of competent jurisdiction which results in a finding that a portion, paragraph or section of these regulations is invalid and/or unenforceable shall not operate to void the entirety of the regulations. In the event of such action, these regulations shall be construed as if the provision found to be invalid or unenforceable never existed as a part of these regulations.
9. Penalty: The County Environmental Resource Officer shall have the authority to assess a daily penalty for the violation of these regulations. The County Environmental Resource Officer shall not assess any penalty without first notifying the owner/operator of the violation in writing and thereafter allowing suitable opportunity as determined by the County Environmental Resource Officer after consultation with representatives of the owner/operator and, if needed, the Independent Registered Professional Engineer retained for the project. If an agreement as to a reasonable “cure” period cannot be achieved then in such event the County Environmental Resource Officer shall establish the “cure” period. There shall be a fine of \$1,000.00 per day for each and every day an identified violation is not rectified. All penalties shall be paid into the General Fund of the County and shall be credited to a dedicated fund to be known as the “Environmental Mitigation Fund”. Any penalty not paid within ninety (90) days after it is assessed shall result in the operating license for the landfill being revoked.

Adopted on December 14th, 2000

Effective on January 1st, 2001

10.22

Revised 9/29/05; 5/10/07; 3/1/10; 9/20/11; 10/25/11; 04/24/2012

Article 3: Administrative Mechanisms

Part 1. Planning and Zoning Commission

Section 21: Appointment and Terms of Planning and Zoning Commission Members

The Planning and Zoning Commission, previously established by the County Commission, pursuant to Chapter 64.805 and 64.860, RSMo, does and shall consist of the County Highway Administrator and one resident appointed by the County Commission from the unincorporated part of each township of the County (the appointed members). The term of each appointed member shall be four (4) years or until his successor takes office. Vacancies may be filled for the unexpired term only. The term of the other members shall be for the duration of their tenure of their official positions. Appointed members may be reappointed to successive terms without limitation. [64.805]

Section 22: Meetings of the Planning and Zoning Commission

- (a) The Planning and Zoning Commission shall establish a regular meeting schedule and shall meet frequently enough so that it can take action in conformity with Section 66 (Applications to be Processed Expeditiously).
- (b) Since the Commission has decision making authority, it shall conduct its meetings in accordance with the procedures in Articles 3 and 4.
- (c) Minutes shall be kept of all proceedings.
- (d) All meetings shall be open to the public and the agenda shall be made available in advance of the meeting.

Section 23: Quorum and Voting

- (a) A quorum for the Planning and Zoning Commission shall consist of a majority of the membership (excluding vacant seats). A quorum is necessary for the Commission to take official action.
- (b) All actions of the Commission shall be taken by majority vote, a quorum being present.
- (c) A roll call vote shall be taken upon the request of any member.

Section 24: Planning and Zoning Commission Officers

- (a) The Commission shall elect its chairman and other officers annually, and shall have authority to employ such assistants and technical advisors as it considers necessary within the limits of its budget appropriations. [64.810]
- (b) The officers may take part in all deliberations and vote on all issues.

Adopted on December 14th, 2000
Effective on January 1st, 2001
Revised on 9/29/05, 9/1/09, and 9/20/2011

Section 25: Powers and Duties of the Planning and Zoning Commission

(a) The Planning and Zoning Commission shall have the following powers and duties:

(1) To prepare and submit to the County Commission for its approval a master plan for the physical development of the County and recommend amendments of said plan from time to time as it deems in the County's best interest; [64.815]

(2) To consider all requests for conditional use permits and subdivision approval in the manner prescribed herein;

(3) To make recommendations to the County Commission on its own initiative or upon the request of the County Commission to amend, supplement, change or repeal these regulations or any part thereof;

(4) To make recommendations regarding zoning changes initiated by staff, Commissioners, or other applicants;

(5) To make decisions regarding revocations of Conditional Use Permits as initiated by staff.

(b) The Planning and Zoning Commission may adopt rules governing its procedures and operations not inconsistent with the provisions of these regulations. [64.810]

Section 26: Advisory Committees

(a) From time to time, the County Commission may appoint one or more individuals to help the Planning and Zoning Commission carry out its planning responsibilities with respect to a particular subject area. By way of illustration, without limitation, the County Commission may appoint advisory committees to consider the thoroughfare plan, bikeway plans, housing plans, economic development plans, etc.

(b) Members of such advisory committees shall sit as nonvoting members of the Planning and Zoning Commission when such issues are being considered and lend their talents, energies, and expertise to the Commission. However, all formal recommendations to the County Commission shall be made by the Planning and Zoning Commission.

(c) Nothing in this section shall prevent the County Commission from establishing independent advisory groups, committees, or commissions to make recommendations on any issue directly to the County Commission.

Adopted on December 14th, 2000
Effective on January 1st, 2001
Revised on 9/29/05, 9/1/09, and 9/20/2011

Part 2. Board of Zoning Adjustment

Section 29: Appointment and Terms of Board of Zoning Adjustment Members

- (a) A board of Zoning Adjustment (the **Board**) has previously been established pursuant to Section 64.870 RSMo. The Board membership shall consist of five residents of the County, but not more than two shall be residents of the incorporated area of the county and not more than one member may be a member of the county zoning commission.
- (b) The membership of the first Board appointed shall serve respectively: one for one (1) year, one for two (2) years, one for three (3) years, and two for four (4) years. Thereafter, members shall be appointed for terms of four (4) years each. Members shall be removable and vacancies shall be filled in accordance with Section 64.870 RSMo.
- (c) Members may be reappointed to successive terms without limitation.
- (d) Members may be removed by the County Commission at any time for failure to attend three consecutive meetings or for failure to attend 30 percent of the meetings within any 12 month period or for any other good cause related to performance of duties. [64.870]
- (e) If a member moves outside the unincorporated Franklin County, that shall constitute a resignation from the board, effective upon the date a replacement is appointed.
- (f) After the effective date of these regulations, no member of the Board of Zoning Adjustment shall also be a member of the Planning and Zoning Commission.

Section 30: Meetings of the Board of Zoning Adjustment

- (a) The Board shall establish a regular meeting schedule and shall meet frequently enough so that it can take action in conformity with Section 68 (Applications to be Processed Expeditiously).
- (b) The Board shall conduct its meetings in accordance with the procedures set forth in Articles 3 and 4.
- (c) All meetings of the Board shall be open to the public, and the agenda for shall be made available in advance of the meeting.

Section 31: Quorum

- (a) A quorum for the Board shall consist of the number of members equal to four-fifths of the board membership (excluding vacant seats). A quorum is necessary for the Board to take official action.
- (b) A member who has withdrawn from the meeting without being excused as provided in Section 32 shall be counted present for purposes of determining whether a quorum is present.

Adopted on December 14th, 2000
Effective on January 1st, 2001
Revised on 9/29/05, 9/1/09, and 9/20/2011

Section 32: Voting

(a) All actions of the Board shall be taken by a concurring vote of four-fifths of the board membership shall be necessary to reverse any order, requirement, decision, or determination of the Administrator or to decide in favor of the applicant any matter upon which it is required to pass or to grant any variance.

(b) Once a member is physically present at a board meeting, any subsequent failure to vote shall be recorded as an affirmative vote unless the member has been excused in accordance with Subsection (c) or has been allowed to withdraw from the meeting in accordance with Subsection (d).

(c) A member may be excused from voting on a particular issue by majority vote of the remaining members present under the following circumstances:

(1) If the member has a direct financial interest in the outcome of the matter at issue, or

(2) If the matter at issue involves the member's own official conduct, or

(3) If participation in the matter might violate the letter or spirit of a member's code of professional responsibility, or

(4) If a member has such close personal ties to the applicant that the member cannot reasonably be expected to exercise sound judgment in the public interest.

(d) A member may be allowed to withdraw from the entire remainder of a meeting by majority vote of the remaining members present for any good and sufficient reason other than the member's desire to avoid voting on matters to be considered at that meeting.

(e) A motion to allow a member to be excused from voting or excused from the remainder of the meeting is in order only if made by or at the initiative of the member directly affected.

(f) A roll call vote shall be taken upon the request of any member.

Section 33. Board of Zoning Adjustment Officers

(a) At its first regularly scheduled meeting in May, the Board shall, by majority vote of its membership (excluding vacant seats) elect one of its members to serve as chairman and preside over the Board's meetings and one member to serve as vice-chairman. The persons so designated shall serve in these capacities for terms of one year. Vacancies may be filled for the unexpired terms only by majority vote of the board membership (excluding vacant seats). [64.870]

(b) The chairman or any member temporarily acting as chairman may administer oaths to witnesses coming before the Board.

(c) The chairman and vice-chairman may take part in all deliberations and vote on all issues.

Adopted on December 14th, 2000
Effective on January 1st, 2001
Revised on 9/29/05, 9/1/09, and 9/20/2011

Section 34: Powers and Duties of the Board of Zoning Adjustment

(a) The Board shall hear and decide:

(1) Appeals from any order, decision, requirement, or interpretation made by the Administrator, as provided for in Section 84. [64.870(1)]

(2) Applications for variances, as provided in Section 83. [64.870(3)]

(3) Questions involving interpretations of the zoning map, including disputed district boundary lines and lot lines, as provided in Section 88. [64.870(2)]

(4) Any other matter the Board is required to act upon by any other county regulation or state law. [64.870(2)]

(b) The Board may adopt rules and regulations governing its procedures and operations not inconsistent with the provisions of these regulations. [64.870]

Part 3. Land Use Administrator and Planning Director

Section 37: Land Use Administrator

Except as otherwise specifically provided, primary responsibility administering and enforcing these regulations may be assigned by the County Commission to one or more individuals. The person or persons to whom these functions are assigned shall be referred to in these regulations as the ■Land Use Administrator• or ■Administrator•. The term ■staff• or ■planning staff• is sometimes used interchangeably with the term ■Administrator•. [64.865]

Section 38: Appointment of the Planning Director

(a) The County Commission shall appoint a Planning Director. The Planning Director shall be an employee of Franklin County, subject to the personnel policies established by the County Commission.

(b) The Planning Director shall be the administrative head of the Planning and Zoning Department. He shall be responsible for the day-to-day operations of the Department, the administration of these regulations, and the hiring/firing of such staff as the budget process allows.

Sections 39: reserved

Part 4. County Commission

Section 40: The County Commission

(a) In considering proposed changes to the text of these regulations or in the zoning map, the County Commission acts in its legislative capacity.

(b) Unless otherwise specifically provided in these regulations, in considering amendments to these

Adopted on December 14th, 2000
Effective on January 1st, 2001
Revised on 9/29/05, 9/1/09, and 9/20/2011

regulations or the zoning map, the County Commission shall follow the regular, voting, and other requirements as set forth in other provisions of county codes or general law.

Sections 41 through 45: reserved

Part 5. Zoning and Conditional Use Permits

Section 46: Permits Required

(a) The use made of property may not be substantially changed (see Section 229), substantial clearing, grading, or excavation may not be commenced, and buildings or other substantial structures may not be constructed, erected, moved, or substantially altered except in accordance with and pursuant to one of the following permits:

(1) A zoning permit issued by the Administrator.

(2) A conditional use permit issued by the Planning and Zoning Commission.

(b) Zoning permits, conditional use permits, and sign permits are issued under these regulations only when a review of the application submitted, including any plans contained therein, indicates that the development will comply with these regulations if completed as proposed. Such plans and applications as are finally approved are incorporated into any permit issued and all development shall occur strictly in accordance with such approved plans and applications.

(c) Physical improvements to land to be subdivided may not be commenced except in accordance with the conditional use permit issued by the Planning and Zoning Commission (or modified by the County Commission) for major subdivisions or after final plat approval by the Planning Director for minor subdivisions.

(d) A zoning permit, conditional use permit, and sign permit shall be issued in the name of the applicant (except that applications submitted by an agent shall be issued in the name of the principal), shall identify the property involved and the proposed use, shall incorporate by reference the plans submitted, and shall contain any special conditions or requirements lawfully imposed by the permit issuing authority. All such permits shall be issued with respect to tracts of land in excess of three acres (except sign permits and zoning permits for single family and two-family residential uses) shall be recorded in the Franklin County Office of the Recorder of Deeds after execution by the record owner.

Section 47: No Occupancy, Use, or Sale of Lots Until Requirements Fulfilled

(a) Issuance of a conditional use permit or zoning permit authorizes the recipient to commence the activity resulting in a change in the use of the land (subject to obtaining a building permit) to commence work designed to construct, erect, move, or substantially alter buildings and other substantial structures, or to make necessary improvements to a subdivision.

(b) No zoning permit, conditional use permit, or sign permit shall be issued to any applicant while said applicant is in violation of any of the provisions of these regulations, unless permission therefor is specifically granted by the permit issuing authority. The only exception to this provision shall be for

Adopted on December 14th, 2000

Effective on January 1st, 2001

Revised on 9/29/05, 9/1/09, and 9/20/2011

permits specifically intended to remedy said violation(s).

Section 48: Who May Submit Permit Applications

(a) Applications for zoning, conditional use, or sign permits or subdivision approval will be accepted only from persons having the legal authority to take action in accordance with the permit or the subdivision approval or by persons who have permission from persons having the legal authority to take action. By way of illustration, in general this means that applications should be made by the owners or lessees of property, or their agents, or persons who have contracted to purchase property contingent upon their ability to acquire the necessary permits under these regulations, or the agents of such persons (who may make application in the name of such owners, lessees, or contract vendees).

(b) The Administrator may require an applicant to submit evidence of his authority to submit the application in accordance with Subsection (a) whenever there appears to be a reasonable basis for questioning this authority.

Section 49: Applications to Be Complete

(a) All applications for zoning permits, conditional use permits, and sign permits must be complete before the permit issuing authority is required to consider the application.

(b) Subject to Subsection (c), an application is complete when it contains all of the information that is necessary for the permit issuing authority to decide whether or not the development, if completed as proposed, will comply with all of the requirements of these regulations, and all fees are paid in full.

(c) In these regulations, detailed or technical design requirements and construction specifications relating to various type of improvements (streets, sidewalks, etc.) are set forth in one or more of the appendices to these regulations. It is not necessary that the application contain the type of detailed construction drawings that would be necessary to determine compliance with these requirements, so long as the plans provide sufficient information to allow the permit issuing authority to evaluate the application in the light of the substantive requirement set forth in this text of these regulations. However, whenever these regulations require a certain element of a development to be constructed in accordance with the detailed requirements set forth in one or more sections, then no construction work on such element may be commenced until detailed construction drawings have been submitted and approved by the Administrator. Failure to observe this requirement may result in permit revocation denial of final subdivision plat approval.

(d) The presumption established by these regulations is that all of the information set forth herein is necessary to satisfy the requirements of this section. However, it is recognized that each development is unique, and therefore the permit issuing authority may allow less information or require more information to be submitted according to the needs of the particular case. For applications submitted to the Planning and Zoning Commission, the applicant may rely on the recommendations of the Planning Director or Administrator as to whether more or less information than that set forth in Appendix A should be submitted.

(e) The Administrator shall make every effort to develop application forms, instructional sheets, checklists, or other techniques or devices to assist applicants in understanding the application requirements and the form and type of information that must be submitted. In classes of cases where a minimal amount of

Adopted on December 14th, 2000
Effective on January 1st, 2001
Revised on 9/29/05, 9/1/09, and 9/20/2011

information is necessary to enable the Administrator to determine compliance with these regulations, such as applications for zoning permits, the Administrator shall develop standard forms that will expedite the submission of the necessary plans and other required information.

Section 50: Staff Consultation Before Formal Application

(a) To minimize development planning costs, avoid misunderstanding or misinterpretation, and to ensure compliance with the requirements of these regulations, pre-application consultation between the developer and the planning staff is encouraged or required, as provided in this section.

(b) Before submitting an application for a conditional use permit authorizing a development that consists of or contains a major subdivision, the developer shall submit to the Administrator a sketch plan of such subdivision, drawn approximately to scale (1 inch = 100 feet). The sketch plan shall contain:

- (1) The name and address of the developer, and
- (2) The proposed name and location of the subdivision, and
- (3) The approximate total acreage of the proposed subdivision, and
- (4) The tentative street and lot arrangement, and
- (5) Topographic lines, and

(6) Any other information the developer believes necessary to obtain the informal opinion of the planning staff as to the proposed subdivision's compliance with the requirements of these regulations.

The planning staff shall meet, as needed, with the developer as soon as conveniently possible to review the sketch plan.

(c) Before submitting an application for any other permit, developers are strongly encouraged to consult with the planning staff concerning the application of these regulations to the proposed development.

Section 51: Staff Consultation After Application Submitted

(a) Upon receipt of a formal application for a zoning, conditional use permit, or for subdivision plat approval, the planning staff shall review the application and confer, as needed, with the applicant to ensure that he understands the planning staff's interpretation of the applicable requirements of these regulations, that he has submitted all of the information that he intends to submit, and that the application represents precisely and completely what he proposes to do.

(b) If the application is for a conditional use permit, the Administrator shall place the application on the agenda of the Planning and Zoning Commission when the applicant indicates that his application is as complete as he intends to make it. However, if the Administrator believes that the application is incomplete, he shall recommend to the Planning and Zoning Commission that the application be denied on that basis.

Adopted on December 14th, 2000
Effective on January 1st, 2001
Revised on 9/29/05, 9/1/09, and 9/20/2011

Section 52: Zoning Permits

(a) A completed application form for a zoning permit shall be submitted to the Administrator by filing a copy of the application with the Administrator (or when applying for a building permit, with the Franklin County Building Department, to be routed to the Administrator).

(b) The Administrator shall issue the zoning permit unless he finds, after reviewing the application and consulting with the applicant, that:

(1) The requested permit is not within his jurisdiction according to Article 7, or

(2) The application is incomplete, or

(3) If completed as proposed in the application, the development will not comply with one or more requirements of these regulations (not including those requirements concerning which a variance has been granted or those the applicant is not required to comply with under the circumstances specified in Article 6, Nonconforming Situations).

Section 53: Authorizing Use or Occupancy Before Completion of Development Under Zoning Permit

In cases when, because of weather conditions or other factors beyond the control of the zoning permit recipient (exclusive of financial hardship), it would be unreasonable to require the zoning permit recipient to comply with all of the requirements of these regulations prior to the commencing the intended use of the property or occupying any buildings, the Administrator may authorize the commencement of the intended use or the occupancy of buildings (insofar as the requirements of these regulations are concerned) if the permit recipient provides a performance bond or other security satisfactory to the Administrator to ensure that all of the requirements of these regulations will be fulfilled within a reasonable period (not to exceed 24 months) determined by the Administrator.

Section 54: Conditional Use Permits

(a) An application for a conditional use permit shall be submitted to the Planning and Zoning Commission by filing a copy of the application with the Administrator.

(b) Subject to Subsection (c), the Planning and Zoning Commission shall issue the requested permit unless it concludes, based upon the information submitted at the hearing, that:

(1) The requested permit is not within its jurisdiction according to Article 7, or

(2) The application is incomplete, or

(3) If completed as proposed in the application, the development will not comply with one or more requirements of these regulations (not including those the applicant is not required to comply with under the circumstances specified in Article 6, Nonconforming Situations), or

(c) Even if the Planning and Zoning Commission finds that the application complies with all other provisions of these regulations, it may still deny the permit if it concludes, based upon the information submitted at the hearing, that if completed as proposed, the development, more probably than not:

Adopted on December 14th, 2000
Effective on January 1st, 2001
Revised on 9/29/05, 9/1/09, and 9/20/2011

- (1) Will materially endanger the public health or safety, or
- (2) Will substantially injure the value of adjoining or abutting property, or
- (3) Will not be in harmony with the area in which it is to be located, or
- (4) Will not be in general conformity with the land use plan, highway master plan, or other plan officially adopted by the County Commission.

Section 55: Burden of Presenting Evidence; Burden of Persuasion

(a) The burden of presenting a complete application (which shall be complete, as described in Section 49 and 51) to the permit issuing authority shall be upon the applicant. However, unless the Planning and Zoning Commission informs the applicant at the hearing in what way the application is incomplete and offers the applicant an opportunity to complete the application (either at that meeting or at a continuation hearing), the application shall be presumed to be complete.

(b) Once a completed application has been submitted, the burden of presenting evidence to the permit issuing authority sufficient to lead it to conclude that the application should be denied for any reasons stated in Section 54(b)(1), 54(b)(3) or 54(c) shall be upon the party or parties urging this position, unless the information presented by the applicant in his application and at the public hearing is sufficient to justify a reasonable conclusion that a reason exists to so deny the application.

(c) The burden of persuasion on the issue of whether the development, if completed as proposed, will comply with the requirements of these regulations remains at all times with the applicant. The burden of persuasion on the issue of whether the application should be turned down for any of the reasons set forth in Section 54(c)(4) rests on the party or parties urging that the requested permit should be denied.

Section 56: reserved

Section 57: Recommendations on Conditional Use Permits

(a) When presented to the Planning and Zoning Commission, the application shall be accompanied by a report setting forth the planning staff's proposed findings concerning the application's compliance with Section 49 and other requirements of these regulations, as well as any staff recommendations for additional requirements to be imposed by the Planning and Zoning Commission. If the planning staff report proposes a finding or conclusion that the application fails to comply with Section 49 or any other requirement of these regulations, it shall identify the requirement in question and specifically state supporting reasons for the proposed findings or conclusions.

(b) The Planning and Zoning Commission shall consider the application and the attached staff report in a timely fashion, and may in its discretion, hear from the applicant or members of the public.

Section 58: Decisions on Conditional Use Permit Applications

In considering whether to approve an application for a conditional use permit, the Planning and Zoning

Adopted on December 14th, 2000
 Effective on January 1st, 2001
 Revised on 9/29/05, 9/1/09, and 9/20/2011

Commission shall proceed according to the following format:

(1) The Planning and Zoning Commission shall consider whether the application is complete. If no member moves that the application be found incomplete (specifying either the particular type of information lacking or the particular requirement with respect to which the application is incomplete) then this shall be taken as an affirmative finding by the Planning and Zoning Commission that the application is complete.

(2) The Planning and Zoning Commission shall consider whether the application complies with all of the applicable requirements of these regulations. If a motion to this effect passes, the Planning and Zoning Commission need not make further findings concerning such requirements. If such a motion fails or is not made then a motion shall be made that the application be found not in compliance with one or more of the requirements of these regulations. Such a motion shall specify the particular requirements the application fails to meet. Separate votes may be taken with respect to each requirement not met by the application. It shall be conclusively presumed that the application complies with all requirements not found by the Planning and Zoning Commission to be unsatisfied through this process.

(3) If the Planning and Zoning Commission concludes that the application fails to comply with one or more requirements of these regulations, the application shall be denied. If the Planning and Zoning Commission concludes that all such requirements are met, it shall issue the permit unless it adopts a motion to deny the application for one or more of the reasons set forth in Subsection 54(c). Such a motion shall propose specific findings, based upon the evidence submitted, justifying such a conclusion.

Section 59: reserved

Section 60: Additional Requirements on Conditional Use Permits

(a) Subject to Subsection (b), in granting a conditional use permit, the Planning and Zoning Commission, respectively, may attach to the permit such reasonable requirements in addition to those specified in these regulations as will ensure that the development in its proposed location:

- (1) Will not endanger the public health or safety,
- (2) Will not injure the value of adjoining or abutting property,
- (3) Will be in harmony with the area in which it is located, and
- (4) Will be in harmony with the area in which it is located, taking into consideration the following factors:
 - a. Whether or not or to what extent the proposed use is compatible with other uses in the immediately surrounding area;
 - b. Whether or not or to what extent the proposed use will impede the normal and orderly development and improvement of surrounding property for uses permitted in the district; and
 - c. Whether or not or to what extent will the proposed use generate air, noise, or visual pollution, which may adversely impact the immediately surrounding area.

Adopted on December 14th, 2000

Effective on January 1st, 2001

Revised on 9/29/05, 9/1/09, and 9/20/2011

Will be in conformity with the land use plan, highway master plan, or other plan officially adopted by the County Commission.

(b) The Planning and Zoning Commission may not attach additional conditions that modify or alter the specific requirements set forth in these regulations unless the development in question presents extraordinary circumstances that justify the variation from the specified requirements.

(c) Without limiting the foregoing, the Planning and Zoning Commission may attach to a permit a condition limiting the permit to a specified duration.

(d) All additional conditions or requirements shall be entered on the permit.

(e) All additional conditions or requirements authorized by this section. are enforceable in the same manner and to the same extent as any other applicable requirement of these regulations.

(f) A vote may be taken on application conditions or requirements before consideration of whether the permit should be denied for any of the reasons set forth in Subsections 54(b) or (c).

Section 61: Authorizing Use, Occupancy, or Sale Before Completion of Development Under Conditional Use Permits

(a) In cases when, because of weather conditions or other factors beyond the control of the conditional use permit recipient (exclusive of financial hardship), it would be unreasonable to require the permit recipient to comply with all of the requirements of these regulations prior to the commencing the intended use of the property or occupying any buildings, the Planning and Zoning Commission may authorize the commencement of the intended use or the occupancy of buildings if the permit recipient provides a performance bond or other security satisfactory to the Planning and Zoning Commission to ensure that all of the requirements of these regulations will be fulfilled within a reasonable period (not to exceed 24 months).

(b) When the Planning and Zoning Commission imposes additional requirements upon the permit recipient in accordance with Section 60 or when the developer proposes in the plans submitted to install amenities beyond those required by these regulations, the Planning and Zoning Commission may authorize the permittee to commence the intended use of the property or to occupy any building before the additional requirements are fulfilled or the amenities installed if it specifies a date by which or a schedule according to which such requirements must be met or each amenity installed and if it concludes that compliance will be ensured as the result of any one or more of the following:

(1) A performance bond or other security satisfactory to the Planning and Zoning Commission is furnished,

(2) A condition is imposed establishing an automatic expiration date on the permit, thereby ensuring that the permit recipient's compliance will be reviewed when the application for renewal is made,

(3) The nature of requirements or amenities is such that sufficient assurance of compliance is given by Section 114 (Penalties and Remedies For Violation) and Section 115 (Permit Noncompliance Actions).

Adopted on December 14th, 2000

Effective on January 1st, 2001

Revised on 9/29/05, 9/1/09, and 9/20/2011

Section 62: Completing Development in Phases

(a) If a development is constructed in phases or stages in accordance with this section, then, subject to Subsection (c), the provisions of Section 47 (No Occupancy, or Use Until Requirements Fulfilled) and Section 61 (exceptions to Section 47) shall apply to each phase or stage as if it were the entire development.

(b) As a prerequisite to taking advantage of the provisions of Subsection (a), the developer shall submit plans that clearly show the various phases or stages of the proposed development and the requirements of these regulations that will be satisfied with respect to each phase or stage.

(c) If a development that is to be built in phases or stages includes improvements that are designed to relate to, benefit, or be used by the entire development, then, as part of his application for development approval, the developer shall submit a proposed schedule for completion of such improvements. The schedule shall relate completion of such improvements to completion of one or more phases or stages of the entire development. Once a schedule has been approved and made part of the permit by the permit issuing authority, no land may be used, and no buildings may be occupied except in accordance with the schedule approved as part of the permit, provided that:

(1) If the improvement is one required by these regulations then the developer may utilize the provisions of Subsections 61(a)

(2) If the improvement is an amenity not required by these regulations or is provided in response to a condition imposed by the Planning and Zoning Commission, then the developer may utilize the provisions of Subsections 61(b).

Section 63: Transferability of Permits

(a) A conditional use permit or zoning permit may be conveyed with the land. Nothing in this Article shall be construed to alter the expiration date of permits or the authority of the Planning and Zoning Commission to revoke a permit.

(b) No persons (including successors or assigns of the person who obtained the permit) may make use of the land or structures covered by the permit except in accordance with the terms and conditions of that permit.

(c) A permit cannot be assigned or transferred to a different parcel of land.

(d) Every entity attempting to convey a conditional use permit or zoning permit shall give notice in writing to the Director within seventy-two (72) hours after having sold, transferred, given away, or otherwise disposed of an interest in or control of a parcel of land for which a permit has been issued. This notice shall include the name and address of the successor in interest or control of the parcel. Receipt of this notice shall not constitute acceptance of an invalid transfer.

Adopted on December 14th, 2000
Effective on January 1st, 2001
Revised on 9/29/05, 9/1/09, and 9/20/2011

Section 64: Lapse and Expiration of Permits.

(a) The Director may make the determination that a conditional use permit or zoning permit has lapsed according to the following criteria. No public hearing will be required. This decision may be appealed according to the procedures in Section 84.

(1) If no substantial construction, erection, alteration, demolition, or similar work is necessary and the use authorized by the permit has not commenced within one year, the conditional use permit or zoning permit shall lapse and become void.

(2) If less than 10 percent of the total cost of all construction, erection, alteration, demolition or similar work relating to the development authorized by the permit has been completed after a period of one year, the conditional use permit or zoning permit shall lapse and become void.

(3) If the permitted use has commenced and then is discontinued for one year, the conditional use permit or zoning permit shall lapse and become void.

(b) A conditional use permit shall be valid for a specific period of time if so stated in the permit. A permit may be renewed upon application for a Conditional Use Permit as per the procedure described in Section 54.

Section 65: Revocation of Conditional Use Permits

(a) A Conditional Use Permit may be revoked for any one of the following reasons:

(1) The permit holder made material misrepresentations or false statements of fact in the application or during the hearing on the application;

(2) The provisions or conditions of the Land Use Regulations have been violated;

(3) The conditions placed upon such use as part of the Conditional Use Permit approval are not being met; (In the case of an operating business revising or updating its permit, all conditions must be met within 6 months of the date of the decision unless otherwise stated in the permit.)

(4) The business or permit holder is in violation of any other laws or regulations; or

(5) Permit owner has commenced improvements in compliance with Section 64, but the approved use has not commenced within 2 years.

(b) Before a Conditional Use Permit is revoked, a written notice (by certified mail or personal delivery) that a violation has occurred shall be delivered to the permit holder. The notice shall afford the permit holder a specific time period to abate the violation or otherwise correct the problem. If the violation is not remedied, the permit holder will be notified of the date of a public hearing before the Planning and Zoning Commission. The second notice shall also be delivered in person or by certified mail.

(c) The Planning and Zoning Commission shall conduct a public hearing and make a decision on the matter in compliance with Sections 76-81 of these Regulations.

Adopted on December 14th, 2000
Effective on January 1st, 2001
Revised on 9/29/05, 9/1/09, and 9/20/2011

Section 66: Amendments to and Modifications of Permits

(a) Insignificant deviations from the permit (including approved plans) approved or issued by the Planning and Zoning Commission or the Administrator are permissible, and the Administrator may authorize such insignificant deviations. A deviation is insignificant if it has no discernible impact on neighboring properties, the general public, or those intended to occupy or use the proposed development.

(b) Minor design modifications or changes in permits (including approved plans) are permissible with the approval of the permit issuing authority. Such permission may be obtained without a formal application, public hearing, or payment of any additional fee. For purposes of this section, minor design modifications or changes are those that have no substantial impact on neighboring properties, the general public, or those intended to occupy or use the proposed development.

(c) All other requests for changes in approved plans will be processed as new applications. If such requests are required to be acted upon by the Planning and Zoning Commission, new conditions may be imposed in accordance with Section 60, but the applicant retains the right to reject such additional conditions by withdrawing his request for amendment, and may then proceed in accordance with the previously issued permit.

(d) The Administrator shall determine whether amendments to and modifications of permits fall within the categories set forth above in Subsections (a), (b), and (c).

(e) A developer requesting approval of changes shall submit a written request for such approval to the Administrator, and that request shall identify the changes. Approval of all changes must be given in writing.

Section 67: Reconsideration of Actions

(a) Whenever (i) the Planning and Zoning Commission disapproves a conditional use permit application, or (ii) the Board of Zoning Adjustment disapproves an application for a variance, on any basis other than the failure of the applicant to submit a complete application, such action shall not be reconsidered by the board at a later time unless the applicant clearly demonstrates that:

(1) Circumstances affecting the property that is the subject of the application have substantially changed, or

(2) New information is available that could not with reasonable diligence have been presented at a previous hearing. A request to be heard on this basis must be filed with the Administrator within the time for an appeal the Board of Zoning Adjustment or to circuit court, respectively. However, such a request does not extend the period within which an appeal must be taken.

(b) Notwithstanding Subsection (a), the Planning and Zoning Commission or Board of Zoning Adjustment may at any time consider a new application affecting the same property as an application previously denied. A new application is one that differs some substantial way from the one previously considered.

Adopted on December 14th, 2000

Effective on January 1st, 2001

Revised on 9/29/05, 9/1/09, and 9/20/2011

Section 68: Applications to be Processed Expeditiously

Recognizing that inordinate delays in acting upon applications may impose unnecessary costs on the applicant, the County shall make every reasonable effort to process applications as expeditiously as possible, consistent with the need to ensure that all development conforms to the requirements of these regulations.

Section 69: Maintenance of Common Areas, Improvements, and Facilities

The recipient of any zoning permit, conditional use permit, or his successor, shall be responsible for maintaining all common areas, improvements, or facilities required by these regulations or any permit issued in accordance with its provisions, except those areas, improvements, or facilities with respect to which a covenant of restrictions has been conveyed which requires that a ■homeowners• association• or some similar body becomes responsible for the common areas, improvements, or required facilities. As illustrations, and without limiting the generality of the foregoing, this means that private roads and parking areas, water and sewer lines, and recreational facilities must be properly maintained so that they can be used in the manner intended, and required vegetation and trees used for screening, landscaping, or shading must be replaced if they die or are destroyed.

Sections 70 through 75: reserved

Adopted on December 14th, 2000
Effective on January 1st, 2001
Revised on 9/29/05, 9/1/09, and 9/20/2011

Article 4: Hearing Procedures for Applications, Appeals, Variances

Part 1. Actions Before the Board of Zoning Adjustment and Planning and Zoning Commission

Section 76: Hearing Required on Variances and Appeals of Actions by the Administrator

Part A. Hearing Actions Before the Board of Zoning Adjustment

- (a) Before making a decision on an appeal from zoning enforcement action or interpretation, or an application for a variance, the Board of Zoning Adjustment shall hold a hearing on the appeal or application.
- (b) Subject to Subsection (c), the hearing shall be open to the public and all persons interested in the outcome of the appeal or application shall be given an opportunity to present evidence and arguments and ask questions of persons who testify.
- (c) The Board of Zoning Adjustment may place reasonable and equitable limitations on the presentation of evidence and arguments and the cross examination of witnesses so that the matter at issue may be heard and decided without undue delay.
- (d) The board may continue the hearing until a subsequent meeting and may keep the hearing open to take additional information up to the point a final decision is made. No further notice of a continued hearing need be published unless a period of six weeks or more elapses between hearing dates.

Part B. Hearing Actions Before the Planning and Zoning Commission

- (a) Before making a decision on a conditional use permit the Planning and Zoning Commission shall hold a hearing on the application.
- (b) Subject to Subsection (c), the hearing shall be open to the public and all persons interested in the outcome of the appeal or application shall be given an opportunity to present evidence and arguments and ask questions of persons who testify.
- (c) The Planning and Zoning Commission may place reasonable and equitable limitations on the presentation of evidence and arguments and the cross examination of witnesses so that the matter at issue may be heard and decided without undue delay.
- (d) The Planning and Zoning Commission may continue the hearing until a subsequent meeting and may keep the hearing open to take additional information up to the point a final decision is made. No further notice of a continued hearing need be published unless a period of six weeks or more elapses between hearing dates. A vote by a majority of those board members present will be made to determine whether the hearing shall be continued to a later date.

Adopted on December 14th, 2000
Effective on January 1st, 2001
Revised on 9/19/05 and 9/1/09

Section 77: Notice of Hearing

The Administrator shall give notice of any hearing required by Section 76 as follows:

- (1) Notice shall be given to the appellant or applicant and any other person who makes a written request for such notice by mailing to such persons a written notice not later than 7 days before the hearing.
- (2) Notice shall be given to neighboring property owners by mailing a written notice not later than 15 days before the hearing to those persons who have listed for taxation real property any portion of which is located within 600 feet of the lot that is the subject of the application or appeal.
- (3) The notice required by this section shall state the date, time, and place of the hearing, reasonably identify the lot that is the subject of the application or appeal, and give a brief description of the action requested or proposed.

Section 78: Evidence

- (a) The provisions of this section apply to all hearings for which a notice is required by Section 76.
- (b) All persons who intend to present evidence to the permit issuing board shall be sworn.
- (c) All findings and conclusions necessary to the issuance or denial of the requested permit or appeal (crucial findings) shall be based upon substantial evidence. Competent evidence (evidence admissible in a court of law) shall be preferred whenever reasonably available, but in no case may crucial findings be based solely upon incompetent evidence unless competent evidence is not reasonably available, the evidence in question appears to be particularly reliable, and the matter at issue is not seriously disputed.

Section 79: Modification of Application at Hearing

- (a) In response to questions or comments by persons appearing at the hearing or to suggestions or recommendations by the Planning and Zoning Commission or Board of Zoning Adjustment, the applicant may agree to modify his application, including the plans and specifications submitted.
- (b) Unless such modifications are so substantial or extensive that the board cannot reasonably be expected to perceive the nature and impact of the proposed changes without revised plans before it, the board may approve the application with the stipulation that the permit will not be issued until plans reflecting the agreed upon changes are submitted to the planning staff.
- (c) The determination whether a proposed modification is substantial or extensive is subject to the discretion of the hearing board. A vote by a majority of those board members present will be made to determine whether a new hearing is required.

Section 80: Record

- (a) A tape recording shall be made of all hearings required by Section 76, and such recordings shall be kept for at least two years. Accurate minutes shall also be kept of all such proceedings, but a transcript need not be made.

Adopted on December 14th, 2000
Effective on January 1st, 2001
Revised on 9/19/05 and 9/1/09

(b) All documentary evidence presented at a hearing as well as all other types of physical evidence shall be made a part of the record of the proceedings and shall be kept by the county for at least two years.

Section 81: Written Decision

(a) Any decision made by the Board of Zoning Adjustment or Planning and Zoning Commission regarding an appeal, variance, or issuance or revocation of a conditional use permit shall be reduced to writing and served upon the applicant or appellant and all other persons who make a written request for a copy.

(b) In addition to a statement of the board's ultimate disposition of the case and any other information deemed appropriate, the written decision shall state the board's findings and conclusions, as well as supporting reasons or facts, whenever these regulations require the same as a prerequisite to taking action.

Part 2. Actions Before the Board of Zoning Adjustment

Section 82: Appeals on Conditional Use Permit Decisions

(a) All appeals of conditional use permit decisions issued by the Franklin County Planning and Zoning Commission shall be submitted to the Franklin County Board of Zoning Adjustment for review in accordance with Section 64.870 RSMo.

(b) Any appeal of a conditional use permit decision must be filed not more than three months from the date of the written decision issued by the Planning and Zoning Commission.

(c) All such appeals shall be filed on forms provided for such purpose by the Franklin County Planning and Zoning Department, must be verified and must be accompanied by the appropriate filing fee which will from time to time be established by the County Commission. All such appeals shall be filed in the office of the Franklin County Planning and Zoning Department.

(d) Appeals from any decision issued by the Franklin County Board of Zoning Adjustment shall be filed with the Circuit Court of Franklin County in accordance with the provisions of Section 64.870 RSMo.

(e) The hearing procedures shall be the same as set forth in Sections 76 and 87 of the Unified Land-Use Regulations.

Section 83: Variances

(a) An application for a variance shall be submitted to the Board of Zoning Adjustment by filing a copy of the application with the Administrator in the Planning and Zoning Department. Applications shall be handled in the same manner as applications for conditional use permits in conformity with the provisions of Sections 48 and 49.

(b) A variance may be granted by the Board of Zoning Adjustment if it concludes that strict enforcement of the ordinance would result in practical difficulties or unnecessary hardships for the applicant and that, by granting the variance, the spirit of the regulations will be observed, public safety and welfare secured, and substantial justice done. It may reach these conclusions if it finds that:

Adopted on December 14th, 2000
Effective on January 1st, 2001
Revised on 9/19/05 and 9/1/09

(1) If the applicant complies strictly with the provisions of the ordinance, he can make no reasonable use of his property, and

(2) The hardship of which the applicant complains is one suffered by the applicant rather than by neighbors or the general public, and

(3) The hardship relates to the applicant's land, rather than personal circumstances, and

(4) The hardship is unique, or nearly so, rather than one shared by many surrounding properties, and

(5) The hardship is not the result of the applicant's own actions, and

(6) The variance will neither result in the extension of a nonconforming situation in violation of Article 6 nor authorize the initiation of a nonconforming use of land.

(c) In granting variances, the Board of Zoning Adjustment may impose such reasonable conditions as will ensure that the use of the property to which the variance applies will be as compatible as practicable with the surrounding properties.

(d) A variance may be issued for an indefinite duration or for a specified duration only.

(e) The nature of the variance and any conditions attached to it shall be entered on the face of the zoning permit, or the zoning permit may simply note the issuance of the variance and refer to the written record of the variance for further information. All such conditions are enforceable in the same manner (see Section 114) as any other applicable requirement of these regulations.

Section 84: Appeals From Actions of the Land Use Administrator

(a) An appeal from any final order or decision of the Administrator may be taken to the Board of Zoning Adjustment by any person aggrieved. An appeal is taken by filing with the Administrator and the Board of Zoning Adjustment a written notice of appeal specifying the grounds therefor. A notice of appeal shall be considered filed with the Administrator and the Board of Zoning Adjustment when delivered to the Planning and Zoning Department, and the date of filing shall be entered on the notice by the planning staff. The date of filing shall be entered on the notice by the planning staff. However, the appeal shall not be complete until all fees are paid in full.

(b) An appeal must be taken within 90 days after the date of the decision or order appealed from.

(c) Whenever an appeal is filed, the Administrator shall forthwith transmit to the Board of Zoning Adjustment all the papers constituting the record relating to the action appealed from.

(d) An appeal stays all actions by the Administrator seeking enforcement of or compliance with the order or decision appealed from, unless the Administrator certifies to the Board of Zoning Adjustment that (because of facts stated in the certificate) a stay would, in his opinion, cause imminent peril to life or property. In that case, proceedings shall not be stayed except by order of the Board of Zoning Adjustment or a court, issued

Adopted on December 14th, 2000
Effective on January 1st, 2001
Revised on 9/19/05 and 9/1/09

on application of the party seeking the stay, for due cause shown, after notice to the Administrator.

(e) The Board of Zoning Adjustment may reverse or affirm (wholly or partly) or may modify the order, requirement or decision or determination appealed from and shall make any order, requirement, decision or determination that in its opinion ought to be made in the case before it. To this end, the board shall have all the powers of the officer from whom the appeal is taken.

Section 85: Requests to be Heard Expeditiously

As provided in Section 76, the Board of Zoning Adjustment shall hear and decide all appeals, variance requests, and requests for interpretations as expeditiously as possible, consistent with the need to follow regularly established agenda procedures, provide notice in accordance with Article 3, and obtain the necessary information to make sound decisions.

Section 86: Burden of Proof in Appeals and Variances

Part A. Appeals from the Land Use Administrator

(a) When an appeal is taken to the Board of Zoning Adjustment in accordance with Section 84, the Administrator shall have the initial burden of presenting to the Board sufficient evidence and argument to justify the order or decision appealed from.

(b) The burden of presenting evidence and argument to the contrary then shifts to the appellant, who shall also have the burden of persuasion.

Part B. Variances

The burden of presenting evidence sufficient to allow the Board of Zoning Adjustment to reach the conclusions set forth in Subsection 83(b), as well as the burden of persuasion on those issues, remains with the applicant seeking the variance.

Section 87: Board of Zoning Adjustment Action on Appeals and Variances

(a) With respect to appeals, a motion to reverse, affirm, or modify the order, requirement, decision, or determination appealed from shall include, insofar as practicable, a statement of the specific reasons or findings of facts that support the motion. If a motion to reverse or modify is not made or fails to receive the four-fifths vote necessary for adoption, then a motion to uphold the decision appealed from shall be in order. This motion is adopted as the board's decision if supported by more than one-fifth of the board's membership (excluding vacant seats).

(b) Before granting a variance, the Board must take a separate vote and vote affirmatively on each of the six required findings stated in Subsection 83(b). Insofar as practicable, a motion to make an affirmative finding on each of the requirements set forth in Subsection 83(b) shall include a statement of the specific reasons or findings of fact supporting such motion

(c) A motion to deny a variance may be made on the basis that any one or more of the six criteria set forth in Subsection 83(b) are not satisfied or that the application is incomplete. Insofar as practicable, such a motion

Adopted on December 14th, 2000
Effective on January 1st, 2001
Revised on 9/19/05 and 9/1/09

shall include a statement of the specific reasons or findings of fact that support it. This motion is adopted as the Board's decision if supported by more than one-fifth of the board's membership (excluding vacant seats).

Section 88: Interpretations

(a) The Board of Zoning Adjustment is authorized to interpret the zoning map and to pass upon disputed questions of lot lines or district boundary lines and similar questions. If such questions arise in the context of an appeal from a decision of the Administrator, they shall be handled as provided in Section 84.

(b) An application for a map interpretation shall be submitted to the Board of Zoning Adjustment by filing a copy of the application with the Administrator in the planning department. The application shall contain sufficient information to enable the Board to make the necessary interpretation.

(c) Where uncertainty exists as to the boundaries of districts as shown on the Official Zoning Map, the following rules shall apply:

(1) Boundaries indicated as approximately following the centerlines of alleys, streets, highways, streams, or railroads shall be construed to follow such centerlines,

(2) Boundaries indicated as approximately following lot lines, city limits or extraterritorial boundary lines, shall be construed as following such lines, limits or boundaries,

(3) Boundaries indicated as following shorelines shall be construed to follow such shorelines, and in the event of change in the shoreline shall be construed as following such shorelines,

(4) Where a district boundary divides a lot or where distances are not specifically indicated on the Official Zoning Map, the boundary shall be determined by measurement, using the scale of the Official Zoning Map,

(5) Where any street or alley is hereafter officially vacated or abandoned, the regulations applicable to each parcel of abutting property shall apply to that portion of such street or alley added thereto by virtue of such vacation or abandonment.

(d) Interpretations of the location of floodway and floodplain boundary lines may be made by the Administrator as provided in Appendix H.

Sections 89 through 110 reserved

Adopted on December 14th, 2000
Effective on January 1st, 2001
Revised on 9/19/05 and 9/1/09