

Before the Public Service Commission of
The State of North Dakota

In the Matter of the Application of
DAKOTA GASIFICATION COMPANY
Consolidated Certificate of Corridor Compatibility
and Route Permit for the
Dakota Carbon Pipeline Project

Case No. PU-21-150

July 6, 2021

Witness Tyler Schilke

PURPOSE & DESCRIPTION OF PROJECT DESIGN OF PIPELINE

1. Q. Mr. Schilke, please give us your name, business address and your occupation.

A. My name is Tyler Schilke. I am employed as the Supervisor of Mechanical Engineering by Basin Electric Power Cooperative. My work address is 1717 East Interstate Avenue, Bismarck, North Dakota.

2. Q. What is your employment history with Basin Electric?

A. I have been a Mechanical Engineer at Basin Electric for 14 years. Prior to that I worked for Applied Engineering, Inc. as a Test Engineer for 3 years. Dakota Gasification Company (**DGC**) is a subsidiary of Basin Electric, and thus my work includes working on engineering projects for and on behalf of Dakota Gasification Company.

3. Q. Please state your educational background.

A. I received a Bachelor of Science Degree in Mechanical Engineering from North Dakota State University in Fargo, North Dakota and am a Professional Engineer registered in the State of North Dakota.

4. Q. What have been your responsibilities in connection with the DGC pipeline Project?

A. I am the Project Manager. As Project Manager, I am responsible for coordination of all aspects of the Project including: routing, right-of-way, construction, engineering and permitting.

5. Q. What is the purpose of your testimony at this proceeding?
- A. The purpose of my testimony is to provide a description of the Project, a description of the pipeline, explain its purpose and need and also provide a general explanation of Dakota Gasification Company's efforts to comply with the applicable PSC Transmission Facility Corridor and Route Policy Criteria.
6. Q. Please describe the proposed Project.
- A. The Project or DCP (Dakota Carbon Pipeline) is a carbon dioxide (CO₂) transmission pipeline that originates at the Great Plains Synfuels Plant, in Mercer County and terminates at six individual CO₂ injection well locations. The Project consists of the design, procurement, construction and operation of a 12" diameter mainline pipeline that will be approximately 2.9 miles in length, commencing at a point of interconnection with the existing CO₂ pipeline infrastructure and terminating at a point of interconnection at one of the yet to be constructed CO₂ injection well sites. The five lateral pipelines, totaling 3.9 miles will be constructed with a 6-inch nominal diameter pipeline, each of which originate at the mainline and end at a sequestration well site. Sargent and Lundy, a company with substantial expertise pipeline design and construction, has been retained to provide technical assistance with the project. We anticipate that we will hire a company with expertise in the construction of high pressure pipelines to construct the pipeline and associated facilities.
7. Q. Why is Dakota Gasification Company proposing this project?
- A. The purpose of the Project is to transport carbon dioxide (CO₂) in order to facilitate the geologic storage or sequestration of CO₂. The Project would allow Dakota Carbon Transport Company (DCTC), Dakota Gasification Company (DGC), or Partner to utilize the 45Q tax credits for CO₂ captured by DGC infrastructure while securely storing CO₂ in a geologic (Broom Creek) formation. The geologic storage or sequestration of CO₂ could benefit the state and the global environment by reducing greenhouse gas emissions.

Geologic storage of CO₂ is also expected to help ensure the viability of the state's coal and power industries and to the economic benefit of North Dakota and its citizens.

8. Q. Please generally describe the 45Q tax regulations?
 - A. After nearly three years since enactment of the authorizing legislation, the Internal Revenue Service on January 15, 2021, issued final regulations to implement Section 45Q of the United States (US) tax code. Section 45Q provides a performance-based tax credit for carbon capture projects that can be claimed when a project has securely stored carbon dioxide in a geologic formation, such as an oil field or saline formation. The 45Q tax credit provides incentives for carbon capture projects in multiple industries, much like the role the federal production tax credit and investment tax credit has played in wind and solar projects. With the regulatory certainty provided by the final 45Q regulations, the Project would allow for additional options for CO₂ produced by DGC, including partnering with a third-party in order to utilize the recently enacted 45Q tax credits.

9. Q. Please describe the construction schedule for the proposed Project?
 - A. Dakota Gasification Company is planning to start construction of the pipeline at the end of September and complete the Project in July 2022. Our intent is to begin construction as soon as possible to take full advantage of the fall construction season which will help minimize the additional costs associated with winter construction.

10. Q. What is the estimated cost of the Project?
 - A. The total cost of the Project is estimated to be \$25 million.

DESIGN OF PIPELINE

11. Q. Please describe the design of the CO₂ pipeline that DGC intends to construct?
- A. The pipeline will be designed for a maximum allowable operating pressure, or MAOP, of 2964 psig. The pipeline is designed for a maximum flow rate of 200 million standard cubic feet per day. The combination of pressure and flow rate, in addition to design factors listed in 49 CFR 195, are used to determine the pipe diameter and the pipe wall thickness. The pipeline design also includes cathodic protection for additional protection against pipeline corrosion.
12. Q. What standards has and will DGC employ in the design and construction of the pipeline?
- A. The design and construction of the pipeline will meet or exceed the requirements of 49 CFR 195.
13. Q. Please describe the basic specifications for the pipe that will be used in this Project?
- A. The pipe used in this project will primarily be 12" nominal diameter pipe and 6" nominal diameter for the laterals. This pipe will comply with the American Petroleum Institute Specification 5L, which specifies properties such as material composition and strength. The underground pipe will be coated with fusion bond epoxy, and in locations where the pipe will be installed by means of horizontal directional drilling, an abrasion resistant coating will be applied over the fusion bond epoxy.
14. Q. Would you please describe the associated structures to be built as part of this Project?
- A. Current plans include eight (8) aboveground facilities associated with the project. One (1) aboveground location is on DGC property and is associated

with flow control, metering, and pig launching for the 12-inch mainline. One (1) aboveground location is adjacent to Well Site 3 and is associated with pig receiving for the 12-inch mainline and for metering, electrical, and communications equipment upstream of the well head at Well Site 3. Five (5) of the aboveground facilities are for metering and communications equipment at the CO₂ upstream of the well head at each of the five other injection well sites. One additional aboveground site is necessary to accommodate the lateral line from the mainline to Well Site 1. All components installed aboveground simplify maintenance, operations, and inspections. A chain link fence and a building to house the electrical, instrumentation, control, and communications equipment would also be installed at each site. Additional detail regarding aboveground facilities is provided below.

The 12-inch mainline will originate on the DGC GPSP site where it will be connected to an existing 12-inch compressed CO₂ header. The primary aboveground Project components at the GPSP site, listed in the order of flow direction, include a flow meter, a flow control valve, a motor operated block valve, and a pig launcher. In addition to the block valve, additional manual isolation valves will be installed to facilitate operations and maintenance activities. The pipeline would transition to below ground installation prior to exiting the plant site. A station would be constructed along the mainline approximately 1.6 miles north of the plant site to provide an aboveground location to begin the 6-inch lateral line to Well Site 1.

A pig receiver station would be constructed at the end of the 12-inch mainline and adjacent to one of the six sequestration well sites (Well Site 3) located approximately 2.7 miles north of the plant site. The primary aboveground Project components at the pig receiver station, in the order of flow direction, would be a pig receiver, a header with five 6-inch motor operated block valves (one for each 6-inch branch line supplying CO₂ to each of the five well sites), and a flow meter skid for the adjacent well site. In addition to the block valves, additional manual isolation valves will be installed to facilitate operations and maintenance activities.

Aboveground facilities would also be constructed at the end of each 6-inch lateral line and adjacent to the associated sequestration well site. The primary piping component at each well site station is a flow meter skid. In addition to the flow meter skid, manual isolation valves will be installed to facilitate operations and maintenance activities.

15. Q. Mr. Schilke, please generally describe the phases in which construction of the pipeline will proceed and what each of those phases will entail.

A. Construction of the proposed pipeline would follow industry-standard practices and procedures, which involve a series of discrete activities conducted in a linear sequence. Prior to construction, a survey crew would stake the pipeline centerline and the limits of the construction ROW and ATWS areas. Wetland boundaries and other environmentally sensitive areas also would be marked at this time. DGC's construction contractor may need to cut and brace fences along the ROW if necessary for the pre-construction survey.

Prior to ground-disturbing activities, DGC's construction contractor would coordinate with the North Dakota One-Call system to have existing underground utilities identified and flagged. A clearing crew then would clear the work area of vegetation and other obstacles, including trees (as necessary), stumps, logs, brush, and rocks. To the extent feasible, DGC would minimize tree removal during construction. Cleared vegetation and stumps would be transported offsite to a permitted disposal facility.

Following clearing, the construction ROW and ATWS areas would be graded where necessary to provide a level work surface. Topsoil would be segregated for use in reclamation, as appropriate. If the ground is relatively flat and does not require grading, rootstock may be left in the ground to facilitate revegetation of the ROW. In areas disturbed by grading, temporary erosion and sediment controls would be installed within the ROW to minimize erosion. These erosion and sediment controls would be inspected and

maintained throughout the construction and restoration phases of the Project.

Individual sections of pipe would be trucked to the construction ROW and strung along the trench in a single, continuous line. The pipe would be bent, where necessary, to allow for a uniform fit with the contours at the bottom of the trench. Typically, a track-mounted, hydraulic pipe-bending machine would tailor the shape of the pipe to conform to the contours of the terrain. After the pipe sections are bent, they would be welded together into long sections and placed on temporary supports. Welding would be conducted in compliance with Title 49 CFR Part 195 and American Petroleum Institute Standard 1104 Welding of Pipelines and Related Facilities. Completed welds would be visually and non-destructively inspected, and all pipe welds would be coated in accordance with required specifications. The coating would be inspected for defects, and repaired, if necessary, prior to lowering the pipe into the trench.

Trenching would be conducted with rotary trenching machines, track-mounted backhoes, or other similar equipment. Crossings of any roads, railroads, wetlands, or waterbodies would be accomplished using the HDD method, which allows for trenchless construction across an otherwise sensitive area.

Trench spoil would be deposited adjacent to the trench within the construction ROW and adjacent to the topsoil pile. In areas where only topsoil segregation method is proposed, DGC's contractor would stockpile excavated topsoil and subsoil in separate piles directly on a sod mat to prevent stockpiled subsoil from mixing with underlying topsoil. In open lands, the sod mat would provide an adequate buffer between the stockpiled spoil and underlying topsoil.

The trench would be excavated to a depth that provides sufficient cover over the pipeline after backfilling, and would also meet the requirements of USDOT's PHMSA as specified in CFR Part 195. Typically, the trench would be excavated to a depth of about 5 feet to allow for a minimum of 4 feet of cover over the pipeline, or any associated appurtenances, after construction.

Additional cover would be provided at road crossings, railroad crossings, and waterbody crossings.

Prior to lowering-in, the trench would be inspected to ensure it is free of rocks and other debris that could damage the pipe or its protective coating. The pipe would then be lifted from the temporary supports and lowered into the trench using side-boom tractors. After lowering-in, the trench would be backfilled with previously excavated materials using bladed equipment or backhoes. If the excavated material is rocky, the pipeline would be protected with a rock shield or covered with more suitable fill. Clean fill would be obtained by removing rock from the excavated spoil. Topsoil would not be used to pad the pipe. Previously graded areas would be returned to original contours as near as practicable, with the exception of areas requiring access for remaining construction activities (e.g., for restoration in the spring or summer of 2022).

After backfilling, the entire pipeline would be hydrostatically tested in sections to ensure that the system is free from leaks and would provide the required margin of safety at operating pressures. The testing medium would be a filtered water supply and would be obtained from local suppliers and trucked to the ROW in accordance with state regulations and any required transportation permits. Internal test pressures and durations would be in accordance with Title 49 CFR Part 195 and applicable permit conditions. If leaks are found, the pipe will be repaired, and the section of pipe will be retested until all required specifications are met. After testing, the hydrostatic test water would be discharged in accordance with applicable requirements.

After hydrostatic testing, the pipeline would be dried and filled with low pressure nitrogen as needed to protect it from corrosion until commissioning, which is scheduled to occur in spring or early summer 2022. Commissioning would involve activities to verify that equipment is properly installed and working, controls and communications systems are functional, and the pipeline is ready for service. The pipelines would be cleaned and dried, and the 12-inch diameter mainline would be inspected to detect anomalies in the

pipe that may have been introduced during construction, and prepared for service by purging the line of air and loading the line with CO₂.

Final cleanup would begin after backfilling and as weather and site conditions permit. During clean-up, construction debris would be collected and taken to a permitted disposal facility. Pre-construction contours along the ROW would be restored to pre-existing conditions as closely as possible. Segregated topsoil would be returned to the stripped areas, and as necessary, permanent erosion controls would be installed. Seeding would be seasonally timed to ensure adequate growth.

Markers showing the location of the pipeline would be installed at fence and road crossings to identify DCTC or DGC as the owner of the pipeline, and to convey emergency information in accordance with applicable government regulations, including USDOT safety requirements.

16. Q. What are the minimum depths at which the pipeline will be buried?
- A. The pipeline will be buried a minimum of four feet deep measured to the top of the pipe and six feet deep at undeveloped section lines.
17. Q. Mr. Schilke, please describe the fundamental factors considered in selection of the corridor and route for the pipeline.
- A. When selecting the corridor and route, we focused on identifying the most direct route to minimize both impacts and costs. The route selected parallels existing linear facilities which minimizes the potential to impact future land development.
18. Q. Please describe the Right of Way needed for the Project?
- A. DGC is proposing a temporary construction width of 75 feet and a permanent ROW width of 50 feet. It is anticipated that by September 1, 2021, DGC will have acquired the necessary easements for the Project.

19. Q. Mr. Schilke, please describe some of the procedures that will be followed before and during construction to ensure safety of construction personnel, members of the general public and the integrity of the pipeline.
- A. The pipe will be inspected and hydro tested at the mill. During construction, inspectors will be on site to verify that the contractor is following the construction specifications and that all work is performed safely. Girth welds will be inspected by x-ray, which is a form of non-destructive examination used to determine the quality of the weld, and in accordance with 49 CFR 195. Before and during backfilling, inspectors will be looking for any rocks in the trench or in the spoil that have the potential to damage the pipeline. After installation, the pipeline will be hydro tested at a pressure 1.5 times the MAOP. After all installation work has been completed, a smart pig will be sent through the 12" line to record the exact installed location of the pipeline and to obtain baseline data, such as pipe wall thickness, to compare against future inspection data.
20. Q. Are you aware of any potential hazards to humans, animal life or the environment posed by the pipeline?
- A. No
21. Q. Please describe generally how the corridor and route selected for the pipeline maximize economy and efficiency.
- A. To maximize economy and efficiency, a pipeline from a point of interconnection on DGC's existing CO₂ line was selected. The route selected was also to most direct route possible while avoiding existing infrastructure and sensitive areas. This resulted in the shortest reasonable pipeline length, which minimizes both impacts and costs. Additionally, the route parallels existing linear facilities on previously disturbed land.
22. Q. Mr. Schilke, based on your knowledge of the Project, do you believe the location, construction and operation of the proposed facilities produce

minimal adverse effects on the environment and upon the welfare of the citizens of North Dakota?

A. Yes

23. Q. Are the proposed facilities compatible with environmental preservation and the efficient use of resources?

A. Yes

24. Q. Will the proposed facility locations minimize adverse human and environmental impact while ensuring continuing system reliability and integrity as well as ensuring that energy needs are met and fulfilled in an orderly and timely fashion?

A. Yes

25. Q. Does this complete your direct testimony?

A. Yes