Exhibit No.:	
Issue(s):	Utility Waste Landfill Issues Raised at Local Public Hearings
Witness:	Craig J. Giesmann
Sponsoring Party:	Union Electric Company
Type of Exhibit:	Surrebuttal Testimony
Case No.:	EA-2012-0281
Date Testimony Prepared:	September 13, 2013

MISSOURI PUBLIC SERVICE COMMISSION

Case No. EA-2012-0281

SURREBUTTAL TESTIMONY

OF

CRAIG J. GIESMANN

ON

BEHALF OF

UNION ELECTRIC COMPANY
d/b/a AMEREN MISSOURI

St. Louis, Missouri
September, 2013

TABLE OF CONTENTS

SURREBUTTAL TESTIMONY

OF

CRAIG J. GIESMANN

CASE NO. EA-2012-0281

I. INTRODUCTION

Q. Please state your name and business address.

A. Craig J. Giesmann, Union Electric Company Power Operation Services, 3700 South Lindbergh, Sunset Hills, Missouri 63127.

Q. What is your position with Union Electric Company d/b/a Ameren Missouri ("Ameren Missouri" or "Company")?

A. I am the Managing Supervisor of Hydro Engineering.

Q. Are you the same Craig J. Giesmann who filed direct testimony in this case on April 26, 2013?

A. Yes.

Q. What is the purpose of your surrebuttal testimony in this proceeding?

A. The purpose of my surrebuttal testimony is to address issues, questions and concerns raised during the Local Public Hearings held in Union, Missouri, on June 25, 2013, and in Washington, Missouri, on July 10, 2013, with regard to Ameren Missouri's planned new Utility Waste Landfill (UWL) at the Labadie Energy Center. The main questions raised at the public hearings that I will address are summarized as follows:

- Site suitability for the UWL;
- Siting of the UWL in a floodplain;
- Groundwater monitoring;

- Alternatives studied; and
- NPDES[1] Permit status.

Q. Are you sponsoring any schedules?

A. Yes, I am sponsoring the following schedules:

1. Aerial photo of site
2. Photo – Road Part Way Up the Bluffs to the South – Looking Northeast
3. Photo – Road Part Way Up the Bluffs to the South – Looking Northeast – UWL Superimposed
4. Photo – St. Albans Looking North
5. Photo – St. Albans Looking North – UWL Superimposed
6. Photo – From Powerhouse looking Southeast
7. Missouri Department of Natural Resources (MDNR) Regulations for UWLs
8. Preliminary Site Investigation
9. MDNR Preliminary Site Investigation Approval
10. Detailed Site Investigation
11. MDNR Detailed Site Investigation Approval
12. CDG Engineers Flood Study
13. Photo – Solid Coal Ash Cylinder
14. Franklin County Engineer's Flood Permit Approval Letter
15. Groundwater Monitoring Well Plan
16. Golder Associates Deep Well Installation Report
17. Golder Associates Deep Well Results

[1] "NPDES" stands for National Pollutant Discharge Elimination System, which is a permit required by the federal Clean Water Act, which in Missouri is administered by the Missouri Department of Natural Resources (MDNR).

18. MDNR Letter Re: Compliance with Water Law

19. Reitz & Jens Cost Study

19A. Reitz & Jens Cost Study Appendices (HC)

20. Spreadsheet Summarizing Off-Site Costs (HC)

21. PowerPoint Presentation Re: Costs/Options (HC)

22. Revenue Requirement Study Materials (HC)

23. Construction Permit Application to MDNR

Q. Are the opinions you express herein given within a reasonable degree of engineering certainty?

A. Yes, they are.

Q. To the extent you rely upon documents in forming your opinions, are those documents of the type reasonably relied upon by experts in engineering and the related disciplines with which civil engineers like yourself have expertise?

A. Yes, they are.

II. SUITABILITY OF SITE

Q. Several local public hearing witnesses questioned whether this site, which is next to the existing energy center and in the river bottoms next to the Missouri River, is a suitable site for the proposed UWL. First, can you provide some perspective on the location of the site vis-à-vis the existing plant's footprint and vis-à-vis neighbors in the area?

A. The proposed UWL site is situated right next to the existing Labadie Energy Center, just to the southeast of it. An aerial photo that shows the existing energy center and the

proposed UWL is attached[2] hereto as Schedule CJG-S1. The land is currently being utilized as agricultural fields. The closest homes are located atop the bluff towards the South of the site. Attached as Schedule CJG-S2 is a photo taken from a road leading from the fields part of the way up the bluffs to the south. The photo is looking to the northeast toward the UWL site with the energy center itself in the distance. The next photo (Schedule CJG-S3) is the same photo, but we have superimposed a drawing of the proposed UWL as built. Comparing the two photos, you can see less of the bottom of the powerhouse building at the plant in the second, which is partially obscured by the berm around the UWL. The next two photos (Schedules CJG-S4 and CJG-S5) are taken from Legacy Point in St. Albans (a community further south down the river), with the first photo showing the proposed UWL site without the UWL and the second one showing the view with the UWL superimposed on the site. I have also attached one more photo taken from the top of the powerhouse building looking at the site to the southeast (Schedule CJG-S6). You can see the existing fly ash pond in the foreground. The first cell of the UWL will be built just to the right of the tree you see on the left side of this photo.

Q. Regarding the criticisms made by local public hearing witnesses, do you have an opinion regarding the appropriateness of this site for a UWL?

A. Yes.

Q. What is your opinion?

A. The site is appropriate for locating the proposed UWL as demonstrated by the extensive geological and hydrological studies completed for the site, which have resulted in MDNR's approval of the site for construction and operation of a UWL subject to issuance of a Construction Permit from the Missouri Department of Natural Resources (MDNR). Franklin

[2] Given the number of schedules and the file sizes of many of them, when I refer to them as "attached," I mean that they are also being filed with my testimony.

County, Missouri, has also determined that it is appropriate to develop the UWL at this location, as evidenced by its issuance of a Floodplain Development Permit. Not only have these regulatory bodies with jurisdiction over the site and the proposed UWL determined the appropriateness of the site, but other experts agree that the site is appropriate from an engineering and hydrogeological perspective, as reflected in the surrebuttal testimonies of Ameren Missouri expert witnesses Tyler E. Gass (a hydrogeologist) and Steven F. Putrich, P.E. (a civil engineer and expert in the design and construction of facilities of this type).

Q. You indicated that the MDNR has approved the site. Please explain MDNR's site approval process.

A. MDNR regulations require anyone desiring to construct a solid waste landfill like the UWL to obtain geologic and hydrologic approval of the site. To obtain this approval, the applicant must submit detailed geologic and hydrologic analyses and documentation. MDNR's regulations governing this process are attached hereto as Schedule CJG-S7. As indicated in the regulations, the applicant must first submit a Preliminary Site Investigation (PSI) and if the PSI is approved, must then submit an even more comprehensive Detailed Site Investigation (DSI). In compliance with the MDNR's regulations, Ameren Missouri submitted a PSI request to the MDNR in December of 2008 seeking MDNR's preliminary approval of the site for the proposed UWL. The PSI, submitted pursuant to 10 CSR 80-2.015(1)(A), is attached hereto as Schedule CJG-S8. In February of 2009, the MDNR, through its Division of Geology and Land Survey, approved the PSI. MDNR's PSI approval is attached hereto as Schedule CJG-S9. Ameren Missouri then proceeded to prepare and submit the DSI which was submitted to MDNR in May 2009 and which is attached hereto as Schedule CJG-S10. The MDNR's Division of Geology and Land Survey completed its review of the DSI and approved it in April 2011. A copy of MDNR's approval is attached hereto as Schedule CJG-S11.

As can be readily observed from the exhaustive analyses and site characterization included in the PSI and the DSI included as Schedules to my testimony, engineering, geological and hydrological studies have been completed, submitted to MDNR, and reviewed by MDNR. Based on these submittals, MDNR determined that the site is suitable for the construction and operation of the proposed UWL. MDNR made this determination because the geological and hydrological conditions at the site make it appropriate for construction and operation of the UWL. Mr. Putrich also addresses the MDNR regulations and the MDNR permitting process in detail in his surrebuttal testimony.

Q. At least one local public hearing witness claimed that "obviously" the UWL could not be built in the floodplain. Do you agree?

A. No, I do not.

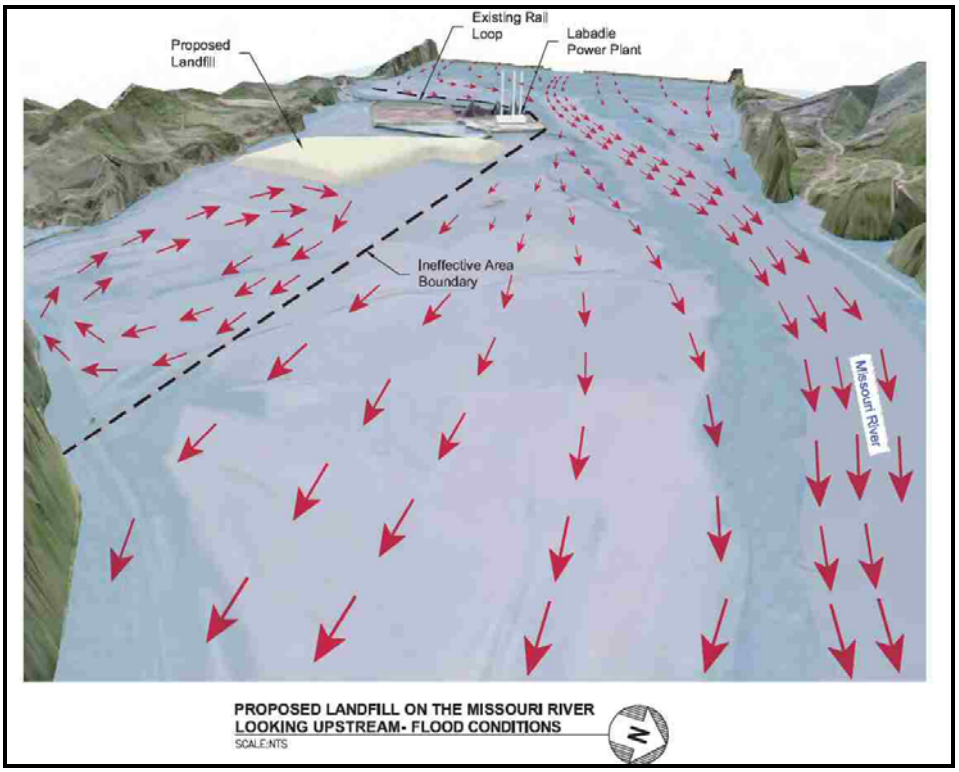
Q. Why not?

A. MDNR's regulations (as well as Franklin County's zoning ordinances) specifically contemplate that a UWL can be built in a floodplain. Consequently, it is "obvious" that a UWL can be built in a floodplain, just as it is obvious that power plants can be built (and have been built) in floodplains. In order to satisfy MDNR regulations for construction of a UWL within the floodplain, Ameren Missouri had to demonstrate that the UWL will not restrict the flow of a 100-year flood, reduce the temporary water storage capacity of the floodplain (i.e., will meet "no-rise" parameters), or result in a washout of waste so as to pose a hazard to public health or the environment. In order to satisfy the MDNR requirements in this regard, a comprehensive flood study was commissioned by Ameren Missouri and performed by CDG Engineers. CDG Engineers' study is attached hereto as Schedule CJG-S12. The results of this study demonstrated that construction of the proposed UWL will have no effect upon the 100-year base flood elevation of the Missouri River and meets all "no-rise" requirements, which means that

construction of the UWL meets the first two criteria. And as Mr. Putrich discusses in his surrebuttal testimony, the design of the proposed UWL will also ensure that there will be no washout that would pose a risk to the public. I think it is important to remember that coal combustion products (CCPs) disposed of in a UWL are nothing like wet-sluiced ash disposed of in ash ponds (like those that exist at Labadie today) or like municipal waste landfills that hold all kinds of waste. To the contrary, the CCPs disposed of in a UWL are stored as what is essentially concrete. Attached hereto as Schedule CJG-S13 is a picture of a cylinder created from CCPs of the type produced by Labadie. It is, for all practical purposes, a block of concrete. As you would imagine, this block of concrete would not "wash out"—even in the unlikely event that it was impacted by water.

Q. Please explain why the proposed UWL meets these "no-flow restriction" and "no-rise" requirements.

A. During flood conditions, the proposed UWL site will be situated in a "hydraulic shadow" created by the Labadie Energy Center, which is a much larger structure that blocks the high velocity main flow of the Missouri River during a flood. As the CDG Engineers' report explains, the UWL will sit inside an "ineffective area" where water flow during flooding conditions is unaffected. In essence, the water around the proposed UWL during flooding conditions will be "slack water" (i.e., an area of low velocity water). The following image created by CDG Engineers illustrates the slack water in the area where the UWL is planned.



Consequently, the proposed UWL meets the "no-flow restriction" and "no-rise" requirements in the regulations.

Q. Some witnesses made the point that because the facility would be located in the "floodway," it should not be built there. Please respond.

A. The current Federal Emergency Management Agency (FEMA) regulations recognize that certain structures have been and will need to be built within the regulatory floodway of the floodplain. Examples include bridges, water and wastewater treatment plants, power plants, docks, etc. As a result of this, FEMA has established the "no-rise" evaluation. This evaluation, performed by professional engineers, is comprised of a series of calculations that must prove that the construction of a new facility within the floodway will not cause a rise in the base flood elevation. I have performed these calculations for past projects, and CDG Engineers performed these calculations for this project. As noted earlier in this testimony, these

calculations demonstrated that there was indeed a "no-rise" situation, which resulted in Franklin County issuing a Floodplain Development Permit for the proposed UWL.

Q. You earlier mentioned that Franklin County, Missouri, had also approved construction of the UWL in the floodplain. Please explain.

A. Franklin County requires a Floodplain Development Permit in order to locate structures within the floodplain. CDG Engineers' floodplain analysis was submitted to the Franklin County Floodplain Manager as part of Franklin County's floodplain development permit approval process. The Floodplain Manager in turn requested an outside engineering firm review it. The CDG Engineers' report's conclusions were confirmed by the outside engineering firm and by Franklin County, and a floodplain development permit was issued by Franklin County in March 2013. A copy of the approval letter from the outside consulting firm (Andrews Engineering) is attached as Schedule CJG-S14.

III. GROUNDWATER MONITORING

Q. A principal theme of the testimony of several witnesses at the local public hearings related to their concerns about whether the UWL could adversely affect groundwater from which they draw drinking water. How has Ameren Missouri addressed those concerns?

A. First, we have chosen a site the geology and hydrology of which is suitable for the facility, as the MDNR has already concluded and as I discuss above. Second, we have addressed these concerns by designing a facility that has multiple layers of redundancy in order to protect groundwater in the area. These layers of redundancy include a liner system consisting both of an engineered clay liner 24" in depth, a geomembrane, a leachate collection and disposal system, and a groundwater monitoring system. Third, as discussed in detail in the surrebuttal testimony of Ameren Missouri witness Lisa J.N. Bradley, Ph.D, the basis for the testimony about drinking

water concerns reflects a complete misunderstanding of and gross misstatement of the risks associated with coal ash. As both Dr. Bradley and Mr. Gass testify, despite forty-plus years of operation of coal ash impoundments (ponds) at the energy center (one of which is unlined), we have affirmative evidence that the claim that contaminants from ash disposal from the plant will migrate south and east and contaminate drinking water supplies of the neighbors on the bluffs is simply not true. There is therefore no reason whatsoever to believe that there is any material risk of contamination from the proposed UWL, which will store the ash in a solid state, which has an engineered liner system and leachate collection system, and which is ringed by a network of 28 groundwater monitoring wells to serve as even more protection in the very unlikely event the liner or leachate collection systems were to fail.

Q. Since concerns related to possible contamination of groundwater were raised by several local public hearing witnesses, please describe the groundwater monitoring system you referred to in more detail.

A. As I noted, Ameren Missouri has already installed an extensive groundwater monitoring network that rings the UWL site. Schedule CJG-S1 depicts the groundwater monitoring wells that ring the proposed UWL site. The monitoring system is described in a January 2013 Groundwater Monitoring Plan (GMP) submitted to the MDNR, a copy of which is attached hereto as Schedule CJG-S15. Subsequent approval from MDNR was obtained, and the detection monitoring system was installed. Data collection needed to establish the baseline groundwater conditions is currently in progress, with samples being taken on a quarterly basis. Upon completion of this background sampling and prior to MDNR issuing an operating permit for the UWL, the results will be transmitted to MDNR for review.

Q. Do you have an opinion regarding whether these steps are protective of the groundwater in the area?

A. Yes, my opinion is that the combination of all of the measures I discuss above will protect the groundwater in the area. The liner system and the leachate collection system will prevent leachate from the UWL from reaching the groundwater in the first place. Moreover, even if those systems somehow failed, which is unlikely, the extensive groundwater monitoring network would allow early detection of any contaminants well before there would be any material threat to drinking water supplies.

Q. Is there other evidence that groundwater supplies for drinking water have not been impacted by the Labadie Energy Center's operations over the past 40-plus years?

A. Yes. Dr. Bradley also addresses this in her surrebuttal testimony. In addition to the two rounds of sampling data from the monitoring wells that ring the proposed UWL site, we also have results from deep water wells drilled into bedrock (the depth from which drinking water would be taken) near the boundary of the Company's property toward the residents who live on the bluffs. The results from sampling from those wells demonstrate the absence of any impact from coal ash management at the energy center which, for the reasons discussed earlier, is not surprising. Copies of the installation report and sampling results reports from these installations are attached hereto as Schedules CJG-S16 and CJG-S17, respectively.

Q. Did any local public hearing witnesses actually claim that their drinking water had been or was in actual danger of being impacted by constituents in CCPs from the Labadie Energy Center?

A. No, they did not. Despite the expression of such concerns and their knowledge that the plant has been operating on the site and disposing of CCPs there for decades, only two witnesses indicated that they had had their wells tested: Mr. John George (approximately seven years ago) and Mr. Adrian Hutton (approximately 15 years ago). According to their testimony, the test results in both instances indicated no contamination.

Q. Many of the local public hearing witnesses were members of Intervenor Labadie Environmental Organization (LEO), a group that opposes the UWL. Did Ameren Missouri request permission (at its expense) to sample drinking water wells in the vicinity, including those of LEO members?

A. Yes, we did. LEO filed a lawsuit in Franklin County Circuit Court challenging the adoption of the zoning amendment that authorizes UWLs in Franklin County. Ameren Missouri filed a motion asking for permission to sample drinking water wells in the area. LEO opposed the motion, and for reasons that I understand to have been procedural, the motion was denied.

Q. Why did Ameren Missouri seek to sample these wells?

A. Because we are confident that the Labadie Energy Center has not and will not impact the groundwater that is used for drinking water by those who own property east and south of the proposed UWL site. While LEO may claim that such sampling in the context of the lawsuit was inappropriate, my point is that they should welcome such sampling. If they were right and it showed a problem, they would want to know that. If they are wrong, which the evidence indicates is the case, it should alleviate their concerns. However, it would also undermine their opposition to the UWL.

Q. Several local public hearing witnesses raised questions about the existing ash impoundments and suggested that Ameren Missouri is out of compliance with permitting requirements for those impoundments. Is that true?

A. No, it is not. Ameren Missouri has in place a valid and in-effect NPDES permit governing discharges from the existing ash ponds. The current permit remains in effect pending MDNR approval of a new permit. Ameren Missouri has timely applied for a new permit. The reason Ameren Missouri has not received a new permit to date is because of *MDNR's* decision to

delay issuing new NPDES permits until the federal Environmental Protection Agency (EPA) finalizes pending federal regulation changes relating to thermal standards under Section 316b of the federal Clean Water Act. MDNR has indicated its belief that pending its renewal process, Ameren Missouri is in full compliance with the Missouri Clean Water Law (and thus its NPDES permit). A copy of MDNR's letter to LEO/Sierra Club attorney Maxine Lipeles confirming that this is true is attached hereto as Schedule CJG-S18.

Q. An issue was also raised during the public hearings noting that Ameren Missouri's current ash impoundments at its Labadie Plant have been leaking and potentially contaminating the groundwater – is this true?

A. During regular dam safety inspections of Labadie Plant's unlined bottom ash pond, two seeps at the toe of the berm around the pond were identified. Ameren Missouri met with MDNR officials at the site to review the issue. There were no immediate concerns from MDNR. However, out of an abundance of caution, Ameren Missouri installed a grouted slurry wall that has prevented these seeps. Of course, the proposed UWL, including its liner system and leachate collection system that will replace both the existing unlined bottom ash pond and the fly ash pond, is a significant improvement in ash management in accordance with best practices and, as Mr. Putrich discusses, USEPA's own proposed regulations for the disposal of ash.

IV. ALTERNATIVES TO PROPOSED UWL

Q. An issue was raised during the local public hearings regarding whether alternatives to constructing the UWL at the proposed site had been examined. The Commission also directed the parties to address the issue of whether there had been studies of alternative sites and to provide any such information. Were alternative sites studied?

A. Yes, they were. In fact, disposing of the CCPs from the Labadie Energy Center was studied for 22 other sites in the region before the decision was made to construct the UWL adjacent to the current Labadie footprint.

Q. Please explain.

A. While in the planning stages of the Labadie UWL project, Ameren Missouri engaged the services of a consultant – Reitz & Jens Consulting Engineers (R&J) – to review alternatives for CCP disposal at the Labadie Energy Center (as well as for Ameren Missouri's other coal-fired power plants). The 2003 study, attached hereto as Schedules CJG-S19 and CJG-19A (HC) (entitled *AmerenUE Utility Waste Landfill Feasibility Study*), provides details of the expected costs at the time of constructing and operating a UWL. Additionally, Ameren Missouri engineers reviewed existing third-party licensed landfills for potential disposal of CCPs. The attached spreadsheet (Schedule CJG-S20HC) was developed and provided approximate costs at the time for CCP disposal and transportation at various third party landfills. Documentation was also received from Fred Weber, Inc. (a local contractor who owned and operated several landfills at that time) that further demonstrated the approximate disposal costs for Labadie CCPs. I am also attaching as Schedule CJG-S21 HC, a PowerPoint presentation and site review matrix that provide details of sites that were reviewed as part of the study.

Q. What did the study show?

A. The R&J study demonstrated that estimated disposal costs for an Ameren Missouri-owned and operated UWL adjacent to the Labadie Energy Center would be far less than disposing of the CCPs at another site. The estimated costs of disposal at the proposed UWL were at the time between $5.40 - $8.00 per ton, as compared to disposal costs elsewhere of between $15.87 - $43.82 per ton. 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 materials, various options were reviewed for each plant, and options were also reviewed for a regional landfill that would service multiple plants. Ultimately, Ameren Missouri was precluded from creating a regional landfill at Labadie by the Franklin County Land Use Ordinance which was recently passed and pertains to UWLs. Under various scenarios that were studied, however, it was clear that an on-site facility for disposal of Labadie's CCPs was the lowest cost option by a large margin.

Q. What is the principal driver of the higher costs of disposal elsewhere?

A. Simply put – transportation costs. We estimate that initially we would have to run approximately 3,500 truckloads per month (approximately 42,000 per year or about 160 per working day) from the plant to an off-site disposal site. We presently would expect that in a few years, we will have to install flue gas desulfurization units (scrubbers) at Labadie, which would increase the required number of trucks to more than 53,000 per year, or more than 200 trucks per working day.[3] These trucks would be utilizing the Labadie community, Franklin County and other roadways and would add an extremely significant amount of traffic on a two-lane blacktop road running through Labadie and wherever else the trucks would have to traverse to reach their destination. The currently proposed UWL avoids this additional issue.

Q. Although the reduced risks from such traffic is one reason supporting selection of the area adjacent to the energy center for a UWL, wasn't Ameren Missouri more concerned with the cost than it was the environmental appropriateness of the site?

A. While Ameren Missouri is always concerned with providing safe and reliable electrical power to its customers at the lowest reasonable cost, if the proposed site did not meet

[3] Over an eight hour working day, these figures equate to 20 to 25 trucks *per hour* every single working day of the year for approximately 25 years.

the requirements set out by MDNR which are designed to protect both human health and the environment, cost considerations would not matter—the site would not have been approved, regardless of the cost savings to the ratepayers. However, in this case, we were able to design and construct an appropriate facility on a suitable site and, at the same time, dispose of the CCPs at the lowest reasonable cost to ratepayers.

Q. You made reference to the Reitz & Jens cost study, and have provided information about it with this testimony. Have any other studies been done?

A. Because the Commission specifically requested information on studies, I decided to conduct further study to confirm what the data from the Reitz & Jens study had already indicated. This additional study looked at two things that we had not previously examined formally or in detail. First, because the transportation and third-party landfill costs from the Reitz & Jens study were from 2003,[4] we updated those costs to current figures to account for changes (essentially inflation) since that time. Second, now that we have specifics on construction costs, timing of future cells, closure costs, etc. (that we did not have at an earlier time when the UWL had not been fully designed), we have conducted a revenue requirement study to compare the impact on rates of the proposed UWL versus a UWL elsewhere versus transporting the CCPs off-site for disposal.

Q. What do these studies show?

A. Updating the off-site transportation and disposal costs reveals that those costs have increased substantially (in general, transportation costs have roughly doubled since 2003, and third-party disposal fees have increased by at least that much). The increased costs are driven by a number of factors – in particular, inflation associated with the costs of trucking

[4] The dollars are from 2003 because we have been engaged in planning to address the fact that our current ash impoundments will reach capacity for some time and because the permitting process through MDNR is a thorough and lengthy one – typically five years or longer in length.

equipment, fuel, labor (truck drivers), etc. Moreover, when the original study was done, we assumed that if we did transport the CCPs off-site, we would do so in dump trucks. Franklin County's new land use ordinance prohibits this and requires that we use enclosed tanker trucks, which carry higher transportation costs, therefore, we will be unable to use dump trucks for a substantial majority of the ash. While the costs to build and operate the on-site UWL have also changed, the increase in those costs has been substantially out-paced by the increase in transportation/off-site disposal costs.

Also, when comparing the impact on rates, it can be readily seen that it is substantially less costly (by nearly $100 million or more) to dispose of the CCPs from Labadie on-site versus off-site. And this substantially lower cost is apart from the fact that any off-site disposal would require that we, and those using the roads from the plant to the disposal site, be exposed to the risks that the tens of thousands of trucks that would be needed per year would pose.

Q. Can you please explain how the revenue requirement analysis was done?

A. Yes. A revenue requirement for a capital improvement like the UWL consists of four components: the return (including income taxes thereon) on the asset, depreciation, property taxes and operating costs. We used the capital costs of the UWL – the initial cell and estimates for the future cells, applied the Company's Commission-approved return on rate base grossed up for income taxes to it, applied the Commission-approved depreciation rates for this kind of asset, and accounted for property taxes and operating and maintenance costs. We did this for the years 2016 to 2058, when all post-closure activities are expected to be complete. We then summed each year. We did the same analysis for an off-site UWL, but also accounted, as additional operating and maintenance costs, for the transportation costs to get the CCPs to the off-site facility. Finally, we ran a scenario of off-site disposal at a third-party landfill, which essentially consists of the annual costs of transportation and disposal fees. We compared the

sum of the annual revenue requirements for each scenario. As the table below shows, the on-site UWL results in ratepayers paying far less than the other options. As I noted earlier, the other options also pose risks and practical difficulties not present in the on-site UWL scenario.

SCENARIO	SCENARIO DESCRIPTION	COST OF SCENARIO
One	On-Site Labadie UWL	$256,878,736
Two	Transport CCPs to Off-Site UWL	$351,198,736
Three	Transport CCPs to Commercial Landfill	$516,402,000

Q. Can you please relate these updated figures to the figures from the earlier studies, when you had estimated that the cost per ton to dispose of the CCPs on-site was between $5.40 and $8.00 per ton versus between $15.87 and $43.82 per ton off-site, using the 2003 figures?

A. Yes. Nearly 16 million tons of CCPs must be disposed of over the life of the proposed UWL. The updated analysis using current information indicates that the cost per ton for disposal on-site will be more than $16 per ton. Corollary figures for the second scenario studied (disposal off-site in a new UWL not located at the plant) are more than $22 per ton and for the third scenario studied (disposal off-site at a third-party landfill), just under $33 per ton.

Q. In your opinion, are the updated studies conservative?

A. Yes, they are conservative in the sense that they very likely understate the true cost of scenarios two and three. Over the next 30 years, we can expect substantial increases in transportation costs, just as we saw those costs go up by a factor of about two in the last 10 years. Those transportation costs are a huge driver of the higher costs of scenarios two and three.

While we could see some increase in operating and maintenance costs for the UWL or items like property taxes, those kinds of items, based on history, just do not escalate at nearly the rate transportation does. Consequently, I would fully expect that the gap between scenario one and scenarios two and three will widen over time.

Q. When were these updated studies done?

A. They were completed this week. I would note that workpapers relating to them will be provided to the parties shortly after the filing of this testimony. I have also attached the study materials on Schedule CJG-S22.

Q. Aside from the higher costs and the risks of having thousands of trucks per year leaving the plant with coal ash, are there other concerns associated with having to truck the coal ash off-site?

A. Yes. The tanker trucks are pneumatic trucks. Wet fly ash cannot be transported in that kind of truck. The plant today does not have nearly enough dry ash handling and loading capacity to handle the volumes that will have to be disposed of, and we have not accounted for the capital and operating costs that would have to be incurred to design and install additional facilities to even make off-site disposal possible. Those costs will mean higher revenue requirements than we have depicted above for the scenarios for transporting the coal ash off-site. Moreover, we expect the disposal fees at third party landfills to be higher than we have assumed because those landfills do not have the equipment or configurations they would need to accept the dry coal ash from the thousands of trucks they would have to accept each year. They would have to invest in that equipment and configuration, and they would reflect that investment in the price we would have to pay.

Q. What about the suggestion made at the local public hearings that Ameren Missouri should just send the CCPs back to the mines in the rail cars used to deliver coal?

A. This is not a feasible option for several reasons. First, the mines, which are located more than a thousand miles away in Wyoming, are not equipped to receive or even permitted to receive CCPs. Second, even if they were (Ameren Missouri has no ability to force them to equip their mines to accept them or to obtain permits, even if doing so was possible), the transportation costs would be prohibitively high, as indicated by the R&J study and the updated data. Further, even those prices would (wrongly) assume that open hopper cars could be used for the transportation. In fact, the open hopper rail cars used to transport coal are not suitable for carrying the powder-like fly ash CCPs. Instead, tank type (enclosed) cars would need to be utilized, which substantially increases costs and disposal complexity. Additional costs would also be required to get the tank type cars from the railroads' mainline down the sidings to the plant and then back to the mainlines (i.e., Ameren Missouri contracts with a licensed locomotive operation firm to take the coal cars from the railroads and bring them into the plant; the same kind of arrangement and the associated costs would need to be entered into for the tank car trains). We would also have to invest in the additional dry ash handling and loading systems that I described earlier. In summary, sending the CCP back thousands of miles to Wyoming is neither practical nor cost-effective.

Q. Some local public hearing witnesses suggested that Ameren Missouri simply recycle all of the CCPs, and if Ameren Missouri did so, it would not need the UWL. Are they correct?

A. No, they are not. Ameren Missouri already aggressively recycles all of the CCPs that it can. Ash materials are typically utilized in the local construction market and compete against other available materials in the marketplace, including mined resources, other byproduct materials, and other ash production sources. Like many mined resources, it's difficult to transport ash materials any great distance and still have a competitive product in the marketplace.

Transportation is the single largest component in determining the ash customers' cost and, ultimately, demand for these materials.

Labadie produces two ash product materials – fly ash and bottom ash. Fly ash is the finely divided material which, when meeting all technical standards, has its highest market value when sold into the construction industry as a partial replacement for cement in concrete mixes. While not a necessary component, fly ash at a 20%-30% cement replacement rate improves the engineering performance characteristics of concrete mixes. Because fly ash is typically sold at a lower cost than cement, it can improve the profitability to the concrete producer. Bottom ash is a non-specification aggregate-like material which can be used in its raw form for winter traction control for public safety or as raw feed material for cement manufacturing. Bottom ash can also be screened to produce sized aggregate that can be in use in cement block production, paving aggregate and filler type applications. However, due to transportation costs, the limitation on nearby sites that need the ash, and overall supply/demand, there simply is not a market for nearly all of Labadie fly ash. In fact, fly ash production from Labadie alone exceeds the St. Louis area fly ash market demand by 200% to 300%. We are also unable to dispose of nearly all of the bottom ash we produce.

The bottom line is that even with the aggressive recycling program we have in place, we estimate that over the life of the UWL we will need to dispose of nearly 16 million tons of CCPs. We must have a UWL to properly dispose of these CCPs.

V. MDNR PERMITTING PROCESS

Q. Questions were raised at the local public hearings regarding the status of the permitting process at the MDNR. Can you please explain where that process stands?

A. As discussed in my direct testimony, a Construction Permit Application (CPA) was submitted to the MDNR in February 2013. MDNR provided their initial review comments

in May 2013. On August 7, 2013, Ameren responded to these comments (see Ameren Missouri's August 7, 2013 reply, in which Ameren Missouri sets out each MDNR comment and then provides its response). Ameren Missouri also updated the CPA at that time. Schedule CJG-S23, attached hereto, contains the updated CPA and the reply to MDNR. In summary, Ameren Missouri essentially agreed to any additional steps MDNR requested and agreed to provide any additional information requested by MDNR. MDNR is currently reviewing our responses, and we expect all outstanding issues to be resolved over the next 60-90 days. The issues raised were routine, and they should not impact our ability to satisfy all MDNR requirements needed to obtain the required Construction Permit, which we expect MDNR to issue in early February 2014. Approval of the CCN request in this case and issuance of MDNR's Construction Permit would allow construction to begin in the summer of 2014 and conclude in 2015. The UWL is planned to be operational in 2016. During operation of the UWL, Ameren Missouri will be required to perform regular and routine monitoring of the UWL. This will include regular groundwater monitoring, which will be submitted to and reviewed by MDNR. This process is on-going at Ameren Missouri's other UWL, located at its Sioux Plant. On an annual basis, Ameren Missouri is required to submit documentation to the MDNR of its financial ability to fund closure and post-closure care for the UWL.

VI. OTHER MISCELLANEOUS ISSUES

Q. At least one witness expressed concerns about whether the Labadie facility could accept waste from other locations. Can you comment on this concern?

A. Yes. Under the Franklin County Land Use Ordinance we are not allowed to accept CCPs from other locations. We have reflected this restriction in the CPA, and it will be a condition in the permit to be issued by MDNR.

Q. Local public hearing witnesses raised concerns about who would be responsible for cleanup costs that might arise in the future as the result of a disaster at the UWL; for example, Ms. Petra Haynes raised concerns at the June 25, 2013 local public hearing about potential cleanup costs should something go wrong with the landfill. In your opinion, are these concerns regarding the responsibility for cleanup costs valid?

A. No.

Q. Why not?

A. The plan for landfill construction shows that the UWL is to be constructed in phases, effectively one cell open at any one time of operation (this is a typical approach for UWLs and other solid waste disposal facilities). Once the active disposal area of one cell is approximately 70% filled, construction will begin on the subsequent cell. With this build-out plan in mind, the financial responsibility and capital outlay for closure is best managed. As a long-term plan, Ameren Missouri has voluntarily agreed to provide a 20-year post-closure plan, including groundwater monitoring. While we will need to invest a total of about $79 million over the next 10 to 15 years to fully construct the entire facility, these sums are relatively minor as compared to the approximately $600 million of capital investments annually that we have historically made in our electric generation and delivery infrastructure. To put the $79 million in further perspective, we currently have gross plant in service of nearly $15 billion.

VII. SUMMARY

Q. Please summarize your testimony.

A. Ameren Missouri has been working diligently towards providing the lowest reasonable cost alternative for disposal of its Labadie Plant's CCPs while also adhering to all applicable federal, state, and local regulations. Our engineers have worked closely with each regulatory entity to ensure that the design is both cost-effective and meets or exceeds all

requirements, the purpose of which is to ensure that the landfill is constructed at an appropriate site and does not threaten human health or the environment. The design will also be compliant with proposed federal EPA guidelines for CCP landfills, as Mr. Putrich explains. Since starting this process nearly six years ago, our engineers and consultants have met all zoning and permitting requirements from those agencies with jurisdiction, Franklin County and the MDNR (various divisions). As compared with other off-site facility alternatives, this design has been shown to be the most cost effective and eliminates the transportation of the CCPs to an off-site facility. The proposed UWL design is based on solid engineering, is the lowest cost alternative, and is protective of the environment.

Q. Does this conclude your direct testimony?

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.	)	File No. EA-2012-0281

AFFIDAVIT OF CRAIG J. GIESMANN

STATE OF MISSOURI)
) **ss**
CITY OF ST. LOUIS)

Craig J. Giesmann, being first duly sworn on his oath, states:

1. My name is Craig J. Giesmann. I work in the City of St. Louis, Missouri, and I am employed by Union Electric Company d/b/a Ameren Missouri as Managing Supervisor of Hydro Engineering.

2. Attached hereto and made a part hereof for all purposes is my Surrebuttal Testimony on behalf of Union Electric Company d/b/a Ameren Missouri consisting of 24 pages and Schedules CJG-S1 to CJG-S23, all of which have been prepared in written form for introduction into evidence in the above-referenced docket.

3. I hereby swear and affirm that my answers contained in the attached testimony to the questions therein propounded are true and correct.

Craig J. Giesmann

Subscribed and sworn to before me this 13 day of September, 2013.

Notary Public

My commission expires:
4/19/2017

SUSAN WESTERMEYER
NOTARY PUBLIC
NOTARY SEAL
COMMISSION #13772827
MY COMMISSION EXPIRES 4/19/2017
ST. LOUIS COUNTY
STATE OF MISSOURI

Schedules CJG-S10, CJG-S12 and CJG-S23HC
are too voluminous to be uploaded into EFIS
and will be provided via CD