



PUBLIC EMPLOYEES FOR ENVIRONMENTAL RESPONSIBILITY

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January 31, 2022

Via email to consumer.puc@state.mn.us

Consumer Affairs Office
Minnesota Public Utilities Commission
121 7th Place East, Suite 350
St. Paul MN 55101

Re: In the Matter of a Commission Investigation into Potential Rule Amendments Related to Liquefied Carbon Dioxide, PUC Docket Number: U999/CI-21-847

Dear Consumer Affairs and Commission Staff,

Public Employees for Environmental Responsibility (PEER) is a nonprofit organization that assists federal, state, and local public employees in fighting for the ethical management of natural resources, strong environmental laws and policies, and accountability and transparency in government actions. PEER respectfully submits these comments on the Minnesota Public Utilities Commission's (Commission) above-captioned comment period.

I. Question presented and short answer

Should the definition of "hazardous liquid" in Minnesota Rule 7852.0100, subpart 18, be amended to include liquefied carbon dioxide?

Yes. While the current statutory and regulatory authority of the Commission already covers carbon pipelines as they are currently operated in the U.S., it would be a useful clarification to update the regulation to assert that the Commission has this authority over carbon pipelines. In the regulatory amendment the Commission should recognize its authority to regulate these pipelines both as pipelines that transport a hazardous liquid and a pressurized gas. This rule could be adopted rapidly for "good cause" under existing statute.

II. Analysis

As an initial matter it is important to note that carbon pipelines do not transport "liquefied carbon dioxide" as the question the Commission presented presumes. Instead, carbon transported in a pipeline is pressurized from a gas to a supercritical fluid.¹ Federal regulation of carbon pipelines presupposes that the carbon dioxide is being transported after being "compressed to a

¹ Corrosionpedia, *What is Supercritical Carbon Dioxide?*, <https://www.corrosionpedia.com/definition/6789/supercritical-carbon-dioxide> (last visited Jan. 27, 2022) ("Supercritical carbon dioxide (CO₂) is a fluid state of CO₂ where it is heated and held at or above its critical temperature and pressure.").

supercritical state.”² This supercritical state is not merely a liquid state or a gaseous state, the Department of Transportation’s Research and Special Programs Administration (DOT-RSPA) explained in its 1991 rulemaking on the topic:

Carbon dioxide may exist simultaneously as a gas, liquid, and solid at its triple point which is -69°F and 60.43 [pounds per square in gauge (psig)]. Below the triple point, it may be either a solid or gas depending on temperature and pressure. Dry ice for refrigeration is a common use of CO_2 in solid form. Dry ice at a temperature of -109°F and atmospheric pressure will sublime, that is, pass to the gas phase without going through the liquid state. The critical temperature of CO_2 is 87.8°F . When pressure reaches 1200 psig, CO_2 enters what is called the supercritical phase (also referred to as a dense vapor phase).³

A supercritical fluid is, strictly speaking, neither a liquid nor a gas but has properties of both.⁴ While it may be a supercritical fluid/dense vapor in the pipeline, DOT-RSPA also determined that “in the event of a pipeline rupture, the CO_2 released would flash to a solid or gaseous phase depending upon controlling conditions.”⁵ So a carbon pipeline transports supercritical carbon dioxide, which can be thought of as both a liquid and a gas because it is not confined to one or the other state, and when the pipeline ruptures it will likely create a vapor cloud heavier than air that causes asphyxiation.⁶ The Commission is at liberty to regulate it either as a hazardous liquid or a pressurized gas,⁷ and is required to do so by Minnesota statute as discussed below.

² 49 C.F.R. 195.2 (“Carbon dioxide”), [https://www.ecfr.gov/current/title-49/subtitle-B/chapter-I/subchapter-D/part-195#p-195.2\(Carbon%20dioxide\)](https://www.ecfr.gov/current/title-49/subtitle-B/chapter-I/subchapter-D/part-195#p-195.2(Carbon%20dioxide)).

³ *Transportation of Carbon Dioxide by Pipeline*, 56 Fed. Reg. 26922, 26922 (June 12, 1991), https://archives.federalregister.gov/issue_slice/1991/6/12/26921-26934.pdf. DOT-RSPA went on to explain:

Pipeline transportation of CO_2 in the supercritical phase is more desirable than transportation in the gaseous phase. As a dense vapor in the supercritical state, CO_2 can be transported more economically and efficiently using smaller pipelines and pumps because greater volumes of fluid can be transported as a dense vapor than as a gas. In addition, CO_2 would be difficult to transport as a gas because it would enter into two-phase flow at a lower pressure than that required for the efficient pipeline transportation of the CO_2 .

Id.

⁴ Corrosionpedia, *What is Supercritical Carbon Dioxide?*, <https://www.corrosionpedia.com/definition/6789/supercritical-carbon-dioxide> (last visited Jan. 27, 2022) (“In this supercritical phase, CO_2 exhibits properties and behaviors between that of a liquid and a gas. In particular, supercritical CO_2 possesses liquid-like densities with gas-like diffusivity, surface tension and viscosity.”).

⁵ 56 Fed. Reg. at 26924 (summarizing a comment by the Department of Interior).

⁶ *Id.* at 26922, 26924.

⁷ As discussed in section 2 of the analysis below, because the Commission is limited to regulating hazardous liquid pipelines of a certain diameter, and DOT-RSPA explained “greater volumes of fluid can be transported as a dense vapor than as a gas,” *id.* at 26922, it would be

1. The Legislature already covered carbon pipelines in statute and the Commission cannot create an arbitrary exception in rule

The operative part of Minnesota statutes requiring routing permits for pipelines, Minnesota Statute 216G.02, Subdivision 1, displaces another definition of “pipeline” within the chapter that seems to suggest hazardous liquids only includes “crude petroleum or petroleum fuels or oil or their derivatives, coal, anhydrous ammonia or any mineral slurry.”⁸ The operative routing definition instead covers all “hazardous liquids” so long as the pipeline has a diameter of six inches or more.⁹ At the time that the Commission first promulgated its definitions in 1988 there was no apparent necessity to define “hazardous liquid” as being broader than the short list that itemizes some hazardous liquids that would normally transported by pipeline in Minnesota – that is to say there was no apparent error in Minnesota Rule 7852.0100, subpart 18’s specification of “petroleum, petroleum products, or anhydrous ammonia,” because these were indeed the hazardous liquids that were likely to be transported at the time. There is no reason to believe that Commission staff at the time intentionally excluded coal, mineral slurries, or for that matter carbon dioxide, it appears they were merely taking a practical approach and listing the substances they knew about.

However, in 1991 what was a harmless distinction ripened into a potential ambiguity. This is because in that year federal pipeline authorities responded to a petition from the oil industry asking for federal regulation of carbon pipeline safety.¹⁰ Consistent with the industry’s request DOT-RSPA updated federal law to regulate carbon pipelines similar to hazardous liquid pipelines.¹¹ Since federal authorities determined that carbon pipelines were undoubtedly hazardous and sufficiently similar to existing hazardous liquid pipelines, they agreed with the American Petroleum Institute (API) that it would be appropriate to regulate them under the same standards.¹² Unfortunately at that point Commission staff did not revisit the 1988 definition to

consistent with legislative intent for the Commission to exert authority over all carbon pipelines of any diameter since it appears that supercritical fluid pipelines can both be more dangerous *and* smaller than they would be if they were transporting pressurized carbon dioxide gas.

⁸ Compare Minn. Stat. 216G.01, Subd. 3 (“‘Pipeline’ means a pipeline located in this state which is used to transport . . . crude petroleum or petroleum fuels or oil or their derivatives, coal, anhydrous ammonia or any mineral slurry”), and Minn. Stat. 216G.02, Subd. 1 (“notwithstanding section 216G.01, subdivision 3, ‘pipeline’ means . . .”).

⁹ Minn. Stat. 216G.02, Subd. 1.

¹⁰ While the Commission has authority over pipeline routing, it explicitly does not have authority over pipeline safety, which is the domain of the federal government. See Minn. Stat. 216G.02, Subd. 3(a) (“The rules apply only to the route of pipelines and may not set safety standards for the construction of pipelines.”).

¹¹ See 56 Fed. Reg. at 26922.

¹² *Id.* (“On March 16, 1989, the American Petroleum Institute (API) petitioned the Department to amend part 195 to include the regulation of pipelines that transport CO₂. The recommendations contained in the petition are the product of a task force consisting of representatives of nine companies that own or operate CO₂ pipelines. The API recommended that OPS amend existing part 195 rather than write a new part for CO₂ pipelines only, and RSPA adopted this approach.”)

determine whether or not their regulations were sufficiently broad to cover this new type of hazardous pipeline, should one someday be proposed in Minnesota.

Notably, the federal authorities at DOT-RSPA also made factual determinations that are relevant to the Commission's instant proposed rulemaking. "At normal temperatures and atmospheric pressure, CO₂ is an odorless and colorless gas, not flammable, with a density 1.5 times the density of air. It will not support combustion nor will it sustain life if inhaled."¹³ DOT-RSPA also noted a Congressional committee's concern of "the unique potential for disaster if there were ever a break in a CO₂ pipeline."¹⁴ The House Committee on Energy and Commerce specifically referenced an incident where a "catastrophic release of gas dissolved in Lake Nyos . . . killed 1,700 people" as well as the fact that "the news media characterized the gas as 'toxic,' 'poisonous' and 'lethal' [and s]ubsequent investigation proved the gas was carbon dioxide."¹⁵ The committee therefore concluded "since CO₂ is deadly, CO₂ pipelines should have appropriate Federal safety regulations."¹⁶ Congress's findings are supported by the current knowledge on carbon dioxide, including the fact that it can cause rapid suffocation, dizziness, drowsiness, nervous system damage, and other health harms.¹⁷ In its responses to comments DOT-RSPA also explained that while the Lake Nyos disaster was eight-times larger than an underwater carbon pipeline rupture would likely be, it was nonetheless significant that it caused 1700 deaths and carbon pipeline ruptures under waterways could lead to deaths.¹⁸

Now that the issue has ripened into several projects proposed to cross the state of Minnesota,¹⁹ it is apparent that the Commission cannot argue that the definition of "hazardous liquid" as currently written complies with Minnesota's statutory language. This is because the legislature's operative definition of "pipeline" covers all "hazardous liquids," without reference to a limited list of substances that may be put in such a pipeline. Carbon dioxide is undoubtedly hazardous, and as a supercritical fluid has the properties of hazardous liquids when in a pipeline.

Commission regulations must be updated to account for the fact that there is another form of hazardous pipeline in the offing—the Legislature's apparent intent was to cover all such "hazardous liquids" in pipelines and the Commission cannot artificially limit legal coverage beyond what the Legislature commanded. This is because the Minnesota Court of Appeals has determined that a rule that creates an exception that was not authorized in statute conflicts with

¹³ *Id.*

¹⁴ *Id.* at 26923 (quoting a report from the House Committee on Energy and Commerce).

¹⁵ *Id.*

¹⁶ *Id.*

¹⁷ Companies that sell carbon dioxide as a supercritical fluid and process gas identify all of these dangers and more in Safety Data Sheets accompanying their products. *See, e.g.*, Praxair Safety Data Sheet, Carbon Dioxide, SDS No. P-4574-L, May 2015, <http://mcf.tamu.edu/wp-content/uploads/2016/07/CO2.pdf> (also including increased respiration and heart rate, the risk of explosion, and frostbite); Airgas, Safety Data Sheet Carbon Dioxide, Feb. 12, 2018, <https://www.airgas.com/msds/001013.pdf> (same).

¹⁸ 56 Fed. Reg. at 26924 (responding to a comment from API).

¹⁹ *See* PUC Docket Numbers: 21-836, 21-879, 21-880.

state law and the exception is invalid.²⁰ While the Legislature may have provided an exception from regulation for some pipelines – for example excepting all natural gas pipelines under federal routing authority from state routing²¹ – it has not authorized the Commission to omit certain hazardous liquids through regulatory exceptions.²² Moreover, back in 1988 the Commission did not intentionally exclude carbon dioxide at all, assuming an exception without any express intent on the part of the agency would be a dangerous expansion of Commission authority not in keeping with the governing statute or case law.

2. Existing regulations already cover carbon pipelines as a pressurized gas pipeline that is not subject to federal oversight

Even if the Commission did not undertake the proposed rulemaking, it already has authority and responsibility for carbon pipelines under statute and rule governing pressurized gas pipelines. Minnesota Statute 216G.02, “Routing of Certain Pipelines,” contains the requirement that the Commission promulgate rules that govern the routing of pipelines.²³ That same statute defines “pipeline” as either a “pipe with a nominal diameter of six inches or more that is designed to transport hazardous liquids” or a “pipe designed to be operated at a pressure of more than 275 pounds per square inch and to carry gas.”²⁴ The statute does not define “gas” but the Commission’s regulations define the term as “natural gas, flammable gas, or gas which is toxic or corrosive.”²⁵ This definition is broadly consistent with the Legislature’s apparent intent to regulate compressed gas pipelines in Chapter 216G.²⁶

Consistent with the statute, the Commission’s existing regulations define “pipeline” to include a “pipe designed to be operated at a pressure of more than 275 pounds per square inch and to carry gas.”²⁷ The Commission’s regulations also exclude from routing any natural gas pipeline that is subject to Federal Energy Regulatory Commission (FERC) oversight as a natural gas pipeline.²⁸ Carbon dioxide pipelines are not subject to FERC regulation as a natural gas pipeline.

²⁰ *Stasny by Stasny v. Minnesota Dept. of Commerce*, 474 N.W.2d 195, 198 (1991) (striking down rule that carved out exception from Medicare statute because existing statute’s existing exceptions “reflect[ed] the legislature’s intent to provide different exceptions for the separate requirements imposed under each statutory section . . . [and] did not authorize the Commissioner to carve out an additional exception for persons eligible for Medicare”).

²¹ Minn. Stat. 216G.06; *see also* Minn. R. 7852.0300, subp. 1(J) (excluding interstate natural gas pipelines from state routing, consistent with statute).

²² *See generally* Minn. Stat. 216G.02, Subd. 3 (delineating Commission rulemaking authority, and not including authority for the Commission to create exceptions to the “pipeline” definition).

²³ Minn. Stat. 216G.02, Subd. 3.

²⁴ Minn. Stat. 216G.02, Subd. 1.

²⁵ Minn. R. 7852.0100, subp. 16.

²⁶ *See* Minn. Stat. 216G.01, Subd. 3 (demonstrating an intention to regulate all pipelines “used to transport natural or synthetic gas”).

²⁷ Minn. R. 7852.0100, subp. 25(B).

²⁸ Minn. R. 7852.0300, subp. 1(J) (excluding from regulation “any person that proposes to construct or operate an interstate natural gas pipeline under the authority of the federal Natural Gas Act, United States Code, title 15, section 717, et seq.”).

Carbon pipelines carry “gas which is toxic or corrosive” at a pressure far higher than the limit set by statute and rule. As already discussed above, supercritical carbon is toxic because a rupture would result in a vapor cloud that could suffocate people and animals. As discussed further below, when supercritical carbon dioxide mixes with water it becomes a corrosive acid. When carbon dioxide is converted to a supercritical fluid for transport in a pipeline, it is pressurized to at least 1071 psi at temperatures above 87.9°F (31.1°C).²⁹ Back in 1991 DOT-RSPA similarly found that supercritical carbon dioxide was pressurized in pipelines to 1200–1400 psig.³⁰ It is beyond any reasonable question that supercritical carbon pipelines are “designed to be operated at a pressure of more than 275 pounds per square inch” carrying gas that is toxic and corrosive.

The Commission should take this opportunity to acknowledge that supercritical carbon dioxide pipelines are already regulated under existing rules. It would be an error to create a loophole where carbon dioxide gas can be pressurized to the point that it is either unregulated or less regulated than the Legislature intended.³¹ Indeed, the Legislature was clear that any pipeline carrying gas pressurized above 275 pounds per square inch was covered by Commission routing authority. To the extent that the Commission is considering only regulating carbon pipelines when they are of a diameter of six inches or more, the different standard for “hazardous liquid pipelines,” this would be an exception in the regulations that the Legislature has not allowed.³² In updating the definition of “hazardous liquid” the Commission must make clear that carbon pipelines containing supercritical fluid will be subject to routing permits no matter their diameter, consistent with the Commission’s authority over pressurized gas pipelines.

3. The Commission may opt to make the proposed change through abridged rulemaking because it can demonstrate good cause

Unless the Commission intends to broaden the scope of rulemaking beyond this one definition update, it seems appropriate for rulemaking to proceed under the “good cause” exemption. In Minnesota Statute 14.388 the Legislature has established a system for “good cause exemption” from normal rulemaking formalities when an agency “finds that the rulemaking provisions of this chapter are unnecessary, impracticable, or contrary to the public interest” and when one of four factors are met.³³ Those four factors include rule amendments to: “address a serious and immediate threat to the public health, safety, or welfare”; and “make changes that do not alter the sense, meaning, or effect of a rule[.]”³⁴ The law allows a rule amendment with limited procedure, including submittal to the Office of Administrative Hearings for review and specific notice requirements.³⁵ If adopted to protect public health the rule will be effective for two years,

²⁹ Corrosionpedia, *What is Supercritical Carbon Dioxide?*, <https://www.corrosionpedia.com/definition/6789/supercritical-carbon-dioxide> (last visited Jan. 27, 2022).

³⁰ 56 Fed. Reg. at 26922–23.

³¹ *See supra*, notes 3, 7.

³² At the federal level DOT-RSPA determined that excluding carbon dioxide gathering lines from safety standards would be unjustifiable and contrary to law. 56 Fed. Reg. at 26924.

³³ Minn. Stat. 14.388, Subd. 1.

³⁴ Minn. Stat. 14.388, Subd. 1(1)&(4).

³⁵ Minn. Stat. 14.388, Subd. 1–2.

but if adopted because it does not alter the meaning of the Commission's rules the amendment would be permanent.³⁶

The Commission should consider adopting the amendment it proposed in this comment period through the good cause exemption. At the point that the Commission has received two rounds of comments in March it will have heard from all interested parties and received all the comments they are likely to make on any rulemaking offered by the Commission. Therefore, it would be unnecessary to make all the commenters resubmit their positions when the Commission is only contemplating a simple clarification of one definition in its regulations. Moreover, it would be contrary to the public interest to further delay the rulemaking's effective date while the Commission is confronted with two proposed projects³⁷ that are subject to Commission oversight.

It is sometimes appropriate for an agency to shorten a rulemaking timeline when it has already put out its entire proposal and received comments from all interested parties. In a similar abbreviated rulemaking at the federal level, the Environmental Protection Agency (EPA) recently skipped a draft rule phase of rulemaking and went directly to the announcement of a final rule when its original comment opportunity already signaled the substance of the final rule. EPA explained:

Having previously published the rationale for the decision to grant these petitions and provided an opportunity for public review and comment, the EPA has determined that there is good cause for amending the [Clean Air Act Hazardous Air Pollutants] list without additional need for public review and comment. This final rule merely codifies a decision that was made in the June 2020 granting notice; therefore, we believe any additional public notice and comment is duplicative, unnecessary, and would serve no useful purpose.³⁸

Exactly the same as EPA's situation, it would be duplicative, unnecessary, and serve no useful purpose for the Commission to undertake a full rulemaking procedure simply to change one definition to clarify existing state law. This is especially true after a robust notice and comment period on the question of whether this exact amendment is called for.

Consistent with the statute, two of the good cause factors are present here. First, carbon pipelines that evade regulation pose "a serious and immediate threat to the public health, safety, or welfare." As the federal government and scientific literature prove, these pipelines can cause death and serious injury, requiring careful routing to avoid potentially dangerous sites where

³⁶ Minn. Stat. 14.388, Subd. 1 ("Rules adopted, amended, or repealed under clauses (1) and (2) are effective for a period of two years from the date of publication of the rule in the State Register. Rules adopted, amended, or repealed under clause (3) or (4) are effective upon publication in the State Register.").

³⁷ See PUC Docket Numbers: 21-836, 21-879, 21-880.

³⁸ *Clean Air Act Section 112 List of Hazardous Air Pollutant: Amendments to the List of Hazardous Air Pollutants (HAP)*, 87 Fed. Reg. 393, 394 (Jan. 5, 2022), <https://www.federalregister.gov/d/2021-28315/p-14>.

pipes could be punctured or people could be put at risk. Aside from the risk of death and severe injury from inhaled carbon dioxide, it is also concerning that supercritical carbon dioxide becomes carbonic acid when it mixes with water.³⁹ This is corrosive to metal equipment⁴⁰ and can have additional environmental impacts when acidified water spreads in the environment and kills aquatic life and potentially irrigated crops.

The second good cause factor that is present is that this amendment would “make changes that do not alter the sense, meaning, or effect of a rule.” As discussed above, the Commission’s existing regulations already cover carbon pipelines as pressurized gas pipelines and the hazardous liquid authority under statute also encompasses carbon pipelines. Therefore, the rules already fully regulate these projects and require a Commission routing permit before they can be undertaken. While the Commission now proposes to clarify that supercritical carbon dioxide is also a hazardous liquid under the rules, this in no way changes the effect of the rule—projects are subject to the same standards whether or not the Commission undertakes this rulemaking. As such, the Commission has good cause to adopt this amendment quickly under the existing good cause exemption from the full rulemaking process.

Of course, if the good cause exemption results in a rule amendment that only lasts two years the Commission may opt to initiate a full rulemaking at a later date so that the change in the definition of “hazardous liquid” could be made permanently, not subject to a sunset. Such a rulemaking would be a good opportunity to update other parts of the rules for hazardous liquid/ gas pipeline routing in keeping with lessons learned and best practices from other states. But based on the Commission’s noticed question about changing just one definition, it seems that there is good cause to adopt a new definition rapidly under Minn. Stat. 14.388.

III. Conclusion

For the reasons stated above the Commission should update its definition of “hazardous liquid” in Minnesota Rule 7852.0100, subpart 18, to clarify that carbon dioxide pipelines are hazardous liquid pipelines subject to full Commission oversight. This is consistent with the Legislature’s command to the agency to oversee the routing of hazardous liquid pipelines and pressurized gas pipelines. Since there is an immediate public health and safety reason to update this rule, and because it is only a clarification of existing authority, this could be done under a good cause exemption, but permanently changing the relevant definition may also eventually require a renewed rulemaking.

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³⁹ Corrosionpedia, *What is Supercritical Carbon Dioxide?*, <https://www.corrosionpedia.com/definition/6789/supercritical-carbon-dioxide> (last visited Jan. 27, 2022).

⁴⁰ *Id.*