

**BEFORE  
THE OHIO POWER SITING BOARD**

In the Matter of the Application of **SENECA**    )  
**WIND, LLC** for a Certificate of            )  
Environmental Compatibility and Public Need    ) Case No. 18-488-EL-BGN  
for a Wind-Powered Electric Generating        )  
Facility in Seneca County, Ohio.                )

**DIRECT TESTIMONY OF**

**Bill W. Kussmann,  
Olsson, Inc.**

**on behalf of**

**Seneca Wind, LLC**

**August 6, 2019**

**Q-1. Please state your name, current title, and business address.**

**A-1.** My name is Bill W. Kussmann. I am a Senior Geotechnical Engineer at Olsson, Inc. My business address is 1700 E. 123rd Street, Olathe, Kansas 66061.

**Q-2. What is your educational background?**

**A-2.** I have a Bachelors of Geological Engineering from the University of Minnesota, as well as a Bachelors of Science of Geology from the University of Minnesota.

**Q-3. What is your professional background?**

**A-3.** I have spent over 21 years working in the field of geotechnical engineering. I have been in my role as Senior Geotechnical Engineer for about 12 years (for the majority of this time with Barr Engineering Co.). In 2019, I left my position with Barr Engineering Co. and joined Olsson, Inc., retaining my same title as Senior Geotechnical Engineer.

**Q-4. What are your current job duties?**

**A-4.** As Senior Geotechnical Engineer at Olsson, Inc., my job duties consist of coordinating and managing projects; performing geotechnical analysis for foundations, dams, levees, other structures; overseeing junior staff; and performing senior review and quality assurance/quality control review of engineering reports.

**Q-5. On whose behalf are you offering testimony?**

**A-5.** I am testifying on behalf of the Applicant in the case, Seneca Wind, LLC (“Applicant” or “Seneca Wind”).

**Q-6. Please describe the history of your involvement with the Seneca Wind project.**

**A-6.** While I was at Barr Engineering Co., I was engaged as the geotechnical project manager and geotechnical engineer of record for the project. I have served in this capacity since I was engaged in 2017, around the start of planning activities for the project.

**Q-7. What is the purpose of your testimony?**

**A-7.** The purpose of my testimony is to sponsor the Geotechnical Engineering Report (“Geotechnical Report”), which is Appendix I to the Application for Certificate of

Environmental Compatibility and Public Need (“Application”). I will also be testifying regarding the existence of karst formations within the project area and the potential measures that Seneca Wind may pursue to address these karst formations prior to construction.

**Q-8. Please discuss the Board’s rules that address an analysis of the geological features of the project area.**

**A-8.** Pursuant to O.A.C. 4906-04-08(A)(5)(a)-(c), the applicant must submit the following information:

- A description of the suitability of the site geology and plans to remedy any inadequacies.
- A description of the suitability of soil for grading, compaction, and drainage, and describe plans to remedy any inadequacies and restore the soils during post-construction reclamation.
- A description of plans for the test borings, including closure plans for such borings. Plans for the test borings shall contain a timeline for providing the test boring logs and the following information to the board: (i) Subsurface soil properties; (ii) Static water level; (iii) Rock quality description; (iv) Per cent recovery; and (v) Depth and description of bedrock contact.

The Geotechnical Report addresses these requirements of the Board’s rules.

**Q-9. What work have you performed?**

**A-9.** I have generally overseen all work pertaining to geotechnical issues at the site that informed the Geotechnical Report. This includes coordinating field activities such as drilling and testing on site, discussing related findings with the project, and assisting the project in making siting decisions. I have also completed a field visit to observe site conditions and survey the site. The culmination of all of these activities was to coordinate drafting and oversee preparation of the Geotechnical Report, which I certified as a Professional Engineer.

**Q-10. What was your role in the preparation of the Geotechnical Report?**

**A-10.** I oversaw preparation of the report by reviewing soil/bedrock conditions, laboratory test results, karst evaluations (coring and video inspections), and all analysis/calculations, and approved the overall report text as Engineer of Record.

**Q-11. Please generally summarize the findings of the Geotechnical Report.**

**A-11.** The Geotechnical Report concludes that most locations indicate sufficient strength, stiffness, and compressibility for support of the proposed wind turbine foundations. Several locations indicated potential for karst conditions, in which cases we recommended localized grouting.

**Q-12. The Geotechnical Report discusses these potential karst features located within the project area. What are karst features?**

**A-12.** Karst features are voids caused by dissolution of soluble rock (in this case, limestone) by groundwater flow through the bedrock. The flowing water may slowly remove the dissolved limestone and can create karst features. Larger scale karst features are commonly called caves, caverns, or sinkholes.

**Q-13. How did you investigate the karst formations?**

**A-13.** The potential for karst features was evaluated specifically by performing rock coring in the limestone and evaluating core recovery and core quality. We also performed video inspections of the core holes to get a direct visual indication of subsurface conditions.

**Q-14. Did you make a determination regarding the magnitude of the potential formations within the project area?**

**A-14.** Yes. Most locations either were not underlain by limestone or the limestone did not exhibit significant potential for karst conditions. Several locations did indicate a potential for karst conditions, and for these locations we recommended grouting to fill the voids locally beneath the proposed foundation footprint.

**Q-15. Are there potential structures within the project area that are located above karst formations?**

**A-15.** There are proposed turbine locations as discussed, as well as other structures (residences, outbuildings, commercial buildings) in the area which are likely underlain by karst features of varying magnitudes.

**Q-16. Please explain what additional testing needs to be performed, if any, to determine the magnitude of the potential karst formations before the turbines are constructed.**

**A-16.** In my professional opinion, the investigations performed thus far at the locations explored to date are sufficient to have suitably evaluated the site for karst conditions. Additional explorations would be required for any sites that are added that have not currently been explored. These additional explorations would entail using the same rock coring and video inspections that have been used at the locations explored to date.

**Q-17. In the Geotechnical Report, you discuss grouting as the recommended method of mitigating karst formations. Please describe this method.**

**A-17.** The anticipated method of mitigating karst features is by utilizing localized grouting to fill the voids, to therefore remove the potential of collapse of the voids beneath the proposed foundations. This likely will be accomplished through injection of a low-mobility cementitious grout material from several drill holes within the foundation excavation, to fill the voids within a conical area directly beneath the foundation footprint. The intent of using low-mobility grout would be to limit the amount of travel of the grout away from the foundation footprint. Use of cementitious grout will be similar to standard concrete mix designs used for typical building foundation construction.

**Q-18. Have you used grouting before to address karst formations or other geotechnical concerns in other projects?**

**A-18.** Yes. Localized grouting to fill voids from potential karst features is the industry standard method to improve subgrade conditions beneath both constructed and proposed structures. I have been involved with design and/or implementation of low-mobility grouting of karst features on several projects, including several other wind farm projects.

**Q-19. Have there been any geotechnical issues with these other projects since grouting was performed?**

**A-19.** Not to my knowledge. While the risk could never be zero, given that you can never have full certainty with a subsurface condition, there is very minimal risk that a properly designed and implemented void filling program will miss something of the size that could affect the turbine.

113 **Q-20. Do the OPSB rules require that a final geotechnical report be prepared before**  
114 **construction begins?**

115 **A-20.** Yes. O.A.C. 4906-4-09(A)(2)(b)(i) requires that the applicant submit a fully detailed  
116 geotechnical exploration and evaluation sixty days before the preconstruction conference.  
117 This final geotechnical report will address whether proposed turbine locations are located  
118 above karst formations and whether potential mitigation measures are recommended.

119 **Q-21. Have you reviewed the July 3, 2019 Staff Report of Investigation issued in this**  
120 **proceeding?**

121 **A-21.** Yes.

122 **Q-22. Condition 16 within the Staff Report of Investigation requires a full detailed**  
123 **geotechnical exploration and evaluation at each turbine site to confirm that there are**  
124 **no issues to preclude development of the wind farm, including subsurface evaluation**  
125 **at each turbine location. Do you believe the Applicant can implement Condition 16**  
126 **as recommended by Staff?**

127 **A-22.** Yes, I do.

128 **Q-23. Does this conclude your testimony?**

129 **A-23.** Yes, it does, except that I reserve the right to update this testimony to respond to any further  
130 testimony in this case.

## **CERTIFICATE OF SERVICE**

I hereby certify that the foregoing Testimony was served upon the following parties of record via regular or electronic mail this 6<sup>th</sup> day of August, 2019.



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**This foregoing document was electronically filed with the Public Utilities**

**Commission of Ohio Docketing Information System on**

**8/6/2019 5:18:26 PM**

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**Case No(s). 18-0488-EL-BGN**

Summary: Testimony of Bill W. Kussmann on behalf of Seneca Wind, LLC electronically filed by Teresa Orahod on behalf of Devin D. Parram