Exhibit No.:	
Issue(s):	Hydrogeology Issues Raised by Charles H. Norris
Witness:	Tyler E. Gass
Sponsoring Party:	Union Electric Company
Type of Exhibit:	Sur-Surrebuttal Testimony
Case No.:	EA-2012-0281
Date Testimony Prepared:	October 10, 2013

MISSOURI PUBLIC SERVICE COMMISSION

Case No. EA-2012-0281

SUR-SURREBUTTAL TESTIMONY

OF

TYLER E. GASS

ON

BEHALF OF

UNION ELECTRIC COMPANY
d/b/a AMEREN MISSOURI

Louisville, Colorado
October, 2013

Sur-Surrebuttal Testimony

of

Tyler E. Gass

Case No. EA-2012-0281

Q. Please state your name and business address

A. Tyler E. Gass, Integral Consulting Inc., 285 Century Place, Suite 190, Louisville, CO 80027.

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

A. I am employed by Integral Consulting Inc. as Principal and Chief Hydrogeologist.

Q. Are you the same Tyler E. Gass who filed surrebuttal testimony in this case on September 13, 2013?

A. Yes.

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

A. My testimony will address several contentions made by Charles H. Norris in his testimony submitted on behalf of the Labadie Environmental Organization (LEO) and the Sierra Club on September 13, 2013.

Q. At page 9, line 4 of his testimony Mr. Norris claims that the existing unlined and lined ash ponds at the Labadie Energy Center (Labadie), which have been in operation since approximately 1970 and 1993, respectively, have likely polluted groundwater and surface water. At page 11 he notes that the given groundwater flows in the area, which

generally run from the area of the current ash ponds toward the proposed UWL area, it is likely that contamination of the proposed UWL area from the existing ash ponds has occurred. Is there any evidence to support his claims?

A. No, not only does Mr. Norris fail to point to any data that supports his claims, there is data the directly refutes them As I discussed in my surrebuttal testimony, there exists data from three bedrock monitoring wells, and from alluvial aquifer monitoring wells recently installed around the perimeter of the proposed UWL that demonstrate that the area Mr. Norris claims is in fact contaminated from the existing ash ponds has experienced no such contamination, even though the area of the proposed UWL and some of the wells from which groundwater monitoring samples have been taken, are downgradient of the existing ash ponds. . I base this opinion on actual data as reflected in several reports containing the results of recent groundwater monitoring (Golder, 2012; Reitz & Jens, April 2013; and Reitz & Jens, August 2013), which are also discussed in detail in Schedule JJNB-S13 to the surrebuttal testimony of Ameren Missouri witness Lisa J.N. Bradley, Ph.D, DABT. Groundwater quality data presented in these reports demonstrate the absence of the claimed impacts from the ash ponds as alleged by Mr. Norris.

Q. Mr. Norris has stated (page 7, lines 15 – 17) that the "DSI for the UWL demonstrates that contamination from the existing ash ponds would migrate from the (ash) ponds to and across the area of the UWL." He goes on to claim (page 7, lines 17-19) that "[t]his requires a substantially more sophisticated and therefore expensive, monitoring

program than Ameren has proposed to demonstrate that the UWL is not contaminating groundwater. Do you agree with this opinion?

A. As previously stated, existing groundwater monitoring data for the bedrock aquifer, and the alluvial aquifer collected from the new UWL groundwater monitoring network to establish ambient groundwater quality conditions indicate that the ash ponds have not impacted the groundwater quality as incorrectly claimed by Mr. Norris. Furthermore, as I stated in my surrebuttal testimony the proposed UWL groundwater monitoring network is sufficiently robust to ascertain whether contamination has been caused by the UWL or by the ash ponds. Frankly, Mr. Norris' opinion regarding the need for a "more sophisticated monitoring program" has no scientific foundation, nor does he provide any data or analyses to support his opinion.

Q. Do you have a response to Mr. Norris' concerns about Ameren Missouri's qualifications to operate the proposed Labadie UWL based on the possibility that coal ash pollutants "may have contaminated or may be migrating toward groundwater at the proposed Labadie UWL."?

A. As stated earlier, there is no evidence or data to support Mr. Norris' statements that coal ash pollutants have contaminated groundwater at Labadie. Therefore, his claims about groundwater contamination that does not exist provide no basis for his assertions that Ameren Missouri is not qualified to operate the Labadie UWL.

Q. What about Mr. Norris' claim (page 11) that if there was leakage it would migrate vertically (down) to the water table?

A. Mr. Norris is correct in saying in a hypothetical situation if coal ash contaminants were to leak out of an impoundment, the migration would be vertical to the alluvial aquifer, but that isolated statement only tells a part of the story. As Mr. Norris concedes, the primary direction of groundwater flow is horizontal. In fact, the aquifer's ability to transmit water horizontally is ten to 100 times more than it is to transmit water vertically. This means that at Labadie the direction of flow would be from the ash pond area across a portion of the proposed UWL, meaning there is no reason to believe that any contaminants that could escape would descend vertically through the alluvial aquifer under the ash ponds sufficiently to reach the deep, bedrock aquifer several hundred feet below. That this is true is consistent with Mr. Norris' own Exhibit 2, which is a CH2M Hill study relating to the ash ponds at Ameren Missouri's Meramec Energy Center (dated December 16, 1997). Meramec, like Labadie, is located next to a major river where the geologic conditions share a number of similarities, including that the horizontal flows are much greater than the vertical flows. Consequently, Mr. Norris's discussion of vertical flows is misleading because it suggests the likelihood of deep bedrock aquifer contamination when the hydrogeology indicates that this would not occur. If anything, contamination from leakage would be expected to move horizontally to part of the area of the proposed UWL. Yet after 40-plus years of operation, the data indicates that this has not happened.

Q. Do you have a response to concerns about Ameren Missouri's qualifications to operate the proposed Labadie UWL based on the adequacy of its planned groundwater monitoring network for the UWL?

A. As I have stated in my surebuttal testimony, the groundwater monitoring network for the proposed UWL is "robust" and was designed by a well-qualified engineering firm in consultation with MDNR, and indeed was approved by MDNR.. Mr. Norris' concerns are baseless, and without foundation. I would note that Mr. Norris has never presented any scientific calculations or analyses to support his statements.

Q. Mr. Norris suggests (page 22, line 7) that there could be "Karst" features at the proposed UWL site. Do you have an opinion as to whether the bedrock geology beneath the alluvium at Labadie exhibits Karst features?

A. Yes. My opinion is that there are no Karst features at the site. My opinion is based upon the fact that there is no evidence that Karst features exist in the bedrock underlying the proposed Labadie UWL site. Even the schedule presented in Mr. Norris' testimony (Appendix 1) does not support his opinion in that it shows no Karst features at the site. More importantly, the Geotechnical testing of the site performed by Gredell Engineering Resources, Inc. as discussed in Gredell's March, 2011 report demonstrates the absence of any Karst features in the bedrock beneath the Labadie alluvial aquifer.

Q. Mr. Norris also references the reliance of the community on the alluvial aquifer in the bottoms for drinking water supplies. Does the community of Labadie rely on drinking water derived from the alluvial aquifer?

A. No, the community of Labadie and homes in the immediate vicinity of the area rely on drinking water derived from wells completed in bedrock, hydraulically upgradient of the Labadie Energy Facility. They rely upon the deep bedrock aquifer for several reasons. First,

Missouri Department of Natural Resources regulations prohibit drinking water wells that use the alluvial aquifer. Second, water quality in the alluvium is high in certain constituents that would make it aesthetically unsatisfactory for residential drinking water use. Third, the Labadie bottomlands are susceptible to flooding which makes the alluvial aquifer highly susceptible to contaminants in floodwaters.

Q. Would residential bedrock water supply wells be affected by the alluvial aquifer should it be impacted by contamination derived from any source?

A. No. As stated in my surrebuttal testimony, the bedrock drinking water supply wells in the vicinity of Labadie are positioned hydraulically upgradient of the alluvial aquifer and flow is primarily from the bedrock to the alluvium. When local groundwater gradients are reversed for short periods during flood events there is no or minimal reversal of flow into the bedrock aquifer as explained in my prior testimony, and there has not been any data presented to indicate residential wells completed in bedrock have been affected by flooding of the Labadie Bottomlands.

Q. Mr. Gass, does this conclude your Sur-Surrebuttal Testimony?

A. Yes.

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 TYLER E. GASS

STATE OF COLORADO)
) **ss**
COUNTY OF BOULDER)

Tyler E. Gass, being first duly sworn on his oath, states:

1. My name is Tyler E. Gass. I work in the City of Louisville, Colorado, and I am employed by Integral Consulting Inc. as Principal and Chief Hydrogeologist.

2. Attached hereto and made a part hereof for all purposes is my Sur-Surrebuttal Testimony on behalf of Union Electric Company d/b/a Ameren Missouri consisting of 6 pages, 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.

Tyler E. Gass

Subscribed and sworn to before me this 10th day of October, 2013.

Notary Public

My commission expires: 7/5/2015

AMANDA FREESE NOTARY PUBLIC STATE OF COLORADO