

BEFORE THE PUBLIC UTILITIES COMMISSION
OF THE STATE OF SOUTH DAKOTA

0-0

HP 22-002

IN THE MATTER OF THE APPLICATION :
OF NAVIGATOR HEARTLAND :
GREENWAY, LLC FOR A PERMIT UNDER :
THE SOUTH DAKOTA ENERGY :
CONVERSION AND TRANSMISSION :
FACILITIES ACT TO CONSTRUCT THE :
HEARTLAND GREENWAY PIPELINE IN :
SOUTH DAKOTA, :
:
:

**REBUTTAL TESTIMONY
OF MARK HERETH**

0-0

1. Please state your name and business address.

Answer: My name is Mark Hereth. My business address is 2368A Rice Boulevard, Suite 444, Houston, Texas 77005.

2. Have you previously submitted testimony in this matter?

Answer: Yes. I submitted direct testimony dated May 25, 2023.

3. To whose testimony are you responding in rebuttal?

Answer: I am responding to the testimony of Richard Kuprewicz, Bill Caram, and Jon Thurber.

4. In the paper written for the Pipeline Safety Trust attached to his testimony, Mr. Kuprewicz dismisses the definition of carbon dioxide under 49 CFR § 195.2 as “not appropriate to deal with CCS CO₂ pipelines” (pp. 3-4), but he does not refer to the Navigator Heartland Greenway Pipeline. How does that definition apply in this proceeding?

Answer: The definition provides: “Carbon Dioxide means a fluid consisting of more than 90 percent carbon dioxide molecules compressed to a supercritical state.” The definition is appropriate for the Heartland Greenway Pipeline System because the pipeline will transport a stream of carbon dioxide that is at least 98% carbon dioxide and it will be transported in a supercritical state. Thus, the regulatory concerns that Mr. Kuprewicz addressed in the paper for transportation in a different form of carbon dioxide of less than 90% do not apply to this project.

5. Please comment on the “industry standards” referred to in Mr. Kuprewicz’s paper (pages 3 of 14).

Answer: The references to “industry standards” are actually to consensus standards that are developed by work groups including representatives of the public, such as state pipeline safety regulators and PHMSA staff, manufacturers, and pipeline operators. Some standards have included members of the public. The “industry” in this context is not just pipeline operators.

6. Mr. Kuprewicz’s paper states that CO2 pipelines operating in dense phase, either supercritical or as a liquid, are particularly susceptible to running ductile fractures (p. 6) and proposes that PHMSA address this issue through regulation. Regardless of what regulations exist, has Navigator taken steps to mitigate this concern?

Answer: Yes. The ductile fractures that Mr. Kuprewicz discusses are well known and, as addressed in Steve Lee’s rebuttal testimony, can be addressed through a fracture control plan that would include specification of pipe with sufficient toughness, referred to as fracture resistance, to arrest a ductile failure, and also crack arrestors as an alternative (or added measure of control).

7. Mr. Kuprewicz’s paper states that PHMSA should list specific pipeline design methods to arrest fracture propagation (p. 6). Do you agree?

Answer: No. PHMSA's current regulations, 49 CFR § 195.111, require that fracture propagation be addressed. In subpart (a), the regulation provides: "A carbon dioxide pipeline system must be designed to mitigate the effects of fracture propagation." Mr. Kuprewicz might prefer that PHMSA list design methods, but in my experience, fracture design methods have been improved over the last two decades. PHMSA could certainly list them, but additional improvements to existing methods may emerge that improve fracture control. Stating the requirement as a performance standard allows new methods to be used as they are developed and published.

8. Mr. Kuprewicz's paper addresses impurities in a CO₂ stream (pp. 10-12). Are these contaminants an issue for Navigator's pipeline?

Answer: The impurities discussed, water and hydrogen sulfide, can be managed by limiting the allowable concentrations and monitoring the stream to prevent a deleterious impact on pipeline operation and integrity management. I understand that Navigator's quality specification for CO₂ to be transported on its pipeline requires at least 98% purity, and that hydrogen sulfide is not found in carbon dioxide produced by ethanol and fertilizer plants.

9. Mr. Caram states that "we are not ready for a buildout of carbon dioxide pipelines" and that "federal minimum safety regulations are in desperate need of modernization" (Attachment 2 at p. 2). Do you agree?

Answer: No. There is a set of requirements in place today that has been used to build infrastructure that has resulted in one injury related to a CO₂ pipeline since 2002, and that occurred in 2007. According to PHMSA, 45 people sought medication attention at local hospitals after the Denbury incident in Satartia, though none required inpatient hospitalization as a result of the failure. No fatalities resulted. Even so, the one injury in 2007 and the harm

caused by the Denbury incident are unacceptable and operators should strive to achieve zero incidents. Operators and experts working on their behalf and the behalf of PHMSA have identified improvements in fracture control and plume/dispersion modeling and have applied these improvements in advance of PHMSA adopting them into regulation. From a practical standpoint, operators, technical experts, and research organizations will lead in developing new technology and improved processes.

10. Doesn't the cause of the failure on the Denbury system in Startia concern you?

Answer: Yes. It is important to understand that the cause of the failure was ground movement. In its response to the incident, PHMSA issued an advisory bulletin regarding geohazards, including ground movement, not just for CO2 pipelines, but to the entire pipeline industry. The industry has evaluated the potential for ground movement since the adoption of integrity management in the early 2000s but developed a heightened threat of concern in the 2017 timeframe. There was a joint industry project in 2017, entitled, "**Management of Ground Movement Hazards for Pipelines**" (attached as Exhibit A), and another sponsored by the INGAA Foundation in 2020, entitled, "**Guidelines for Management of Landslide Hazards for Pipelines**" (attached as Exhibit B). Geohazards will continue to be a focus area for PHMSA and the industry.

11. Can PHMSA's existing regulations be improved?

Answer: Of course. As stated in my direct testimony, PHMSA has recognized that its CO2 regulations can be improved. PHMSA announced on May 22, 2022 that it was initiating a new rulemaking to update standards for CO2 pipelines, including requirements related to emergency preparedness and response. At a public meeting in December 2022, PHMSA identified topics to be addressed in a future proposed rule. There was input from technical

experts, representatives of the federal and state governments, and the public, including Mr. Caram. PHMSA held another public meeting in May 2023 in Des Moines, at which the public, including Mr. Caram, was well represented. PHMSA's regulatory oversight is not static and regulations change over time, which is appropriate. As a member of PHMSA's Liquid Pipeline Advisory Committee, Mr. Caram is in a unique position to influence this process because the LPAC reviews rules as they are being developed and is one of the final steps between the close of public comment and promulgation of a final rule.

12. William R. Byrd, P.E., states in his testimony that the Commission should defer to PHMSA to review and evaluate Navigator's emergency response plan, which is required by federal regulation (p. 11, lines 7-22). Do you agree?

Answer: Yes. As Mr. Byrd explains, PHMSA has significant knowledge and expertise in this area through full-time employees. In my experience, pipeline operators engage with first responders in developing emergency response plans and first responders can engage with PHMSA staff who work on emergency preparedness and response as part of their ongoing job responsibilities. .

13. Did you see any concerns stated in the testimony of Mr. Caram and Mr. Kuprewicz that make you concerned that Navigator cannot safely construct and operate the proposed pipeline?

Answer: No. My direct testimony addresses the point that CO2 pipelines not only can be, but have been, safely operated. CO2 pipelines have a better incident record than other hazardous liquid pipelines, and pipeline transportation is still the safest way to transport hazardous liquids. Their testimony does not offer any reason why the Navigator Heartland Greenway Pipeline would be an exception to this established history of safe operation.

14. Does this conclude your rebuttal testimony?

Answer: Yes.

Dated this 23rd day of June, 2023.

/s/Mark Hereth
Mark Hereth