Exhibit No.:	
Issues:	*Costs Associated with Labadie Energy Center Expansion*
Witness:	*John P. Cassidy*
Sponsoring Party:	*MoPSC Staff*
Type of Exhibit:	*Rebuttal Testimony*
Case No.:	*EA-2012-0281*
Date Testimony Prepared:	*May 31, 2013*

MISSOURI PUBLIC SERVICE COMMISSION

REGULATORY REVIEW DIVISION

UTILITY SERVICES

REBUTTAL TESTIMONY

OF

JOHN P. CASSIDY

UNION ELECTRIC COMPANY,
d/b/a Ameren Missouri

CASE NO. EA-2012-0281

Jefferson City, Missouri
May 31, 2013

** **Denotes Highly Confidential Information** **

NP

REBUTTAL TESTIMONY

OF

JOHN P. CASSIDY

UNION ELECTRIC COMPANY,
d/b/a AMEREN MISSOURI

CASE NO. EA-2012-0281

Q. Please state your name and business address.

A. John P. Cassidy, 111 North 7th Street, Suite 105, St. Louis, MO 63101.

Q. By whom are you employed and in what capacity?

A. I am employed by the Missouri Public Service Commission ("Commission" or "PSC") as a Utility Regulatory Auditor V.

Q. Please describe your educational background and work experience.

A. I attended Southeast Missouri State University, receiving a Bachelor of Science degree in Business Administration, with a double major in Marketing and Accounting in 1989 and 1990, respectively. Since joining the Commission's Staff in 1990, I have assisted with and directed audits and examinations of the books and records of utility companies operating within the state of Missouri.

Q. Have you previously filed testimony before this Commission?

A. Yes, I have. Please refer to Schedule 1 to this rebuttal testimony, for a list of cases in which I have previously filed testimony as well as the issues that I have addressed in testimony.

Q. What knowledge, skills, experience, training and education do you have in the areas about which you are testifying as an expert witness?

A. I have been employed by this Commission as a Utility Regulatory Auditor for over twenty-two years and have submitted testimony on ratemaking issues numerous times before the Commission. I have also been responsible for the supervision of other Commission employees in rate cases and other regulatory proceedings. Since the time I began my employment with the Commission, I have received continuous training with regard to technical ratemaking matters both in-house and through attending National Association of Regulatory Utility Commissioners ("NARUC") sponsored regulatory seminars as well as other regulatory symposiums and conferences.

Q. Have you participated in the Commission Staff's review of Union Electric Company, d/b/a Ameren Missouri's ("Ameren Missouri" or "Company") application for permission, approval, and a certificate of public convenience and necessity ("CCN") to expand the boundaries of its Labadie Energy Center so that it can construct and operate a utility waste landfill ("UWL") and conduct other plant related operations at the site?

A. Yes, I have, in conjunction with other members of the Staff.

Q. Please summarize your rebuttal testimony in this proceeding.

A. I will provide a brief history regarding the Company's acquisition of property in connection with the proposed project and request for the CCN. I will also provide a summary of cost-related information provided by the Company regarding the project. Staff witness Claire M. Eubanks will address all engineering and operational related aspects of the CCN application.

Q. When did the Company acquire the property contemplated by its application for the CCN?

A. The Company acquired approximately 813 acres of land over a time period beginning in 1966 and most recently in 2009. Approximately 785 acres were acquired during the period covering 2008 through 2009. Currently, a portion of the land is being rented to farmers pending construction of the utility waste landfill. In addition, the land has a pipeline easement and a transmission line on it. All 813 acres are contiguous and adjoin the current certificated area for the Labadie Energy Center.

Q. How much did the Company pay for the 813 acres of land that was obtained?

A. In total, the Company paid approximately $6,862,468 for the entire tract of land.

Q. How has the Company accounted for this purchase of land in its property records?

A. In the Company's initial response to Staff Data Request No. 1 in this case, the Company indicated that it had recorded approximately $6.8 million of land costs in Uniform System of Accounts ("USOA") account 310, Land and Land Rights. However, the Company provided a supplemental response to Staff Data Request No. 1 that indicated it corrected this mistake on its books and that now the land is properly recorded in USOA account 105, Electric Plant Held for Future Use. The Electric Plant Held for Future Use account is used to record costs associated with the purchase of assets that are not currently used in the provision of electric service, but which are expected to be so used at a later time. In addition, of the approximate $6.8 million total costs of the land, approximately $12,530 relates to a pipeline easement that is recorded in USOA account 310, Land and Land Rights, and approximately $4,594 relates to a transmission line that is recorded in USOA account 350, Land and Land Rights. Please refer to Schedule 2 to this rebuttal testimony for a complete

copy of the Company's response and supplemental response to Staff Data Request No. 1 as part of this case.

Q. Of the 813 acres, how many acres are planned for use for the proposed utility waste landfill?

A. The Company has indicated to Staff that approximately 167 acres are required for construction of a four cell UWL system. The remaining 646 acres will be used to place a berm around the four cell system in addition to a number of groundwater monitoring wells that will be used for purposes of detecting any potential leakage from the UWL system.

Q. Has the Company examined the costs associated with its proposed construction of an additional landfill to dispose of coal combustion residuals ("CCR's") on land adjacent to the current land occupied by the Labadie Energy Center in comparison with other waste disposal options?

A. Yes. Ameren Missouri indicated to Staff in response to Staff Data Request No. 2 that it had engaged the services of Reitz & Jens Consulting Engineers ("R&J") while in the planning stages of the Labadie Energy Center UWL project to review alternatives for disposal of CCR's produced at the Labadie Energy Center. R&J completed a study for Ameren Missouri which examined 22 possible sites across the region. In summary, the R&J study showed that estimated disposal cost for an Ameren Missouri owned and operated UWL located adjacent to the Labadie Energy Center would be between $5.40 to $8.00 per ton, in comparison to disposal costs at a third party landfill of between $15.87 to $43.82 per ton. Therefore, according to the R&J study, the proposed Ameren Missouri owned UWL located adjacent to the Labadie Energy Center represents the lowest cost option for a UWL that is available to Ameren Missouri at this time. For a summary of the studies and analysis that

the Company provided in response to Staff Data Request No. 2, please refer to Schedule 3 to this rebuttal testimony.

Q. Does the Staff believe that the UWL is economically feasible?

A. Yes. Ameren Missouri has provided analysis and cost studies to Staff that indicates that the Company has sufficiently evaluated the necessary capital costs and ongoing operating costs associated with the proposed project. This analysis substantiates that the project is economically feasible for Ameren Missouri.

Q. Does the Staff believe that Ameren Missouri has the financial ability to construct, operate and maintain the proposed UWL?

A. Yes. The cost estimates associated with this project are relatively small in scale when compared to some other construction projects that Ameren Missouri has successfully completed during the past few years.

Q. Does this conclude your rebuttal testimony in this proceeding?

A. Yes, it does.

BEFORE THE PUBLIC SERVICE COMMISSION

OF THE STATE OF MISSOURI

In the Matter of the Application of Union Electric Company d/b/a Ameren Missouri for Permission and Approval and a Certificate of Public Convenience and Necessity Authorizing it to Construct, Install, Own, Operate, Maintain and Otherwise Control and Manage A Utility Waste Landfill and Related Facilities at its Labadie Energy Center	))))))))	Case No. EA-2012-0281

AFFIDAVIT OF JOHN P. CASSIDY

STATE OF MISSOURI)
) ss.
COUNTY OF COLE)

John P. Cassidy, of lawful age, on his oath states: that he has participated in the preparation of the foregoing Rebuttal Testimony in question and answer form, consisting of 5 pages to be presented in the above case; that the answers in the foregoing Rebuttal Testimony were given by him; that he has knowledge of the matters set forth in such answers; and that such matters are true and correct to the best of his knowledge and belief.

John P. Cassidy

Subscribed and sworn to before me this 31st day of May, 2013.

D. SUZIE MANKIN
Notary Public - Notary Seal
State of Missouri
Commissioned for Cole County
My Commission Expires: December 12, 2016
Commission Number: 12412070

Notary Public

JOHN P. CASSIDY

EDUCATIONAL AND EMPLOYMENT BACKGROUND AND CREDENTIALS

Position

I am a Utility Regulatory Auditor V in the Auditing Unit, Utility Services Department. My business address is 111 North Seventh Street, Suite 105, St. Louis, Missouri 63101. Since joining the Missouri Public Service Commission's Auditing Department Staff in 1990, I have assisted with and directed audits and examinations of the books and records of utility companies operating within the State of Missouri. I have also conducted numerous audits of small water and sewer companies in conjunction with the Commission's informal rate proceedings. Please refer to the following pages of this schedule for a list of rate case proceedings in which I have previously filed testimony.

Education

Southeast Missouri State University
Cape Girardeau, Missouri
Bachelor of Science Degree in Business Administration
Double Major: Marketing 1989 and Accounting 1990

RATE CASE PROCEEDING PARTICIPATION

JOHN P. CASSIDY

COMPANY	CASE NO.
Missouri Cities Water Company	**WR-91-172**

Payroll and Related
Pensions
OPEBS
Insurance Expense
Advertising Expense
Miscellaneous Expenses

Type of Testimony Filed: Direct and Surrebuttal

St. Louis County Water Company	**WR-91-361**

Tank Painting
Main Failures
Residue Removal
General Insurance Expense
PSC Assessment
Miscellaneous Expenses

Type of Testimony Filed: Direct

Southwestern Bell Telephone Company	**TC-93-224**

Advertising Expenses
Promotional Giveaways
Miscellaneous Expenses

Type of Testimony Filed: Direct and Surrebuttal

Laclede Gas Company	**GR-94-220**

Payroll and Payroll Taxes
Incentive Compensation
401 (K)
Dental and Vision Insurance
Data Processing

Type of Testimony Filed: Direct

COMPANY	CASE NO.
The Empire District Electric Company	**ER-95-279**
Revenues Uncollectibles Expense Municipal Franchise Taxes Postage Expense Emission Credits	
Type of Testimony Filed: Direct	
Imperial Utility Corporation	**SC-96-247**
Rate Base Depreciation Reserve Depreciation Expense CIAC Property Taxes Property Insurance Lab Testing Expense Sludge Removal Expense	
Type of Testimony Filed: Rebuttal	
St. Louis County Water Company	**WR-97-382**
Payroll and Payroll Taxes Employee Benefits Employee Savings Shared Employees	
Type of Testimony Filed: Direct	
Laclede Gas Company	**GR-98-374**
Payroll and Payroll Taxes 401 (K) Health Care Costs Pension Plan Director's Pension Plan Trustee Fees SERP Outside Consulting Incentive Compensation Advertising Expense	
Type of Testimony Filed: Direct	

COMPANY	CASE NO.
United Water Missouri, Inc.	**WR-99-326**
Payroll and Payroll Taxes 401 (K) Health Care Costs Employee Relocation Corporation Franchise Tax Advertising Expense Dues and Donations Miscellaneous Expenses Type of Testimony Filed: Direct	
Union Electric Company	**EC-2000-795**
Injuries and Damages Legal Expense Environmental Expense Type of Testimony Filed: Direct	
Union Electric Company	**GR-2000-512**
Revenues Uncollectibles Expense Customer Deposits Type of Testimony Filed: Direct	
Laclede Gas Company	**GR-2001-629**
Revenues Gross Receipts Tax Gas Supply Incentive Plan Gas Costs Uncollectibles Expense Non-Utility Operations Type of Testimony Filed: Direct	

COMPANY	CASE NO.
Union Electric Company, d/b/a AmerenUE	**EC-2002-01**

Fuel Expense
Callaway Refueling
Legal Expense
Environmental Expense
Capacity Purchases
Midwest ISO
Payroll and Related
Incremental Overtime

Type of Testimony Filed: Direct and Surrebuttal

Union Electric Company, d/b/a AmerenUE	**EC-2002-1025**

Legal Expense
Environmental Expense
Midwest ISO

Type of Testimony Filed: Direct

Laclede Gas Company	**GR-2002-356**

Revenues
Gross Receipts Tax
Gas Supply Incentive Plan
Gas Costs
Uncollectibles Expense
Income Taxes

Type of Testimony Filed: Direct

Laclede Gas Company	**GT-2003-0117**

Financial Aspects

Type of Testimony Filed: Direct

COMPANY	CASE NO.
Missouri-American Water Company	**WR-2003-0500 & WC-2004-0168**

Allocation of Belleville Labs Cost to MAWC
National Call Center
Compensation for Services Provided from MAWC to AWR
Information Technology Services
Capitalization of Shared Services
Transition Costs
Cost Allocation Manual
Affiliate Transactions
Severance Costs
National Call Center Transition Costs
National Shared Services Transition Costs

Type of Testimony Filed: Direct & Surrebuttal

Missouri-American Water Company **SM-2004-0275**

Acquisition Adjustment

Type of Testimony Filed: Direct

The Empire District Electric Company **ER-2004-0572**

Interim Energy Charge
Fuel Expense
Purchased Power
Off System Sales
KCPL Transmission Expense
Income Taxes

Type of Testimony Filed: Direct & Surrebuttal

Union Electric Company d/b/a AmerenUE **GR-2007-0003**

Environmental Expense

Type of Testimony Filed: Direct

COMPANY	CASE NO.
Union Electric Company d/b/a AmerenUE	**ER-2007-0002**

Fuel Expense
Fuel Inventories
Callaway Refueling Costs
Combustion Turbine Maintenance Expense
Environmental Expense
Gains on the Sale of Sulfur Dioxide Emission Allowances

Type of Testimony Filed: Direct, Rebuttal and Surrebuttal

Missouri-American Water Company	**WR-2007-0216**

Belleville Labs Allocation
Compensation for Services MAWC Provided to AWR
Income Taxes

Type of Testimony Filed: Direct

Union Electric Company d/b/a AmerenUE	**ER-2008-0318**

Fuel and Purchased Power Expense
Off System Sales
Fuel Inventories
Callaway Refueling Costs
Generating Plant Outages
Capacity Charges
Entergy Refunds
Non-Labor Storm Costs – Test Year
Non-Labor Storm Cost AAO
Non-Labor Storm Cost Amortization
SO2 Emission Allowance Sales and Tracker
Deferred Income Taxes for Rate Base
Income Taxes
Production Cost Model Issues

Type of Testimony Filed: Direct and Surrebuttal

COMPANY	CASE NO.
Union Electric Company d/b/a AmerenUE	**ER-2010-0036**

Corporate Allocations
Potential Refundable Entergy Charges
Payroll and Payroll Taxes
Employee Benefits
Voluntary Separation Election
Involuntary Separation Program
Severance Costs
Callaway Security Force

Type of Testimony Filed: Direct

Laclede Gas Company	**GR-2010-0171**

Report on Revenue Requirement Cost of Service
Overview of Staff's Filing
Revenue Associated with Propane Sale
Insulation Financing
Energy Wise
NITEC Study
Home Sales Reinspection Fees
Gain on Sale of Property
Emergency Cold Weather Rule AAO
IFRS AAO
Gas Safety AAOs
Line of Credit Fees

Type of Testimony Filed: Direct, Rebuttal and Surrebuttal

Union Electric Company d/b/a AmerenUE	**ER-2011-0028**

Accumulated Deferred Income Taxes
Potential Refundable Entergy Charges
Payroll
Payroll Taxes
Voluntary Separation Election Plan
Involuntary Separation Program
Test Year Severance Costs
Amortization of Severance Costs
Other Employee Benefits
Test Year Storm Costs
Storm Cost AAO Case Nos. EU-2008-0141 and ER-2008-0318
Rebranding Costs
Income Tax

Type of Testimony Filed: Direct and Surrebuttal

COMPANY	CASE NO.
Union Electric Company d/b/a AmerenUE	**ER-2012-0166**

Report on Revenue Requirement Cost of Service
Overview of Staff's Filing
Plant-in-Service Accounting
Accumulated Deferred Income Taxes
Employee Stock Ownership Plan Deduction
Income Taxes
Missouri Jurisdictional Allocation Factors
Lake of the Ozarks Shoreline Management Program
Storm Assistance Revenues and Expenses
Renewable Energy Standard Costs

Type of Testimony Filed: Direct, Rebuttal and Surrebuttal

AmerenUE
Response to MPSC Data Request
MPSC Case No. EA-2012-0281
Certificate for Public Convenience and Necessity to Construct Landfill

Data Request No.: MPSC 0001 - John Cassidy

1. On what date(s) did Ameren Missouri acquire approximately 813 acres of land that it proposes to use for construction of a utility waste landfill near Labadie? Also, identify each party that Ameren Missouri purchased the land from and indicate the amount of land acquired from each party. 2. Quantify all amount(s) Ameren Missouri paid for approximately 813 acres of land by party and 3. (a) Provide the journal entries Ameren Missouri used to record the purchase of the 813 acres of land on its books and records. (b) Identify all amounts by FERC accounts and indicate if the costs associated with the land are recorded in plant held for future use, below the line or if it is already in service above the line (c) If the land is in service above the line, describe in detail what the land is currently used for. (d) Quantify all amounts of ongoing costs (maintenance, upkeep, property taxes, insurance etc...) associated with the 813 acres of land that were recorded during the twelve months ending December 31, 2012.

RESPONSE

Prepared By: Laura Moore
Title: Managing Supervisor, Regulatory Accounting
Date: February 26, 2013

1. See attached file MPSC 0001 Landfill Land.
2. See attached file MPSC 0001 Landfill Land.

3a. The entry to record the purchase of the land was as follows:

Account	Transaction Type	Description		
310	2	Steam - Land and Land Rights	$6,857,874	
350	2	Transmission - Land and Land Rights	4,594	
310	1	Steam - Land and Land Rights		6,857,874
350	1	Transmission - Land and Land Rights		4,594

The transaction types in the above entry are as follows: 1 = CWIP Transfer to Plant In Service and 2 = In Service Addition.

3b. The land is recorded above the line in FERC accounts 310 and 350.
3c. A portion of the land is being rented to farmers pending construction of the utility waste landfill. There is also a small piece with an transmission line on it.
3d. Real estate taxes paid in 2012 based on the 2011 tax bill were $5,690.

Ameren Missouri
MPSC 0001
Labadie Landfill Land

Date Land Acquired	Date Placed in Service	Qty	Cost	FERC Account	Business Division	long_description	Work Order	Short Description
11/29/2007	3/1/2009	1.70	7,264	310	58 - Labadie	Brunjes Property - Pt of the SW1/4 of Sec. 8, T44N, R2E of the 5th PM, Franklin CO., MO	20282	BRUNJES
11/29/2007	3/1/2009	-	4,822	310	58 - Labadie	Land-Fee-Acquisition Cost- Winston & Mary Brunjes	20282	BRUNJES
12/20/2007	3/1/2009	128.90	1,108,035	310	58 - Labadie	Heisel Property -Pt of SW1/4 of Sec. 8 & pt of the W1/2 of Sec. 17, T44N, R2E 5th PM.	20282	HEISEL
12/20/2007	3/1/2009	-	343	310	58 - Labadie	Land-Fee-Acquisition Cost-Edward & Marilyn Heisel	20282	HEISEL
2/13/2009	3/1/2009	200.90	1,743,121	310	58 - Labadie	M & J Newman - Pt of Sec. 8 & 17 & Pt of U.S. Survey 98 in T44N, R2E of the 5th PM (Tax Parcel Id # 08-3-080-0-000-007000; 08-4-170-0-000-002000; 08-4-200-0-000-006000)	20282	M & J NEWMAN
2/13/2009	3/1/2009	-	356	310	58 - Labadie	Land-Fee-Acquisition Cost - Marvin & Judith Newman	20282	NEWMAN
2/27/2009	3/1/2009	277.50	2,407,506	310	58 - Labadie	Newman/Eckelkamp Property - Part of Lots 1 through 8 of "Worthington Heirs Subdivision" in Franklin CO., MO being Pt of Sec 8, 9, 16 & 17 and Pt of U.S.Survey 98 in T44N, R2E, 5th PM TAx Parcel ID #08-4-17.0-0-001-006.000; 08-5-16.0-0-001-005.000;	20282	NEWMAN-ECKELK
2/13/2008	3/1/2009	-	327	310	58 - Labadie	Land-Fee-Acquisition Cost - POWELL'S POINT LLC FORMERLY MARGUERITE DREWEL	20282	POWELL'S POINT
2/13/2008	3/1/2009	176.30	1,562,970	310	58 - Labadie	Powell's Point LLC Property- Pt of SW1/4 of Sec. 8 & Pt of the W1/2 of Sec. 17, all in T44N, R2E of the 5th PM and being the same tract of land as in Tract 1 conveyed to the Emmet H. Orewel Revocable Living Trust, in Franklin CO., MO	20282	POWELL'S POINT
	3/1/2009	-	10,407	310	58 - Labadie	2994::Land-Fee-Acquisition Cost	20282	
	3/1/2009	-	193	310	58 - Labadie	SERVICE REQUEST- BAR8 SKITT	20282	
9/30/1966	12/31/1970	-	938	310	58 - Labadie	ACQUISITION COST, TOWNSHIP 44N, RANGE 2 E, LOT 4, MILES HINKLE ESTATE SU8D. CASEY & SMOOT. ACREAGE: 60.95.	04545	
12/31/1971	12/31/1971	-	(942)	310	58 - Labadie	FEE LAND, EASEMENT FOR PIPELINE; TOWNSHIP 44 N, RANGE 2 E, LOT 4, MILES HINKLE ESTATE SUBD. PURCHASEO FROM CASEY & SMOOT. ACREAGE: 60.96.	07366	
9/30/1966	12/31/1970	20.80	12,534	310	58 - Labadie	FEE LAND, TOWNSHIP 44 N, RANGE 2 E, LOT 4, MILES HINKLE ESTATE SU80. PURCHASED FROM CASEY & SMOOT. ACREAGE: 60.96.	04545	
					22 - Missouri	A TRACT OF LAND KNOWN AS PART OF LOT 4 OF SU8D. OF MILES HINKLE ESTATE IN		
9/30/1966	12/31/1971	7.00	4,594	350	Transmission	T44N,R2E,FRANKLIN CO. MO.,PURCHASED FORM E. CASEY AND E. AND J. SMOOT W/OIMENSIONS 7558.4'/7800.0'X410.0'/513.8',PURCHASE PRICE $42,036.00	8000	
		813.10	6,862,468					

Schedule 2 (Page 2 of 3)

Schedule 2 (Page 2 of 3)

AmerenUE
Response to MPSC Data Request
MPSC Case No. EA-2012-0281
Certificate for Public Convenience and Necessity to Construct Landfill

Data Request No.: MPSC 0001s1 - John Cassidy

1. On what date(s) did Ameren Missouri acquire approximately 813 acres of land that it proposes to use for construction of a utility waste landfill near Labadie? Also, identify each party that Ameren Missouri purchased the land from and indicate the amount of land acquired from each party. 2. Quantify all amount(s) Ameren Missouri paid for approximately 813 acres of land by party and 3. (a) Provide the journal entries Ameren Missouri used to record the purchase of the 813 acres of land on its books and records. (b) Identify all amounts by FERC accounts and indicate if the costs associated with the land are recorded in plant held for future use, below the line or if it is already in service above the line (c) If the land is in service above the line, describe in detail what the land is currently used for. (d) Quantify all amounts of ongoing costs (maintenance, upkeep, property taxes, insurance etc...) associated with the 813 acres of land that were recorded during the twelve months ending December 31, 2012.

RESPONSE

Prepared By: Laura Moore
Title: Managing Supervisor, Regulatory Accounting
Date: April 17, 2013

Supplemental Response No. 1:

3.(b) As of March 2013, the land was recorded in the following accounts:

Account	Amount
105	$6,845,344
310	$ 12,530
350	$ 4,594

The land in account 310 is related to a pipeline easement. The land in account 350 has a transmission line on it.

AmerenUE
Response to MPSC Data Request
MPSC Case No. EA-2012-0281
Certificate for Public Convenience and Necessity to Construct Landfill

Data Request No.: MPSC 0002 - John Cassidy

1. Is the construction of a company owned landfill on land adjacent to the current land occupied by the Labadie Energy Center the lowest cost option available to Ameren Missouri? Please explain. 2. Provide a copy of all supporting documentation Ameren Missouri relied upon to determine that "the best option which minimized cost as well as environmental and land use impacts was a construction of a Company owned landfill on land adjacent to the current land occupied by the Labadie Energy Center." Include all studies that have been performed.

RESPONSE

Prepared By: Craig J. Giesmann
Title: Managing Supervisor, Hydro Engineering
Date: February 26, 2013

1. Yes. While in the planning stages of the Labadie Landfill UWL project, Ameren Missouri engaged the services of a consultant – Reitz & Jens Consulting Engineers (R&J) – to review alternatives for Coal Combustion Products (CCP's) at the Labadie Energy Center (as well as for Ameren Missouri's other coal fired power plants). The attached study, entitled *AmerenUE Utility Waste Landfill Feasibility Study,* provides details of the expected costs of constructing and operating a Utility Waste Landfill (UWL). Additionally, Ameren Missouri engineers reviewed existing third party licensed landfills for potential disposal of CCP's. The attached spreadsheet (filename: commercial landfill costs.xls) was developed and provided approximate costs for CP disposal and transportation at various third party landfills. Documentation was also received from Fred Weber, Inc. (local contractor who owned and operated landfills at that time) that further demonstrated the approximate disposal costs for Labadie CCP's. (See attached Fred Weber email correspondence.) In summary, the R&J study showed estimated disposal costs for a Company owned and operated UWL adjacent to the Labadie Energy Center of between $5.40 - $8.00 per ton, as compared to disposal costs at a third party landfill of between $15.87 - $43.82 per ton.

2. It should be noted that Ameren Missouri did not review CCP disposal options for the Labadie Energy Center alone, but rather, took a holistic review of the disposal needs of all of the Ameren Missouri coal fired power plants. As such and as demonstrated in the attached report, various options were reviewed for each plant and options were also reviewed for a regional landfill that would service multiple plants. Ultimately, the requirements of the Franklin County Land Use Ordinance contemplated only a local landfill for the Labadie Plant alone. The attached PowerPoint slides and site review matrix provide details of sites that were reviewed.

AmerenUE
UTILITY WASTE LANDFILL FEASIBILITY STUDY
Revised June 8, 2004

OVERVIEW

Union Electric Company's Labadie, Rush Island, Meramec and Sioux Power Plants are projected to annually produce approximately 1,325,000 tons of coal combustion ash over the next 20 years. This ash includes flyash, scrubber sludge, and bottom ash at the rates indicated in Table A. For the purpose of this study the ash was assumed to have an average dry density of 60 lbs/cubic-foot when placed in a conventional manner.

Reitz & Jens, Inc. was engaged by AmerenUE, under Task #49 of our open-ended Engineering Services Agreement Contract, to evaluate the feasibility of developing utility waste landfills (UWL) for disposal of this ash. This study briefly discusses some of the criteria that must be considered in siting, permitting, building, operating and closing UWLs, but concentrates on budgetary costs for landfilling the ash in separate landfills for each power plant, as well as a single UWL to accept wastes from all four power plants.

REGULATIONS

Utility Waste Landfills (UWL) are regulated by the Missouri Department of Natural Resources (MDNR) under rules promulgated in 10 CSR 80, Chapter 11. A copy of these rules is included in Appendix B.

The rules establish many requirements for siting, design, operation, and closure of UWLs. Some of the rules that will impact new AmerenUE landfills include:

General

- Sluicing waste into a landfill may be allowed provided the hydraulic head on top of liner is less than 1 foot;
- Access to a UWL must be controlled, on access roads only, and only when operating personnel are on duty;
- The waste must be compacted to smallest practicable volume;
- The maximum groundwater elevation must be determined, and a separation from lowest point of lowest cell must be shown on plans;
- Plans must include an effective dust control program;

Siting Restrictions

- A UWL in 100-year floodplain shall not restrict the floodplain conveyance or storage;
- A UWL shall not be located in wetland without proper Corps of Engineers permits;
- A UWL shall not be located within 200 feet of a Holocene fault in a seismic impact zone;
- A stability analysis proving that the UWL is stable, must be performed for UWLs proposed for unstable areas;

Liner Construction

- If base of the UWL liner is in contact with groundwater, the applicant must demonstrate that groundwater will not adversely impact liner;
- The detailed Site Investigation will determine if as secondary liner (a geomembrane and/or leachate collection system) is mandatory;
- A composite or clay bottom liner is required. The clay liner must include at least 2 feet of compacted clay with a permeability of less than $1x10^{-7}$ cm/sec. The composite liner must include at least 2 feet of compacted clay with a permeability less than $1x10^{-5}$ cm/sec and a 60 mil HDPE liner;

Leachate Collection

- A leachate collection system is required unless demonstrated to MDNR by the results of the detailed Site Investigation that it is not necessary;
- The leachate collection system design shall maintain less than 1-foot of leachate over the bottom liner;
- The leachate collection system shall be operated for the 20-year post closure period, or as long as MDNR determines is necessary;

Interim/Final Cover

- Wastes that are easily moved by wind (i.e. flyash) shall be covered as necessary to prevent becoming airborne;
- Mining in the landfill to remove wastes for beneficial reuse is allowed;
- Cover shall be applied to minimize infiltration of precipitation, airborne waste, and provide a pleasing appearance;
- Final side slopes shall not exceed 25% (4:1) without a detailed slope stability and erosion analysis;
- A 1-foot thick compacted soil cover shall be applied on fill areas that are idle for more than 60 days and on final side slopes at the end of each filling sequence;
- Active and intermediate slopes shall not exceed 33% (3:1);
- Final cover shall include 1-foot of $1x10^{-5}$ clay (CH,CL,ML,SC or MH) over 1-foot of soil capable of sustaining vegetative growth (topsoil);

Groundwater Monitoring

- The owner/operator of a UWL must implement a groundwater monitoring program capable of determining the landfill's impact on the quality of groundwater underlying the UWL;
- Groundwater monitoring requirements will be based on groundwater elevation, quantity and flow, geology, adjacent land use, nearby wells, etc.;
- Minimum number of wells shall be 1-upgradient, and 3-downgradient of UWL;
- A minimum of 4 quarterly samples per well shall be used to develop a baseline/background groundwater quality;

- Minimum annual detection monitoring shall analyze samples from each well in May and November;
- Analysis shall be for 32 parameters outlined in Appendix I;

Gas Monitoring

- Gas monitoring is not required;

Closure/Financial Assurance

- The leachate collection system shall be operated for the 20-year post closure period;
- Closure and post closure care shall be in accordance with 10CSR80-2.030(4)(A);
- Each UWL application shall include a closure plan and 20-year post-closure plan;

SITING ALTERNATIVES

The location of a new UWL must be approved both by the MDNR and the local entity have jurisdiction over land use.

MDNR primarily considers whether a proposed UWL site is suitable for use as a landfill based on the site's geology, topography, and the potential impacts of the landfill on the geology and water resources of surrounding areas. The MDNR follows the methodologies prescribed in 10 CSR 80 to determine whether to approve a UWL on a specific site.

City and/or County Planning Departments are usually responsible for approving the land use aspects of UWLs. In areas with formal zoning regulations, landfills are rarely a permitted use, and must be approved by the Conditional Use Permitting (CUP) process. The CUP process includes at least one public hearing, as well as formal approval by both local Planning & Zoning Boards, and City Councils.

Given the amount of public evaluation and input required in approving a new UWL, it is extremely important to anticipate the public's reaction when siting the landfill. With the exception of sites in karst areas, fault zones, or floodplains, engineering solutions can usually be developed to address the issues raised by MDNR. Land use issues are more problematic to resolve.

Recent history in the St. Louis region has shown an increased awareness and willingness to fight those land uses that are considered to be a public nuisance. Unfortunately, a Utility Waste Landfill, while necessary, is perceived by most as a public nuisance.

Often, the best location to site a new public nuisance is next to an existing nuisance. In the case of a UWL, the best siting location is probably adjacent to the power plant that is generating the

waste (ash) that will be disposed of in the landfill. Siting the UWLs near the plants will also minimize transportation costs which is typically the single most expensive aspect of ash disposal.

If suitable UWL sites are not available near the plant, the next best alternative is siting the UWL near another public nuisance such as another landfill, heavy industrialized areas, or abandoned quarries. Abandoned quarries are also desirable because their geometry allows for efficient disposal of the ash.

A third alternative, although one that is becoming increasingly difficult, is to site the UWL as far away from developed areas as possible. Locating the UWL in an undeveloped area should minimize the public nuisance aspects, but may create other environmental impacts, and will increase transportation costs.

Potential UWL sites must be evaluated individually to weigh the pros and cons of each site. Land use considerations, and CUP possibilities are best evaluated by a Real-estate professional. Site specific design criteria are best evaluated by Professional Engineers and Geologists experienced in landfill design.

LANDFILL CONSTRUCTION

The construction alternatives for a utility waste landfill falls into one of three categories based on the geology and topography of the available sites. Generally, a landfill can be developed by:

1) Filling an abandoned pit quarry or other large excavation,
2) Mounding wastes above natural grades, and
3) Filling a valley or other natural feature

Typically, creating a landfill in an abandoned pit quarry will be the most cost effective because a quarry's near vertical walled geometry creates the highest ratio of air space to landfill liner. Mounding wastes is the next most efficient since the regulations require side slopes on all above grade fills to be 4:1. The geometry of a typical valley in eastern Missouri creates a relatively low air space to liner ratio, making this the most costly alternative per CY of utility waste disposed. In this study we estimated the preliminary costs of pit quarry and above ground UWLs only.

Landfills are usually constructed in cells. The cell construction allows for the landfill to be phased so that only a portion of the overall landfill site is active at any one time. Depending on the site geometry, UWLs can usually be permitted so that individual cells can be permanently closed as filling in that cell is completed. This allows the Post Closure period of the cell to begin well before the entire landfill site is closed.

The regulations state that at least 1 foot of compacted soil is placed on all areas of the UWL that are idle for more than 60 days. The purpose of this interim cover is to minimize infiltration of precipitation, and airborne wastes, and to provide a pleasing appearance. Interim cover also increases the amount of landfill airspace needed and the required quantity of suitable cover materials. Given the cementitious nature of the ash wastes, it is our opinion that MDNR can be

convinced that interim cover will not be needed for UWLs taking only coal combustion ash wastes. Interim cover requirements were not included in our UWL cost estimates.

Each landfill site will have unique geologic and topographic features that will determine the final required geometry and scope of landfill improvements. For the purposes of this study, idealized landfill geometries were used to develop the landfill development cost estimates.

ABANDONED PIT QUARRY

Abandoned pit quarries provide the most efficient geometry for a landfill since the near vertical walls will provide the most amount of air space (landfill volume) per square foot of landfill bottom liner. The negatives of a pit quarry UWL development include an increase in the sidewall liner thickness, the limited amount of adequate soil for use in the landfill construction and operation, potential increases in the groundwater/leachate control requirements, and the limited number of available sites, as well as the fixed geometry of these existing sites.

For this study, we assumed that the pit quarry UWL would have a square footprint and that the ash would be landfilled to a depth of 150 feet. Furthermore, we assumed that the landfill bottom liner would include a 2 feet of compacted clay beneath a 1 foot thick drainage blanket, a 10 foot thick sidewall liner on all four sides, and a soil cap consisting of 1 foot of compacted clay beneath 1 foot of soil suitable for maintaining vegetation. The base cost estimate assumed that all soils were available from the landfill site, and that synthetic (HDPE) bottom and side liners would not be needed. Potential cost additions include the need to import (truck) soils into the site, and the addition of a synthetic bottom liner.

ABOVE GRADE

The primary advantage of and Above Grade landfill is that it can be sited virtually anywhere a relatively flat site is available. The second advantage is that excavation during development of this type of landfill can often generate the soils needed during landfill operations and closing, provided the landfill is sited in an area with a predominantly clay soil mantle. In most cases, construction of an above grade landfill will generate excess cut that is a resource that can be used to fill off-site locations. The geometry of above grade UWLs are less efficient than pit quarries because the regulations require these landfills to be constructed with 4:1 side slopes above grade. Steeper side slopes may be approved by MDNR but only after extensive slope stability analysis. Above grade UWLs will generally require more than twice the land of a pit quarry landfill with the same capacity.

For this study, we assumed that the above grade UWL would have a square footprint and that the ash would be landfilled to 100 feet above surrounding grades. The landfill would be constructed by excavating 10 feet below grade, installing the 2 foot thick compacted clay bottom liner and1-foot thick drainage blanket and then placing the landfill material. The below grade slopes in the excavated portion of the landfill would be 3:1, while the fill slopes above grade would be 4:1. As landfill cells are completed, the area will be capped with 1 foot of compacted clay beneath 1 foot of soil suitable for maintaining vegetation. The base cost estimate assumed that all soils were

available from the landfill site, and that a synthetic (HDPE) bottom liner would not be needed. The primary potential cost addition considered in our analysis was the addition of a synthetic bottom liner.

COST ESTIMATES

The costs associated with disposal of ash in a Utility Waste Landfill fall into four main categories: transportation costs, landfill development costs, landfill operation costs and landfill closure costs.

Transportation Cost

Four possible modes of transportation are available for transporting ash from the power plants to a UWL: conveyor, truck, rail and barge. Conveyor transport is only feasible if the UWL is located adjacent to the power plant. Truck transport is generally the least costly alternative for short hauls, while rail and truck may be viable for longer hauls provided the UWLs are located near existing rail lines or major rivers. Substantial infrastructure costs are needed to handle the materials at both the power plant and UWL if the conveyor, rail or barge options are chosen. While trucking will create higher per mile costs, little to no material handling infrastructure is needed for this option.

AmerenUE estimates that it will cost approximately $3 per ton to collect and transport the ash to an off-site landfill location for disposal, provided the landfill site is within 10 miles of the power plant. They estimate that these transportation costs will increase to $4.50 per ton for a landfill between 10 and 20 miles from the generation source. Similar increases can be expected as the landfill sites are moved further away from the ash generation site (power plant). Higher transportation unit prices should also be expected in highly developed, congested areas.

UWL Development Costs

The costs to develop a landfill site include the property purchase cost, landfill development cost, and professional services costs to design and permit the UWL. While a landfill is typically developed in cells over a period of years, our estimate assumes that the entire landfill footprint is developed simultaneously.

The estimated costs to develop both UWL types at each of the four power plants, as well as the cost to develop both types in a single location to accept ash from all four power plants are included in Appendix A. These estimates are based on unit rates in current 2004 dollars. The estimates include the costs to purchase the minimum amount of property needed for the landfill, and are based on unit price estimates provided by AmerenUE's Real-estate Department.

UWL Operating Costs

The costs to operate a UWL site include the costs to unload, place, and compact the ash materials within the landfill; costs to manage and dispose of leachate from the landfill, as well as the costs

to monitor groundwater quality outside the landfill as required by the MDNR regulations. These estimated costs assume that the landfill will be open daily and use a unit rate for each cubic yard of ash disposed. If the landfill is managed to be open only periodically when large waste shipments arrive, operating costs should be somewhat reduced.

The annual estimated UWL operating costs are based on unit rates in current 2004 dollars. Inflation costs are not included in the future operating costs. The "Cost per Ton" shown in Table B includes the present value of the annual operating costs over a period 20 years, assuming an annual interest rate of 5%.

UWL Closure Costs

The costs to close a UWL site include the costs to cap and close each site at the end of its 20 year operational life, as well as the costs to monitor and maintain the site during the 20 year post-closure period mandated by MDNR. These closure and post-closure costs are based on unit rates in current 2004 dollars. Inflation costs are not included in the closure costs. The "Cost per Ton" shown in Table B includes the present value of the post closure costs 20 years in the future, plus the closure costs, all discounted to a present cost assuming a 5% annual interest rate over the next 40 years.

Potential Cost Additions

The primary potential cost additions are the costs to import suitable clay soils for landfill liners if not available on-site, and the costs to install a synthetic bottom liner if required by MDNR. Both of these unit costs are based on 2004 dollars without inflation. The "Cost per Ton with Contingencies" in Table B includes the added cost to import soils and install a synthetic liner during original UWL development, plus the additional costs to import soils at closure, discounted to a present cost assuming a 5% annual interest rate.

Summary

The present value costs to permit, construct, operate, and close Utility Waste Landfills for each of the Ameren UE power plants are summarized in Table B. Unit costs per ton of material landfilled have been developed for both pit quarry and above grade UWLs.

While several scenarios were evaluated we would suggest four separate unit prices are used when planning a Utility Waste Landfill:

	Unit cost per ton of material landfilled	
Landfill Type	Meramec	Labadie, Rush Island & Sioux
Pit Quarry UWL using on-site soils	$3.60	$2.40-2.60
Pit Quarry UWL using imported soils	$4.50	$2.90-3.50
Above Grade UWL using on-site soils	$5.60	$2.80-3.10
Above Grade UWL using imported soils	$5.70	$2.80-3.20
Transportation to UWL within 10 miles	$3.00+	$3.00
Transportation to UWL from 10 to 20 miles	$4.50+	$4.50

The total disposal cost (trucking plus landfill cost) to dispose of the ash in a new UWL will range from $6.60 to $10.20 at the Meramec Plant, and $5.40 to $8.00 at all other plants. These costs should be used for planning purposes only, as the quantities and rates used to establish the unit prices were estimates based on 2004 dollars, and the final costs for the UWL are heavily determined by site specific conditions. The higher unit costs for the Meramec Plant were primarily due to the higher land costs and congestion in the vicinity of the plant.

Any questions regrading the content of this report should be directed to Paul H. Reitz, P.E. at Reitz & Jens, Inc.

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