Exhibit No.: 12
Issue(s): Review of Revised Construction Permit Application
Witness: Tyler E. Gass
Sponsoring Party: Union Electric Company
Type of Exhibit: Supplemental Testimony
Case No.: EA-2012-0281
Date Testimony Prepared: January 24, 2014

MISSOURI PUBLIC SERVICE COMMISSION

Case No. EA-2012-0281

SUPPLEMENTAL TESTIMONY

OF

TYLER E. GASS, P.G., P. Hg.

ON

BEHALF OF

UNION ELECTRIC COMPANY
d/b/a AMEREN MISSOURI

Louisville, Colorado
January, 2014

Supplemental Testimony
of
Tyler E. Gass, P.G., P. Hg.
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 and sur-surrebuttal testimony in this case?

A. Yes.

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

A. The purpose of my supplemental testimony is to address the impact, if any, of the revisions made to Ameren Missouri's Construction Permit Application (CPA) on the opinions expressed in my previously-filed testimonies. The revised CPA was submitted by Ameren Missouri to MDNR on December 11, 2013. I refer to it herein as the "revised CPA."

Q. Have you reviewed all of the changes reflected in the revised CPA as compared to the CPA included as Schedule CJG-23 to Mr. Giesmann's surrebuttal testimony?

A. Yes.

Q. Have you reviewed any other documents in connection with preparing this supplemental testimony?

A. Yes. I also reviewed the comments made by Franklin County's Independent Registered Professional Engineer (IRPE), Andrews Engineering, Inc. (Andrews), on the prior CPA, including Andrews' comments on the existing groundwater monitoring network and all of Ameren Missouri's comments and responses to the IRPE's comments and recommendations.

Q. Are you going to be providing testimony on engineering and/or geotechnical aspects of the IRPE's comments on the prior CPA?

A. No. I believe Mr. Giesmann and/or Mr. Putrich will address the design and engineering aspects of the prior and revised CPAs. Nor am I going to comment on minor engineering clarifications and corrections in the revised CPA.

Q. If you are not focusing on the design, engineering and construction aspects of the CPA, what is the focus of your supplemental testimony?

A. The focus of my supplemental testimony is on the same subject of my earlier testimonies in which I have opined upon the MDNR-approved groundwater monitoring network. This testimony will focus on the subsequent expansion of the groundwater monitoring network, as described in the revised CPA.

Q. Based upon your review of the revised CPA, comments of the IRPE, and Ameren Missouri's responses to the IRPE's comments and recommendations, have the opinions you have previously stated in your prior testimonies changed in any way?

A. No, they have not. There is nothing in the comments of the IRPE, Ameren Missouri's responses to the IRPE, or in the revised CPA that has caused me to alter any of my prior testimonies or the opinions expressed therein. In summary, my opinions were and remain as follows:

- Ameren Missouri has installed a robust and highly effective groundwater quality monitoring network to provide early detection of any chemical compounds that could potentially migrate in groundwater from the UWL.
- Given the use of Best Available Technologies built into the design of the UWL and the hydrogeology of the area, it is extremely unlikely that operation of the UWL would result in contamination of private or public drinking water wells.
- The design of the UWL essentially isolates the CCP from the effects of high groundwater levels or flood waters.
- The UWL represents a much safer alternative to the disposal of CCP than the existing impoundments which have never been found to have caused any groundwater contamination during the past 40 years of operation.

Q. Ameren Missouri has added seven permanent wells to its Groundwater Monitoring network in response to comments of the IRPE and Franklin County's request that Ameren Missouri add these wells. You've indicated the additional wells do not impact your prior opinions. More specifically, can you confirm that the additional wells do not alter your prior opinion that "Ameren Missouri had installed a highly effective groundwater quality monitoring network..."?

A. Yes, I can. The IRPE commented that it may be unreasonable to assume a liner failure (source) of 100 feet in length, and used a source of 5 feet in length as a proxy for determining the width of any plume that could emanate from a liner failure. This in turn led the IRPE to suggest the addition of four additional shallow wells. The very nature of the composite liner consisting of a 60 mil HPDE liner underlain by two feet of very low

permeability clay makes the entire exercise somewhat hypothetical. To justify a small source length (i.e., 5 feet) and the hypothetical need for additional monitoring wells, one would have to assume a tear in the HPDE liner and a comparable failure of the clay liner directly beneath the HPDE liner tear. The probability that this scenario would occur is extremely low. In my opinion, if the HDPE liner were to have a tear, then leachate would spread laterally between the liner and the underlying clay. The leachate would spread across a much larger area of the underlying surface of the clay liner, before it would be able to penetrate or diffuse through the clay, if it were even able to do so at all. My opinion is the same as the opinion of Ameren Missouri's engineers who designed the groundwater monitoring network and, apparently, MDNR as well, which approved it. Regardless, it is my understanding that adding these wells was necessary to obtain County approval and that they do not impair the operation of the existing wells, although they were unnecessary from a hydrogeological perspective.

Q. Can you elaborate further on why the additional wells are unnecessary?

A. Yes. The Groundwater Monitoring network that had been already approved by MDNR was already very robust, consisting of 28 permanent wells. Its purpose was to act as a detection network that would detect any material changes in groundwater quality as compared to pre-UWL conditions, and its configuration – the location and number of wells – was more than adequate to serve that purpose. In my experience, adding additional wells as suggested by the IRPE results in a network more akin to the network one might see installed after there has been an indication that on-site contamination has actually occurred. It is not necessary to add those wells now, because there is no such indication that on-site contamination has occurred or, as I describe below, is reasonably likely to occur in the future.

Q. You previously discussed the four additional shallow wells. Can you please now comment on the County's request that three additional deep wells be installed?

A. Yes. The installation of three additional deep wells, in my opinion, was also unnecessary because the existing network is, as noted, already robust and more than adequate. The theory behind adding the three additional deep wells is that contaminants may migrate vertically (down) and evade detection by the other 28 wells. However, the hydrogeology of the area indicates that this is very unlikely to occur. The hydraulic conductivity (i.e. the ability to transmit water) of the alluvial materials is much higher in the horizontal direction than the vertical direction. In other words, fluids will much more readily move horizontally (by one or more orders of magnitude) than move vertically (downward or upward), thus making it very unlikely that the leachate escaping through the clay liner (in the unlikely event there was an escape) would migrate downward through 100 feet of alluvial material. This propensity for predominantly horizontal flow has long been recognized by MDNR and is supported by the hydrogeology of the site, as I discussed in my prior testimonies.

Q. Does this conclude your Supplemental Testimony?

A. Yes, it does.