BEFORE THE PUBLIC UTILITIES COMMISSION
OF THE STATE OF SOUTH DAKOTA

IN THE MATTER OF THE APPLICATION OF SCS CARBON TRANSPORT LLC FOR AN ENERGY FACILITY PERMIT TO CONSTRUCT THE SUMMIT CARBON SOLUTIONS PIPELINE	DOCKET NO. HP22-001

DIRECT TESTIMONY OF

BRIGHAM A. MCCOWN

ON BEHALF OF

SCS CARBON TRANSPORT LLC

SCS CARBON TRANSPORT LLC EXHIBIT #

NOVEMBER 1, 2022

Q. PLEASE STATE YOUR NAME AND BUSINESS ADDRESS.

A. My name is Brigham A. McCown, and my business address is 1717 Main Street, Suite 3550, Dallas, Texas 75201.

Q. PLEASE STATE YOUR PRESENT POSITION(S) AND AFFILIATION(S).

A. I am the President and Chief Executive Officer ("CEO") of Nouveau, a regulatory and policy consulting firm; the Founder of the non-partisan infrastructure think tank called the Alliance for Innovation and Infrastructure (Aii.org); an Adjunct Professor at Miami University; and a Senior Fellow at Hudson Institute.

Q. WHAT IS YOUR PROFESSIONAL BACKGROUND?

A. I have spent the last three decades in and around the transportation and energy infrastructure industries. I was the federal government's top safety regulator of all pipelines and hazardous materials as the Acting Administrator at the U.S. Department of Transportation's ("USDOT") Pipeline and Hazardous Materials Safety Administration ("PHMSA"). Before that, I served as the Chief Legal Counsel over commercial motor vehicles at the USDOT's Federal Motor Carrier Safety Administration ("FMCSA"). I have also served as an expert, special government employee, and Senior Advisor to the U.S. Secretary of Transportation.

I have had the privilege of serving on a USDOT Federal Advisory Board as the Vice-Chair of Safety Regulations after being appointed by the U.S. Secretary of Transportation. My background includes running one of the world's best-known pipelines as the President of the Alyeska Pipeline Service Company. That entity designed, constructed, operates, and maintains the Trans-Alaska Pipeline System ("TAPS") while ensuring safety and environmental stewardship. In addition, I have served as a safety and regulatory expert and have taught business law, ethics, and regulatory law at Miami University.

I am a retired Naval Officer and Naval Aviator. I obtained a Juris Doctor from Salmon P. Chase College of Law at Northern Kentucky University, a Master of Business Administration from the Mason School of Business at the College of William and Mary, a Bachelor of Arts Degree in Diplomacy & Foreign Affairs from Miami University, and a Graduate Certificate in Energy Innovation and Emerging Technologies from Stanford University.

Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY?

A. The purpose of my testimony is to discuss federal oversight and safety regulation of pipelines as they relate to carbon dioxide ("CO_2") systems and SCS Carbon Transport LLC's South Dakota Project ("Project"). It is critical the public understands how pipeline companies are governed and how pipeline systems work, as well as why they are a valuable and necessary transportation option. I have spent most of my adult life working toward increasing safety in the transportation sector, first in the military, next as a regulatory attorney, and then later working on behalf of the public as a federal regulator responsible for pipeline safety and ultimately as a pipeline operator myself. I am here to discuss why and how pipelines are the safest form of transportation, including how regulators and operators continue to evolve and raise the safety bar.

Q. WHAT IS PHMSA, AND WHAT DOES IT DO?

A. The Pipeline and Hazardous Materials Safety Administration, better known by its acronym "PHMSA," is the federal agency entrusted with the safe and secure movement of hazardous materials by air, land, sea, rail, and pipeline throughout the United States. Congress granted PHMSA broad authority through the Pipeline Safety Act to regulate all safety-related aspects of pipeline transportation, thereby promoting safety and allowing for the free movement of products in or affecting interstate commerce. This legislation requires the agency to utilize data and science to establish regulations to protect the public from threats to life, property, and the environment.

Comprehensive agency regulations address pipeline design, construction, operations, maintenance, integrity management, public awareness, emergency response planning and preparedness, and other topics. In carrying out its duties, PHMSA conducts data analyses, inspection, investigation, outreach, training, research, enforcement, and collaborative efforts to continuously improve safety regulations.

The Pipeline Safety Regulations ("PSRs"), administered by PHMSA directly or in partnership with state agencies, are designed based on the direction given by the Congress and informed by the agency's professional staff of civil servants who collect, study, and analyze the science and data. In addition, these programmatic decisions are informed by advisory committees of federal and state government officials, industry representatives, safety advocates, and other stakeholders who engage the agency during public comment sessions.

Q. DOES PHMSA REGULATE CARBON DIOXIDE PIPELINES?

A. Yes, PHMSA regulates supercritical phase carbon dioxide ("CO_2") lines and has done so for nearly four decades under the Hazardous Liquid Pipeline Act of 1979.[1] CO_2 pipeline safety standards for the design, construction, operations, maintenance, integrity management, public awareness, and emergency planning of CO_2 pipelines are established by PHMSA's Office of Pipeline Safety ("OPS") within the PSRs previously mentioned above.

CO_2 pipelines may seem new to some members of the public as they are being developed and permitted in new areas of the U.S., like South Dakota, for carbon capture and sequestration. The U.S. Department of Energy commissioned a report released in 2015 reviewing CO_2 pipelines in the U.S.[2] Of particular interest is that when the report was published, there were fifty different CO_2 pipelines in operation within the U.S. with a combined length of over 4,500 miles. Currently,

[1] https://www.phmsa.dot.gov/sites/phmsa.dot.gov/files/docs/Hazardous%20Liquid%20Pipeline%20Safety%20Act%20of%201979.pdf
[2] https://www.energy.gov/sites/prod/files/2015/04/f22/QER%20Analysis%20-%20A%20Review%20of%20the%20CO2%20Pipeline%20Infrastructure%20in%20the%20U.S_0.pdf

existing CO_2 pipelines operated in the U.S. total more than 5,000 miles, and some of these systems have been around since the 1950s.[3]

It is important to reemphasize that CO_2 pipelines are not new. They have been built and operated safely throughout many states for over forty years. Nor are they, as a few might suggest, dangerous or underregulated.

Q. WILL SCS CARBON TRANPORT LLC PIPELINES BE REGULATED BY PHMSA?

A. Yes. Based on SCS' operating parameters, found in Section 2.2.1 of its Application[4], its pipelines will be subject to PHMSA regulations. This regulatory oversight includes the design, construction, operations, maintenance, integrity management, public awareness, and emergency planning and preparedness of SCS' South Dakota pipeline system by PHMSA.

Q. ARE YOU FAMILIAR WITH THE CARBON DIOXIDE PIPELINES AND ASSOCIATED HISTORICAL INCIDENT DATA FOR THE UNITED STATES?

A. Yes, from personal experience as the federal regulator over pipelines and as an expert in this field. PHMSA tracks and reports incidents involving pipelines; that information is publicly available through the agency's website.[5] Transparency is essential, and PHMSA does a good job ensuring transparency of safety information. It is worth highlighting that there has not been a single fatality on a CO_2 pipeline operating in the U.S.

[3] https://www.phmsa.dot.gov/data-and-statistics/pipeline/annual-report-mileage-hazardous-liquid-or-carbon-dioxide-systems
[4] https://puc.sd.gov/commission/dockets/HydrocarbonPipeline/2022/HP22-001/AppSup.pdf
[5] https://www.phmsa.dot.gov/data-and-statistics/pipeline/pipeline-incident-20-year-trends

Q. HOW DOES THE PIPELINE SAFETY RECORD COMPARE TO OTHER MODES OF TRANSPORTATION?

A. The U.S. has an excellent safety record when it comes to transportation, and that's especially true when transporting energy supplies. That said, pipelines have an enviable safety record, 99.99% safe[6]. According to PHMSA, pipeline systems are the safest means to move products.[7]

I should also mention that while at PHMSA, I was responsible for rolling out the 811 One Call system throughout the country to address the leading cause of pipeline incidents, damage by third parties. The 811 system has significantly decreased pipeline – and all underground incidents over the last fifteen years, making pipelines safer.

Q. HOW DOES THE AGE OF THE PIPELINE AFFECT ITS SAFETY?

A. Age alone is not determinative of pipeline safety, and we have many examples of pipelines operating safely for over half a century. The pipeline I used to run, TAPS, was placed into service over forty-five years ago. Like other pipelines, TAPS is not the same pipeline as it was back in 1977. It has been updated, modernized, and carefully maintained. Today's pipelines have been built upon innovation and more than half a century of learning. Today's pipelines are designed from the ground up based on the knowledge and experiences learned through operating our almost 3.3 million miles of pipelines on a daily basis. It is safe to say that today's pipelines are designed with innovation in mind.

[6] https://audubooncompanies.com/study-shows-pipelines-are-safest-way-to-transport-oil/
[7] https://www.phmsa.dot.gov/faqs/general-pipeline-faqs

Q. WHAT ARE SOME SPECIFIC ASPECTS OF FEDERAL REGULATION THAT YOU BELIEVE ENSURE PIPELINE SAFETY PERFORMANCE?

A. As previously mentioned, federal safety regulations holistically cover a pipeline system at all phases of its life. Think of the regulations as providing multiple layers of protection. First, the very design of the pipeline is required to meet PHMSA regulations.[8] Certain types of pipe material must be used, and standards must be followed during construction.[9] Before operations of the pipeline system, multiple tests are completed to confirm workmanship[10] and integrity, emergency response planning occurs,[11] and public awareness is conducted.[12] Once the line is placed into service, it must be monitored for performance by the operator and PHMSA.[13] All these layers of protection work together to protect the public from threats to life, property, and the environment. I have highlighted a few specific examples of federal regulations below for public stakeholders.

In the design phase, there are requirements to apply factors of safety to engineering calculations;[14] set minimum distances between shutoff valves;[15] and, specifically for CO_2 pipelines, take into consideration brittle fracture propagation.[16]

During construction, the federal regulations define the minimum depth of cover,[17] minimum percent of welds non-destructively tested,[18] and hydrostatic testing above the pipelines maximum operating pressure.[19] It's worth noting that SCS has committed to a minimum of 48 inches depth of

[8] 49 C.F.R. Part 195, subpart C.
[9] Part 195, subpart D.
[10] Part 195, subpart E
[11] § 195.402(e).
[12] § 195.440.
[13] Operators must be able to demonstrate compliance with all aspects of Part 195, and PHMSA routinely inspects operators to verify compliance.
[14] § 195.106.
[15] §§ 195.258 and 192.260
[16] § 195.111.
[17] § 195.248.
[18] § 195.234.
[19] Part 195, subpart E.

cover, which exceeds the federal requirement of 36 inches. In addition, SCS has stated that it will conduct inspection on 100% of pipeline welds, however, the regulations only require 10%.

Operational safety controls include an operations and maintenance ("O&M") manual;[20] integrity management program including risk assessments;[21] operator training and qualifications;[22] leak detection system;[23] public awareness;[24] right-of-way patrols, and emergency response plan[25] among other requirements.

In sum, PHMSA's regulatory regime is designed to decrease the likelihood of an incident, and in the unlikely event an incident occurs, to mitigate potential harm to life, property, and the environment using multiple layers of protection.

Q. ARE THESE SPECIFIC ASPECTS OF FEDERAL REGULATION THAT ENSURE PIPELINE SAFETY PERFORMANCE APPLICABLE TO CO_2 PIPELINES AND SCS CARBON TRANSPORT LLC PROJECT?

A. Yes, all supercritical phase CO_2 pipelines, including SCS' proposed South Dakota pipelines, in the U.S. must abide by these federal regulations.

Q. WHAT ARE THE VARIOUS TYPES OF INSPECTIONS THAT PHMSA WILL PERFORM ON THE SCS CARBON TRANSPORT LLC PIPELINE?

A. SCS will be subject to recurring inspections covering the entire breadth of the federal pipeline safety program, including, but not limited to, Standard Inspections, Integrity Management Program ("IMP") Inspections, Operator Qualification ("OQ") Inspections, Control Room Management Inspections, New Construction Inspections, and Emergency Response Plan review

[20] § 195.402.
[21] § 195.452.
[22] Part 195, subpart G.
[23] §§ 195.134 and 195.444.
[24] § 195.440.
[25] § 195.402(e).

and approval. These audits encompass reviewing company documents, interviewing employees and contractors, and conducting field visits to confirm compliance with federal pipeline safety regulations.

Q. WHAT IS AN INTEGRITY MANAGEMENT PROGRAM ("IMP")?

A. "Integrity" is a term used in pipeline operations to mean safe and fit for service. An IMP includes numerous activities that must be conducted to ensure a pipeline or pipeline system can be safely operated throughout its lifespan. Inspection of IMPs by PHMSA generally confirms that operators are gathering and using necessary information to assess and mitigate pipeline risks.

During my time at PHMSA, the agency promulgated IMP regulations for the industry to follow covering different types of pipeline programs. IMP applicable to SCS' lines was one of the first to be established.[26] In lay terms, an IMP is designed to holistically monitor pipelines from construction until abandonment. During the entire lifecycle of a pipeline, data is collected and monitored, like the way a doctor might monitor a patient. These observations in the form of raw data and inspections conducted by trained personnel utilizing state-of-the-art technologies help operators and regulators not only understand how well a pipeline is doing but serve as an opportunity to watch for changes to that health over a period of many years. These leading indicators are used to conduct maintenance or make necessary repairs before they would otherwise be noticed. This is a proactive program designed to avoid future incidents and SCS' lines will not only meet but exceed federal requirements as all line-pipe in the system will be piggable and SCS has committed to applying the IMP to the entire line, not just those portions in high-consequence areas.

[26] IMP regulations for hazardous liquid pipelines and CO_2 pipelines are located at 49 C.F.R. § 195.452.

Under the IMP, the entire system will also be protected against earth movement from landslides and subsidence in different geological conditions. Patrols including flyovers will also be used to access the system and to protect it against potential integrity threats from natural or manmade circumstances.

Examinations and tests can include intentionally pressuring the line beyond its normal operating characteristic to test it for leaks and imperfections to running devices (called “pigs") through the lines on regular intervals. Some of these devices clean the lines. Pipelines are also required to operate “smart pigs,” the pipeline industry’s version of an MRI, pass through the interior of the pipeline at regular intervals. These devices can evaluate the line for corrosion, dents, cracks, or other integrity related issues which in time, could later become a concern. These tools use thousands of sensors that collect a large amount of data that is then analyzed to determine if any remedial actions must be taken. The data is also stored so that it can be compared to future data to evaluate changes over time. The pipeline can also be inspected visually through direct assessment techniques and PHMSA conducts routine audits to verify regulatory and programmatic compliance.

PHMSA also has an array of educational and enforcement tools at its disposal if areas of non-compliance were to be found. This authority includes the ability to levy fines, order compliance, or require other corrective actions.

Q. WILL SCS CARBON TRANSPORT LLC BE SUBJECT TO INTEGRITY MANAGEMENT PROGRAM REQUIREMENTS AND INSPECTIONS?

A. Yes. SCS will be subject to IMP requirements[27] and inspections applicable to any other liquid pipeline operating under Part 195.

Q. WHAT ARE CONTROL ROOM MANAGEMENT ("CRM") INSPECTIONS?

A. In essence, the CRM program sets out detailed safety requirements for controllers, leak detection systems, control rooms, and the instrumentation systems used to remotely monitor and control pipelines.[28] These regulations address engineering and management related to human factors, which is to say, the performance aspect of human beings running a control room. This is an area that PHMSA has focused on in recent years, taking cues from the Federal Aviation Administration at the U.S. DOT for Crew Resource Management and from the maritime industry, where it goes by the term Bridge Resource Management. This is exciting because it's used in environments where human error can compound a situation with potentially significant effects, focusing on interpersonal communications and decision-making skills.

Q. WILL SCS CARBON TANSPORT LLC BE SUBJECT TO CONTROL ROOM MANAGEMENT INSPECTIONS?

A. Yes.

Q. WHAT ARE NEW CONSTRUCTION INSPECTIONS?

A. PHMSA inspects new pipeline construction to validate compliance with the design and construction requirements in Part 195.[29] PHMSA Inspectors review design specifications,

[27] 49 C.F.R. § 195.452.
[28] § 195.446.
[29] 49 C.F.R. Part 195, subparts C and D.

construction procedures, quality control and construction records (e.g., welding, hydrotesting, welder qualifications), and field construction activities. If a safety issue is identified during these inspections, it must be addressed prior to starting up the pipeline. It is also noteworthy that SCS will go above federal regulatory requirements by inspecting 100% of all pipeline welds for defects.

Q. WILL SCS CARBON TANSPORT LLC BE SUBJECT TO NEW CONSTRUCTION INSPECTIONS?

A. Yes.

Q. WHAT IS A DISPERSION ANALYSIS, AND HOW IS IT USED?

A. A dispersion analysis is a computer simulation of the distribution of gas or vapor in the unlikely event of a pipeline release. The analysis is conducted by the pipeline operator to determine the extent and concentration of gas during worst-case scenarios. In the case of CO_2, topography is considered because when released CO_2 is denser than air. Dispersion modeling informs risk assessments under the IMP program,[30] emergency response plans and preparedness, and public awareness efforts.

Q. WILL SCS CARBON TANSPORT LLC BE REQUIRED TO PREPARE AND SUBMIT SUCH AN ANALYSIS TO PHMSA?

A. SCS will prepare and submit a dispersion analysis to PHMSA. Because pipelines are considered critical infrastructure, dispersion analyses, risk assessments, and emergency response plans are kept confidential. This is to ensure that no one reading them could potentially use them to undermine safety or intentionally damage a pipeline. These concerns are not taken lightly and are intended to help secure critical infrastructure throughout the United States.

[30] § 195.452.

Q. WHAT IS AN EMERGENCY RESPONSE PLAN?

Federal Emergency Response requirements for CO_2 pipelines are set forth in the Part 195 regulations.[31]. Emergency Response Plans ("ERP") are drafted to provide guidance and structure for a quick, effective, and coordinated response to a pipeline incident with the objective of protect the public, first responders, and the environment. Requirements include, but are not limited to, notifications, response procedures (e.g., field and control room), personnel, equipment, and post-accident review. The National Incident Management System Incident Command System is typically used to manage the emergency response activities because it is a response tool that is readily adaptable to incidents of varying magnitude. Local agencies and first responders are trained on pipeline ERPs in their area and may fill roles during a coordinated response effort.

Note an ERP is one of the last lines of defense after a release has occurred and there are many other important layers of protections that prevent a release from occurring.

Q. WILL SCS CARBON TANSPORT LLC PREPARE AND SUBMIT SUCH A PLAN TO PHMSA?

A. It is my understanding SCS will prepare and make available its ERP to PHMSA.

Q. ARE YOU FAMILIAR WITH THE SATARTIA, MISSISSIPPI CARBON DIOXIDE PIPELINE INCIDENT?

A. Yes, I am. Based on PHSMA's accident investigation report[32], the Satartia pipeline incident occurred after a prolonged period of steady rain-saturated sloped soil around the pipeline, which in turn caused lateral movement of the pipeline and, subsequently, a weld break and CO_2 release. As a result, 200 residents were evacuated with approximately 45-50 seeking medical attention. It is

[31] § 195.402(e).
[32] https://www.phmsa.dot.gov/news/phmsa-announces-new-safety-measures-protect-americans-carbon-dioxide-pipeline-failures

my understanding that no fatalities or overnight hospitalization occurred, which is why PHMSA cited "none" for fatalities and injuries in its investigation.

The pipeline operator associated with this incident was fined approximately $4 million for multiple probable violations of Federal pipeline safety regulations[33], including failing to correct conditions that could adversely affect the safe operation of its pipeline system within a reasonable time. Pipeline operators, including SCS, will take any lessons learned from this incident to further strengthen and enhance safety.

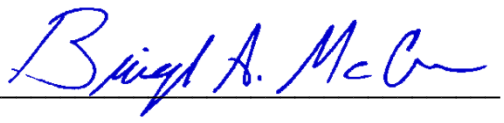
Q. ARE CARBON DIOXIDE PIPELINES SAFE?

A. Yes, absolutely, and after reviewing this project, I believe SCS' pipeline will be one of the safest CO_2 pipelines ever built. I would be fully confident and would have no concerns working or living within proximity of these pipelines.

Q. DOES THIS CONCLUDE YOUR TESTIMONY?

A. Yes

Dated this 1 day of November 2022.



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[33] https://www.phmsa.dot.gov/sites/phmsa.dot.gov/files/2022-05/42022017NOPV_PCO PCP_0526022_%2820-176125%29 - Denbury Pipeline.pdf