March 3, 2021

To whom it may concern

REF: “Evidence for Aquifer and Slurry Line Contamination and Land Subsidence From Vivian Silica Sand Extraction Wells” a report by Mr. Dennis Leneveu

I have thoroughly reviewed the above-referenced report and my qualifications for so doing are attached to this testimonial.

I can state at the outset that this report is very professionally written, well documented, and evidences very good knowledge of a wide range of related technical issues including mineralogy, well design, chemistry, and regulations. It is clear and compelling to a technical reader.

I found no error in any of the calculations embedded in the report, and fully support the hypotheses for both contamination and subsidence tested by Mr. Leneveu’s analyses of available data. I found only one significant typo in this report: “"The specified sand production rate for the CWS Processing Facility is 1.36 tonnes per year according to the CWS EAP.” This clearly should be 1.36 million tonnes, and Mr. Leneveu’s subsequent calculations are based on the correct value.

In summary, I state that this report should be seriously considered in the decision-making process regarding the permitting of the proposed facility.



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Dr. Ingraffea is a Professor of Civil and Environmental Engineering, Emeritus, and a Weiss Presidential Teaching Fellow at Cornell University where he has been since 1977. He holds a B.S. in Aerospace Engineering from the University of Notre Dame, an M.S. in Civil Engineering from Polytechnic Institute of New York, and a Ph.D. in Civil Engineering from the University of Colorado. Dr. Ingraffea’s research concentrates on computer simulation and physical testing of complex fracturing processes. He has authored with his students and research associates over 250 papers in these areas. Since 1977, he has been a principal or co-principal investigator on over $37M in R&D projects from the NSF, EXXON, Shell, Amoco, NASA Langley, Nichols Research, NASA Glenn, AFOSR, FAA, Kodak, U. S. Army Engineer Waterways Experiment Station, U.S. Dept. of Transportation, IBM, Schlumberger, Gas Technology Institute, Sandia National Laboratories, the Association of Iron and Steel Engineers, General Dynamics, Boeing, Caterpillar Tractor, DARPA, and Northrop Grumman. Professor Ingraffea was a member of the first group of Presidential Young Investigators named by the National Science Foundation in 1984. For his research achievements in hydraulic fracturing he won the International Association for Computer Methods and Advances in Geomechanics "1994 Significant Paper Award", and he twice won the National Research Council/U.S. National Committee for Rock Mechanics Award for Research in Rock Mechanics (1978, 1991). He was named the Dwight C. Baum Professor of Engineering at Cornell in 1992. He became a Fellow in 1991 and a Distinguished Member in 2019 of the American Society of Civil Engineers. He became Co-Editor-in-Chief of *Engineering Fracture Mechanics* in 2005. In 2006, he won ASTM’s George Irwin Medal for outstanding research in fracture mechanics, and in 2009 was named a Fellow of the International Congress on Fracture. TIME Magazine named him one of its “People Who Mattered” in 2011, and he became the first president of Physicians, Scientists, and Engineers for Healthy Energy, Inc. ([www.psehealthyenergy.org](http://www.psehealthyenergy.org)) in that same year. He is a co-author of papers on methane emissions (2011, 2012, 2014, 2016), wellbore integrity in Pennsylvania (2014, 2020), and on conversion of New York (2012) and California (2014) to wind/sun/water power for all energy uses in the next few decades.