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**VIA Email and [www.regulations.gov](http://www.regulations.gov)**

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**RE: Comments Objecting to the Approval of the Environmental Assessment  
for Proposed Special Permit SP 20534, Docket PHMSA-2019-0100.**

Dear Associate Administrator Schoonover:

Earthjustice, on behalf of the League of United Latin American Citizens Florida ("LULAC"), Delaware Riverkeeper Network, Center for Biological Diversity, Mountain Watershed Association, Clean Air Council, and Sierra Club submits these comments opposing Energy Transport Solutions' Special Permit SP 20534, Docket PHMSA-2019-0100 and the associated Environmental Assessment ("EA"). LULAC is a nonprofit organization dedicated to advancing civil rights for Latinx residents in the United States. The Delaware Riverkeeper Network, Center for Biological Diversity, Mountain Watershed Association, Clean Air Council, and Sierra Club are nonprofit organizations that are dedicated to protecting the environment and devoted to the general purposes of conservation of natural resources. We submit the following comments to raise concerns about the inadequacies of the EA when it pertains to safety, risks, and significant environmental impacts.

The Department of Transportation's Pipeline and Hazardous Materials Safety Administration ("PHMSA") EA is completely inadequate and PHMSA cannot rely on this assessment to determine the safety of the proposed Special Permit. The Special Permit seeks to authorize the transportation in commerce of methane, refrigerated liquid

(liquefied natural gas or “LNG”) in DOT specification 113C120W tank cars. The EA cannot stand for the following reasons:

- I. The Environmental Assessment is inadequate and a full Environmental Impact Statement is needed to address public safety and risks challenges of rail transport of methane, refrigerated liquid in populated areas.
- II. The Environmental Assessment fails to analyze greenhouse gas emissions and climate impacts of the proposed Special Permit and thus violates PHMSA’s duty under the National Environmental Policy Act.

We strongly urge PHMSA to deny the Special Permit application given the fact that a rulemaking process is needed to allow the transportation of LNG via rail, or at the very least, conduct a full Environmental Impact Assessment (“EIS”) to correct the inadequacies and legal errors of this EA and reconsider its conclusions on the basis of the corrected information.

#### BACKGROUND

The Hazardous Materials Transportation Act was created to “protect against the risks to life, property, and the environment that are inherent in the transportation of hazardous material in intrastate, interstate, and foreign commerce.”<sup>1</sup> Because transporting designated hazardous material in commerce in a particular amount and form may pose an unreasonable risk to health and safety or property, proceedings to prescribe regulations for safe transportation must be conducted under the Administrative Procedure Act (“APA”) rule making process.<sup>2</sup>

PHMSA is the agency in the United States Department of Transportation that regulates safety standards in transporting hazardous materials.<sup>3</sup> It is responsible for “[a]dministering a national program of safety, including security, in multi-modal hazardous materials transportation including identifying hazardous materials safety concerns, developing uniform safety standards, and promulgating and enforcing safety and security regulations.”<sup>4</sup> For adding, amending, or deleting regulations, PHMSA uses informal rulemaking procedures under the APA.<sup>5</sup> Generally, they need to publish the

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<sup>1</sup> 49 U.S.C. § 5101.

<sup>2</sup> 49 U.S.C. § 5103.

<sup>3</sup> See 49 C.F.R. Pts. 100-185.

<sup>4</sup> 49 C.F.R. § 1.96.

<sup>5</sup> 49 C.F.R. § 106.10.

following rulemaking documents in the Federal Register: (1) an advance notice of proposed rulemaking; (2) a notice of proposed rulemaking; (3) a final rule; (4) an interim final rule; (5) a direct final rule.<sup>6</sup>

On February 2, 2017, the Association of American Railroads (“AAR”) submitted to PHMSA a “Petition for Rulemaking to Allow Methane, Refrigerated Liquid to be Transported in Rail Tank Cars” pursuant to 49 C.F.R. § 106.100, which establish the rulemaking petition process.<sup>7</sup> In this petition for rulemaking, the AAR described that there is a commercial interest in transporting LNG by rail from Pennsylvania to New England, and between U.S. and Mexico.<sup>8</sup> They argued correctly that the “[a]uthorization of transportation of LNG by rail requires amendment of the Hazardous Materials Table in 49 C.F.R. section 102” and the amendment of “section 173.319 to include specific requirements for DOT-113 cars used for the transportation of LNG.”<sup>9</sup>

A week later, on February 9, 2017, PHMSA acknowledged the receipt of AAR’s petition and assigned the Petition Number P-1697, but did not initiate a rulemaking process.<sup>10</sup> On May 15, 2017, the Center for Biological Diversity (“CBD”) submitted a letter to PHMSA to request AAR’s petition to be denied, or at the very least, that PHMSA fully comply with the National Environmental Policy Act (“NEPA”), 42 U.S.C. § 4342, the Hazardous Materials Transportation Act (“HMTA”), 29 U.S.C. § 5101, and the Administrative Procedure Act (“APA”), 5 U.S.C. § 553.<sup>11</sup> It was not until May 7, 2018 that PHMSA answered both letters. While PHMSA responded to CBD that their comments “will be considered in the ongoing analysis, as well as any future potential rulemaking

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<sup>6</sup> *Id.*

<sup>7</sup> See Robert E. Fronczak, AAR, Petition for Rulemaking to Allow Methane, Refrigerated Liquid to be Transported in Rail Tank Cars, <https://www.regulations.gov/document?D=PHMSA-2017-0020-0002> (last visited Aug. 7, 2019).

<sup>8</sup> *Id.*

<sup>9</sup> *Id.*

<sup>10</sup> See Letter from Steven Andrews, Transportation Regulations Specialist, PHMSA, to Robert E. Fronczak, Asst. Vice President, AAR (Feb. 9, 2017), <https://www.regulations.gov/document?D=PHMSA-2017-0020-0001>.

<sup>11</sup> See Letter from Emily Jeffers, Center for Biological Diversity, Comments to Dkt. No. PHMSA-2017-0020 (May 15, 2017), <https://www.regulations.gov/document?D=PHMSA-2017-0020-0003>.

action,”<sup>12</sup> PHMSA made a determination under 49 C.F.R. § 106.105, that AAR’s petition “merits consideration in a future rulemaking.”<sup>13</sup>

Meanwhile, on August 17, 2017, Energy Transport Solutions, LLC (“ETS”) submitted a Special Permit application (SP20534) to PHMSA for the transportation of methane, refrigerated liquid (UN1972), commonly known as Liquefied Natural Gas (“LNG”) in DOT-113C120W and DOT 113C140W rail tank cars, even though the applicant acknowledged that LNG is not authorized by law for transport by rail in tank cars.<sup>14</sup> ETS seeks to transport LNG in approximately 50-100 cars in two unit trains per day through different regions in the United States that the public does not know since that information was redacted from the application.<sup>15</sup>

On June 6, 2019, PHMSA announced the availability for public review and comments of the draft EA for the Special Permit 20534.<sup>16</sup> The agency only provided a 30-day public comment period, which was insufficient to provide informed comments on such a profoundly dangerous activity. After multiple requests for extensions of time, including Earthjustice’s letter on July 3, 2019, and a letter from Representative Peter DeFazio, Chairman, House Committee on Transp. & Infrastructure, & Representative

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<sup>12</sup> See Letter from Steven Andrews, Transportation Regulations Specialist, PHMSA to Emily Jeffers, Center for Biological Diversity (May 7, 2018),

<https://www.regulations.gov/document?D=PHMSA-2017-0020-0004>.

<sup>13</sup> See Letter from Shane C. Kelley, Director, Standards and Rulemaking Division to Robert E. Fronczak, Asst. Vice President Environment and Hazmats, AAR, to, PHMSA (May 7, 2018),

<https://www.regulations.gov/document?D=PHMSA-2017-0020-0005>.

<sup>14</sup> See Energy Transport Solutions (ETS) Application for SP 20534 to Transport Methane, Refrigerated Liquid in DOT 113 Tank Cars (Aug. 21, 2017),

<https://www.regulations.gov/document?D=PHMSA-2019-0100-0941>.

<sup>15</sup> *Id.*

<sup>16</sup> See Hazardous Materials Safety: Notice of Availability of the Draft Environmental Assessment for a Special Permit Request for Liquefied Natural Gas by Rail 84 Fed. Reg. 26,507 (June 6, 2019),

<https://www.regulations.gov/document?D=PHMSA-2019-0100-0002>.

Tom Malinowski, Member of Congress, to Howard Elliot, Administrator, PHMSA,<sup>17</sup> the agency extended the comment period for 30 more days, until August 7, 2019.<sup>18</sup>

ETS intends to ignore the rulemaking process by invoking the Special Permit provisions under 49 U.S.C. § 5117 and 9 C.F.R. § 107.105 (d). An application under these provisions must demonstrate that a special permit achieves a level of safety at least equal to that required by regulation, or if a required safety level does not exist, is consistent with the public interest.<sup>19</sup> Special permit is defined as “a document issued by the Associate Administrator, the Associate Administrator's designee, or as otherwise prescribed in the HMR, under the authority of 49 U.S.C. § 5117 permitting a person to perform a function that is not otherwise permitted under subchapters A or C of this chapter, or other regulations issued under 49 U.S.C. § 5101 (e.g., Federal Motor Carrier Safety routing requirements).”<sup>20</sup>

Pursuant to the Executive Order on Promoting Energy Infrastructure and Economic Growth issued April 10, 2019, the Department of Transportation (“DOT”) is required to begin the rulemaking process for LNG transport by rail. The Executive Order requires the Secretary of Transportation to propose for notice and comment a rule that would treat LNG the same as other cryogenic liquids and permit LNG to be transported in approved rail tank cars. The Executive Order mandated that the rulemaking process be initiated with 100 days of the April 10, 2019 order. Therefore, this Special Permit application is premature given that the DOT could propose, any day now, a rule to govern the very issue that the Special Permit is meant to address. Such a conflict would greatly impede the ability of the public to adequately comment on these issues of significant public importance.

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<sup>17</sup> See letter from Peter DeFazio, Chairman, House Committee on Transp. & Infrastructure, & Tom Malinowski, Member of Congress, to Howard Elliot, Administrator, PHMSA (June 28, 2019) <https://transportation.house.gov/news/press-releases/as-trump-administration-attempts-to-fast-track-authorization-to-move-lng-by-rail-tank-car-chair-defazio-rep-malinowski-call-on-phmsa-to-disclose-risks-to-public-and-extend-public-comment-period->.

<sup>18</sup> See Hazardous Materials Safety: Notice of Availability of the Draft Environmental Assessment for a Special Permit Request for Liquefied Natural Gas by Rail 84 Fed. Reg. 32, 831 (July 9, 2019) <https://www.regulations.gov/document?D=PHMSA-2019-0100-0938> (extending comment period until Aug. 7, 2019).

<sup>19</sup> See 49 U.S.C. § 5117; 9 C.F.R. § 107.105 (d).

<sup>20</sup> 49 C.F.R. § 107.1.

## ARGUMENT

PHMSA's Environmental Assessment cannot support the Special Permit application and does not comply with the National Environmental Policy Act (NEPA), 42 U.S.C. § 4332. For the following reasons, we respectfully request that PHMSA deny the Special Permit, or at the least, conduct a full EIS and fix the flaws identified below.

**I. The Environmental Assessment is inadequate and a full Environmental Impact Statement is needed to address public safety concerns and the risks and challenges posed by rail transport of liquefied natural gas ("LNG") in populated areas.**

PHMSA in exercising its authority must comply with NEPA, and its implementing regulations, which require that all federal agencies include an environmental impact statement ("EIS") "in every recommendation or report on . . . major Federal actions significantly affecting the quality of the human environment." 42 U.S.C. § 4332(2)(C); *see also* 40 C.F.R. § 1508.11. To determine whether an EIS is necessary, an agency first prepares an environmental assessment ("EA"), 40 C.F.R. § 1508.9, which must include, among other information, a discussion of "the environmental impacts of the proposed action," *id.* § 1508.9(b). After preparing an EA, an agency may conclude that the proposed action would have no significant impact ("FONSI" for a "finding of no significant impact") in lieu of issuing an EIS. *Id.* §§ 1508.9(a)(1), 1508.13. Here, PHMSA generated an EA, which included a finding of no significant impact.

Through this EA, ETS and PHMSA would allow an unprecedented, abrupt opening of the United States mainline rail system to long, heavy, hard-to-handle unit trains of LNG, using a 50-year-old rail tank car design (DOT-113C120W), which has never before been authorized for LNG service. A full EIS is needed to address what the United States Federal Railroad Administration ("FRA") has termed the "uniquely challenging" public safety aspects of LNG rail transport in populated areas. *Millar Aff.* ¶ 7. The EIS must also address the likely upstream and downstream impacts of rail LNG, including the fracking of natural gas, the new terrorism vulnerabilities posed by urban routing of LNG trains, the risks of methane leakage, and the impact on climate change. *Millar Aff.* ¶ 9.

The current EA lacks a compelling supply-demand analysis showing strong demand for near-term rail shipment of LNG. There seems to be no compelling need for PHMSA to be moving so quickly on the issuance of a nationwide Special Permit for LNG transport by 70 plus units (EA at 3) of rail tank cars, in the absence of reasonably

supporting agency research and development actions in the public safety arena. Millar Aff. ¶ 12.

In order for there to be an adequate EIS, the agency research and development actions needed include:

- a new federally-approved LNG-specific tank car design that meets modern safety standards;
- rigorous agency testing of either the existing 50-year-old DOT-113 tank car and/or a proposed new design tank car for survivability in derailment conditions, fire impingement, and collision forces;
- evaluation of the railroads' average 100-car-plus unit train business model which has proved highly risky in triggering the recent 2012-2015 North American trauma of numerous crude oil unit train derailments and is now proposed for LNG by rail; and
- adequate consideration of mandating LNG train major safety conditions, including protective urban rerouting, odorization of the cargo, and restrictions on train length and speed.

Overall, cryogenic LNG loss-of-containment transportation releases involve serious risks of cold embrittlement of nearby structures and surfaces, fire radiation from high and unquenchable gas cloud fires, and offsite travel downwind of flammable and explosive LNG vapor clouds. *See* EA at 7. Even without serious loss of containment, LNG containment vessels are subject to overheating and consequent Boiling Liquid Expanding Vapor Explosions (BLEVE), as seen in two recent Spanish LNG truck BLEVE accidents, which surprised many LNG experts who had thought such events physically impossible. Millar Aff. ¶ 22.

**A. There is Great Public Concern for Potential LNG Disasters Based on the Regional Pilot Programs.**

As is evident from just the comments in this docket alone, there is grave public concern regarding the potential for LNG disasters. In recent decades worried at-risk residents in many U.S. coastal locations have decisively defeated various LNG import facility siting proposals largely because of testimony by gas scientists on protective distance issues. These scientists, including Dr. James Fay and Dr. Jerry Havens, have

underscored the significant fire radiation risks posed by transporting LNG for communities within 2-3 miles of LNG transport, often LNG marine shipping routes.<sup>21</sup>

Additionally, there has been a lack of public information provided regarding the two LNG by rail pilot programs in Alaska and Florida. These pilot programs have been in operation since 2016 when permitted by FRA. Important Florida East Coast Railway technical documents demanded by FRA have been withheld from residents who filed Freedom of Information Act (“FOIA”) requests in 2018 and 2019. Of utmost importance to the FOIA requesters is the 2016 Florida East Coast Rail Quantitative Risk Assessment (“QRA”) on LNG rail operations in Florida, authored by Exponent consultants. This document was provided to FOIA requesters, but nearly completely redacted. Millar Aff. ¶¶ 28, 86-94, Exhibit E.

These pilot programs were hastily approved. In fact, in a FRA letter dated March 3, 2016, to Florida East Coast Railway,<sup>22</sup> the FRA expressed concern about transporting LNG over routes that traverse Florida’s congested, highly populated coastal areas, with scores of often traversed highway-rail grade crossings that involve many pedestrian deaths each year. FRA here also noted that any LNG transported along the proposed routes would share the routes with high-speed performance passenger trains, such as the Brightline (now VirginRail), which travel at top speeds of 79 mph and are projected to soon travel at speeds up to 110 mph. The top speed for the LNG transport on this line is 40 mph. Millar Aff. ¶ 30. Natural gas is presently liquefied at the American LNG Hialeah Facility, located on the Northern portion of Hialeah Railyard in Medley, FL, and transported via Florida East Coast Railway lines to Port Everglades and Port Miami for export.<sup>23</sup>

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<sup>21</sup> See generally Congressional Research Service, *Liquefied Natural Gas (LNG) Import Terminals: Siting, Safety, and Regulation*, Dec. 14, 2019, <https://www.everycrsreport.com/reports/RL32205.html>; 60 Jerry Havens, *LNG: Safety in Science*, Bulletin of the Atomic Scientists, 30-31 (Jan./Feb. 2004), <https://journals.sagepub.com/doi/full/10.2968/060001010>; Jerry Havens, Comment to Coast Guard Dkt. No. USCG-2004-19615 (Aug. 22, 2005), available at <https://www.regulations.gov/document?D=USCG-2004-19615-0091>; James A. Fay, *Model of Spills and Fires from LNG and Oil Tankers*, B96 J. of Hazardous Materials 171-188 (2003); James A. Fay, *Spills and Fires from LNG and Oil Tankers in Boston Harbor*, (2003). see also Millar Aff. ¶ 25.

<sup>22</sup> The Florida East Coast Railway is a Class II regional railroad that owns 351 miles of mainline track between Jacksonville and Miami. Florida East Coast Railway, *About the Company* (last visited July 15, 2019), <https://fecrwy.com>.

<sup>23</sup> Ann Henson Feltgen, *Despite ‘disaster risk’ Trains Haul Highly Flammable Gas Cargo Across South Florida*, Miami Herald (Aug. 23, 2018), <https://www.miamiherald.com/latest->



Contrary, to long-expressed Congressional, scientific, and public concerns, PHMSA's draft EA abruptly proposes to bring LNG transportation disaster risks directly by mainline and short line U.S. rail carriers through virtually all major U.S. cities. This effectively *obliterates* the notion of protective distance, which the EA backhandedly concedes in its unfounded assertion that rail transportation is safer than truck transportation because the latter is allegedly in closer "proximity" to populations. Millar Aff. ¶ 32.

### **B. There is a Serious and Dangerous Lack of Scientific Research Related to LNG Transportation via Rail.**

There is no specific data on LNG bulk rail shipments because LNG has long been "forbidden" except by special permit from the FRA. The EA does not mention the history of any exceptions granted to the ban. Certainly, LNG has been "forbidden" because of the unique and challenging risks that exist in transporting LNG by the U.S. railroads.<sup>24</sup> Millar Aff. ¶ 26.

The EA analyzes whether transportation of LNG in DOT-113C12W tank cars is appropriate and safe, by reviewing past performance of DOT-113s in general, which are used to transport cryogenic materials. EA at 7. Currently, the transportation of ethylene, a cryogenic flammable gas is authorized for DOT-113C120W rail cars. EA at 7. PHMSA has collected data on the safety history of DOT-113 from its incident database and from AAR, which compiles data provided by FRA. PHMSA has therefore analyzed data regarding DOT-113 damage history. Millar Aff. ¶ 33.

From 1980 to 2017, there were 14 instances of damage to DOT-113 tank cars during transportation. EA at 7. According to the EA, of these 14 instances, there were two times where a DOT-113 lost lading from breach of both the outer and inner tanks, which is considered the most serious type of damage. EA at 7. "Additionally, there were four instances in which a DOT-113 lost lading from damage or other failure to the

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[news/article217176680.html](https://www.energy.gov/news/article217176680.html); see U.S. Dep't of Energy Office of Fossil Energy, *American LNG Hialeah Facility Terminal* (last accessed July 15, 2019), <https://www.energy.gov/fe/american-lng-hialeah-facility-terminal>; see also John S. Decker, *Letter to U.S. Dep't of Energy Re: American LNG Marketing, LLC DOE/FE Order No. 3690*, 6 (Mar. 8, 2016), [https://www.energy.gov/sites/prod/files/2016/03/f30/sales%20contract%20Hialeah%20Facility03\\_08\\_16.pdf](https://www.energy.gov/sites/prod/files/2016/03/f30/sales%20contract%20Hialeah%20Facility03_08_16.pdf).

<sup>24</sup> However, the LNG industry maintains it was simply because of no strong demand for bulk LNG by rail. Millar Aff. ¶ 34.

valves/fittings.” EA at 7. The two instances cited by the EA occurred in May 2011, in Moran, Kansas and in October of 2014, in Mer Rouge, Louisiana. These incidents resulted in the total quantity of refrigerated ethylene spilled was 44,306 gallons and refrigerated argon spilled was 47,233 gallons respectively. EA at 7. These two instances cited by PHMSA in the EA, are hardly enough to make up an adequate database to make an informed decision when determining whether to transport LNG by these rail cars. Millar Aff. ¶ 41.

Moreover, PHMSA has conducted more robust research regarding LNG stationary facilities. It is clear that historically, PHMSA believed that more robust research was needed to assess the potentially high-risk releases from fixed LNG facilities, which have traditionally been located at significant distances from populations. There is no justification for how PHMSA has declined to conduct a similar robust risk research effort when it comes to approving LNG by rail. Arguably a similarly, if not more dangerous, activity than LNG stationary facilities. These trains will carry LNG on 100-car units directly through major U.S. cities which are densely populated. Millar Aff. ¶ 44. For example, LNG tank cars are currently passing through areas with 9,500 people per square mile from Hialeah to Port Miami, similarly as the Hialeah to Port Everglades trip.<sup>25</sup>

Additionally, it is not a secret that more information is required for understanding the risks of transporting LNG. PHMSA’s own consultant, David Willauer of Cambridge Systematics, presented “Risk Assessment of Surface Transport of Liquefied Natural Gas” in May 2018, and suggested key federal research and regulatory needs on assessing the safety risks of LNG rail transport.<sup>26</sup>

Furthermore, the EA ultimately concludes that protective distance is needed for LNG disasters, but yet does not adequately address the protective distance required. The EA ultimately underscores the flaws of its public safety arguments by compromising, on the LNG potential release impact distance question. EA at 12. The EA very briefly endorses (with no analysis) the Protective Action Distance guidance for flammable cargoes in the DOT Emergency Response Guidebook (ERG), which is highly revered by the North American fire and emergency services. In its generic, simplified “Orange

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<sup>25</sup> See Jerry Iannelli, *Brightline Tracks Transport Possibly Dangerous Natural Gas Through Miami*, Miami New Times, Aug. 22, 2018, <https://www.miaminewtimes.com/news/florida-east-coast-railroad-ships-liquid-natural-gas-in-miami-10654689>.

<sup>26</sup> Cambridge Systematics, Inc., *Risk Assessment of Surface Transport of Liquid Natural Gas*, Mar. 20, 2019, <https://www.phmsa.dot.gov/sites/phmsa.dot.gov/files/docs/research-and-development/hazmat/reports/71651/fr2-phmsa-hmtrns16-oncall-20mar2019-v3.pdf>; see also Millar Aff. ¶ 91.

Pages” guides for highly flammable gases (including its Guide 115 for refrigerated liquids such as LNG), the current ERG2016 –and previous editions produced by PHMSA every 4 years—provides a widely-used “bible” intended to be used by first responders explicitly only for their initial decisions in the first 20 minutes of a “large spill” of various high-risk chemical cargoes in a transportation emergency.

The ERG’s Guide 115 has long advised first responders to “consider initial downwind evacuation” of half a mile if there is even a single breached refrigerated liquids transportation container with no fire. But if the container is involved in a fire, emergency responders should isolate the scene (prevent entry) for one mile in all directions and also “consider initial evacuation for one mile in all directions.” Millar Aff. ¶¶ 96-97.

Notably, this EA does not consider the public safety implications of this advice regarding some potential need for appropriate safety precautions in the proposed LNG nationwide rail transportation. Moreover, the EA leaves unexamined the question of whether and how this generic ERG guidance is adequate for LNG transportation.

### **C. The EA Could Have Used Existing Gas Models to Estimate LNG Risks and Distance Potentials for LNG Releases.**

Even if PHMSA, in its EA, has been unwilling to estimate distance potentials for an LNG tank car rail release, a multitude of others in government and industry have been using well-known available and approved gas science modeling for estimating the distance consequences of various hypothetical LNG facility and rail car releases. A prominent example of agency and researcher use of gas modeling to assess LNG rail transportation risk exists in the FRA-permitted LNG rail transportation experiment along Florida’s East Coast. The meager EA does not impose any new significant LNG-specific safety conditions in this proposed draft Permit for ETS shipment of LNG by rail, but explicitly relies only on existing federal hazmat regulations regarding generic highly flammable tank car rail carriage. Millar Aff. ¶ 88. The EA has added in—without substantial analysis or even discussion—the voluntary consensus railroad industry minimum standard guidance in AAR Circular OT-55Q. Millar Aff. ¶ 89. This is the latest version of industry’s OT-55, which was introduced many years ago for AAR-member railroad guidance on handling the most dangerous toxic and radioactive rail cargoes, with no consideration of flammable cargo risks. Millar Aff. ¶ 89; EA at 4-5.

In order to set federal actions such as permits and rulemaking, PHMSA could easily adapt and use—with relatively respectable assumptions, but without performing

a full probabilistic QRA – one of the long-approved LNG gas dispersion models (or other models if arguably more adequate) for a set of representative potential LNG rail car releases and publish in an EIS the impact distance results for a selected set of potential LNG rail car releases: pool fires, vapor cloud travel and explosions, and BLEVEs. Millar Aff. ¶ 90.

It is worth noting that the October 2017 ETS QRA was not even available through this Docket for the Special Permit comment period until July 9, 2019. The initial comment period for this Special Permit ended on July 8, 2019. Therefore, it was not until the original comment period closed, that the QRA was available electronically through the PHMSA docket.

**D. The EA Asserts That Rail is Safer than Truck Transportation, While Ignoring the Comparative Risks, as Well as the Potential Terrorism Vulnerabilities.**

Without merit, and in part due to the lack of research, the EA asserts that LNG by rail tank car will be safer than the existing LNG by tank truck. EA at 13. While the EA acknowledges that incidents involving rail tank cars can lead to a larger area of consequences as compared to hazard areas arising from incidents involving MC-338s cargo tank motor vehicles. EA at 13. As the EA also points out, this is because of the larger volume of LNG in each tank car compared to that in a MC-338 cargo tank. EA at 13.

In reality, LNG trucks often travel to liquefaction facilities located in remote areas from remote natural gas mining locations that are not well serviced by pipelines. Millar Aff. ¶ 74. The EA discusses that if it were to deny the Special Permit, ETS would likely continue to ship the LNG via MC-388 cargo tanks on highways. EA at 14. The EA explains that because of the increased amount of trips and higher accident rates for highway traffic as compared to rail traffic, that truck transport poses larger risks than railway travel. EA at 14. However, this conclusion is not meritorious, as the EA in the next sentence, explains that because of the larger quantity of LNG loaded into each rail car, along with the risks that result from multiple LNG railcars moving together, a cascading failure could lead to higher consequences. EA at 14. Therefore, the EA concludes that either option, rail car or truck transportation, can cause injury, death, property destruction, and environmental harm, but that the likelihood of failure is higher for truck transportation, and yet acknowledges that the scope of potential injury and death is greater for rail travel because of higher volumes of LNG carried in each tank car. EA at 14. This conclusion unacceptably declares that rail transport is the safer option.

Additionally, the EA does not discuss the potential for terrorism associated with the transportation of LNG via rail car given the increased amount of LNG per train and the huge potential impacts for death, destruction, and damage to the environment. It has been nearly 18 years since 9/11, and the potential terrorism vulnerabilities still exist for the transport of toxic chemicals.<sup>27</sup> Millar Aff. ¶¶ 76, 80.

**II. The Environmental Assessment fails to analyze greenhouse gas emission and climate impacts of the proposed Special Permit and thus violates PHMSA's duty under the National Environmental Policy Act.**

The EIS must also address the likely upstream and downstream impacts of LNG by rail, including on fracking of natural gas and climate change. The most catastrophic environmental impact of all would be the prolonging of the fossil fuel era with huge LNG investments in North America and worldwide instead of directing those investments to renewable energy resources.

For either an EA or an EIS, the purposes of NEPA require the agency to “consider and disclose” the environmental effects of the actions it certifies. *Baltimore Gas & Elec. Co. v. Nat. Res. Def. Council, Inc.*, 462 U.S. 87, 96 (1983). So long as the agency takes a “hard look” at the environmental consequences, NEPA “does not mandate particular results.” *Robertson v. Methow Valley Citizens Council*, 490 U.S. 332, 350 (1989). NEPA’s “hard look” requires “discussion of the ‘significance’ of [an] indirect effect, see 40 C.F.R. § 1502.16(b) (2018), as well as ‘the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions.’” *Sierra Club*, 867 F.3d at 1374 (internal citation omitted).

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<sup>27</sup> See Richard A. Falkenrath, *Op-Ed: We Could Breathe Easier: The government must increase the security of toxic chemicals in transit*, Wash. Post. (Mar. 29, 2005) (“Of the all the various remaining civilian vulnerabilities, one stands alone as uniquely deadly, pervasive and susceptible to terrorist attack: industrial chemicals that are toxic when inhaled, such as chlorine, ammonia, phosgene, methyl bromide, and hydrochloric and various other acids. These chemicals, several of which are identical to those used as weapons on the Western Front during World War I, are routinely shipped through and stored near population centers in vast quantities, in many cases with no security....A cleverly designed terrorist attack against such a chemical target would be no more difficult to perpetrate than were the Sept. 11 attacks. The loss of life ... might even exceed it... [N]o other category of potential terrorist targets presents as great a danger as toxic industrial chemicals.”)

Indirect effects “are caused by the action and are later in time or farther removed in distance, but are still reasonably foreseeable.”<sup>28</sup> An environmental impact is reasonably foreseeable “if it is ‘sufficiently likely to occur that a person of ordinary prudence would take it into account in reaching a decision.’” *Mid States Coal. for Progress v. Surface Transp. Bd.*, 345 F.3d 520, 549 (8th Cir. 2003) (internal citation omitted). Implicit in this requirement to analyze foreseeable effects is a duty to engage in “reasonable forecasting.” *Scientists’ Inst. for Pub. Info., Inc. v. Atomic Energy Comm’n*, 481 F.2d 1079, 1092 (D.C. Cir. 1973). However, here, PHMSA failed to account for the context and intensity of the upstream and downstream emissions impacts resulting from the activity proposed in the Special Permit.<sup>29</sup>

The indirect effects inquiry is wide-ranging. Specifically, under this standard, courts have required federal agencies to consider the indirect effects of energy-related transportation projects. In *Mid States*, for example, because a new rail line provided a more direct route from coal mines to power plants, the court held that NEPA required the Surface Transportation Board to consider the downstream impacts of burning the coal. *Mid States*, 345 F.3d at 549 (“[I]t is reasonably foreseeable – indeed, it is almost certainly true – that the proposed project will increase the long-term demand for coal and any adverse effects that result from burning coal.”); see also *Border Power Plant Working Grp. v. Dep’t of Energy*, 260 F. Supp. 2d 997, 1030 (S.D. Cal. 2003) (air quality impacts of Mexican power plant that would export electricity to the United States over new transmission line were reasonably foreseeable result of constructing transmission line).

Accordingly, “[t]he impact of greenhouse gas emissions on climate change is precisely the kind of cumulative impacts analysis that NEPA requires agencies to conduct.” *Ctr. for Biological Diversity v. Nat’l Highway Traffic Safety Admin.*, 538 F.3d 1172, 1217 (9th Cir. 2008), citing 40 C.F.R. § 1508.7 (cumulative impact is “the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency ... or person undertakes such other actions”); see also *id.* at 1216 (cumulative impacts analysis inadequate where agency failed to “discuss the actual environmental effects resulting from [greenhouse gas] emissions” (emphasis in original)).

The D.C. Circuit recently ruled in *Sierra Club v. FERC*, 867 F.3d 1357, 1371-1372 (D.C. Cir. 2017), that NEPA required the Federal Energy Regulatory Commission to

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<sup>28</sup> 40 C.F.R. § 1508.8(b); see *New York v. Nuclear Regulatory Comm’n*, 681 F.3d 471, 476 (D.C. Cir. 2012).

<sup>29</sup> 40 C.F.R. § 1508.27.

consider the indirect but reasonably foreseeable impacts of natural gas pipelines which included the downstream greenhouse gas emissions resulting from burning of gas transported by the pipeline in its NEPA review. Although the Commission had claimed that it lacked information regarding the amount of gas that would be burned downstream, the Court found that the agency could “make educated assumptions” about use of gas based on its knowledge of the general capacity of the pipeline. *Sierra Club* at 1374.

Applying *Sierra Club*, federal district courts in other jurisdictions reached similar results. For example, in *San Juan Citizens All. v. U.S. Bureau of Land Mgmt.*, 326 F. Supp. 3d 1227 (D.N.M. 2018), the court rejected BLM’s claim that “consumption is not ‘an indirect effect of oil and gas production because production is not a proximate cause of GHG emissions resulting from consumption’.” *Id.* at 1242. Instead, the court ruled that BLM’s “statement is circular and worded as though it is a legal conclusion...[and] it is contrary to the reasoning in several persuasive cases that have determined that combustion emissions are an indirect effect of an agency’s decision to extract those natural resources.” *Id.*; see also *W. Org. of Res. Councils v. U.S. Bureau of Land Mgmt.*, No. CV 16-21-GF-BMM, 2018 WL 1475470, \*13 (D. Mont. Mar. 26, 2018), *appeal dismissed*, No. 18-35836, 2019 WL 141346 (9th Cir. Jan. 2, 2019) (finding that NEPA requires consideration of environmental consequences of the downstream combustion of the coal, oil and gas resources potentially open to development under agency plan within the NEPA document).

In *San Juan*, the court continued that “it is erroneous to fail to consider, at the earliest feasible stage, ‘the environmental consequences of the downstream combustion of the coal, oil and gas resources potentially open to development’ under the proposed agency action.” *San Juan*, 326 F. Supp. 3d at 1244. Accordingly, the court found that BLM’s action was “arbitrary” due to its failure to estimate the amount of greenhouse gas emissions which will result from consumption of the oil and gas produced as a result of the development of wells in the leased areas. *Id.*; see also *Montana Env’tl. Info. Ctr. v. U.S. Office of Surface Mining*, 274 F. Supp. 3d 1074, 1097-99 (D. Mont. 2017), *amended in part, adhered to in part sub nom. Montana Env’tl. Info. Ctr. v. U.S. Office of Surface Mining*, No. CV 15-106-M-DWM, 2017 WL 5047901 (D. Mont. Nov. 3, 2017); *Dine Citizens Against Ruining Our Env’t v. U.S. Office of Surface Mine Reclamation and Enforcement*, 82 F. Supp. 3d 1201, 1213 (D. Colo. 2015), *Dine Citizens Against Ruining our Env’t v. U.S. Office of Surface Mining Reclamation & Env’t*, 643 F. App’x 799 (10th Cir. 2016).

PHMSA’s analysis of greenhouse gas emissions in the EA violates NEPA in at least three ways. First, PHMSA violated NEPA by failing to analyze the impact of downstream

and upstream greenhouse gas emissions and climate change despite the clear connection between the activities authorized in the proposed Special Permit and the release of greenhouse gases. Second, PHMSA violated NEPA by failing to request any information from the applicant regarding downstream and upstream greenhouse gas emissions. Third, PHMSA violated NEPA by failing to account for, or otherwise examine, the induced development of additional production, transportation, and combustion of natural gas liquids (“NGLs”) as a result of the Special Permit.

There is no doubt that the activities authorized in the Special Permit will result in the combustion of LNGs that will emit significant quantities of greenhouse gases into the atmosphere. Indeed, that is the entire purpose of ETS’s request for the Special Permit. PHMSA states as much in the EA, where they admit that “[i]n most cases . . . the ultimate end-users of this LNG will be foreign generators of power for residential, commercial and industrial purposes,” and that “there will be some domestic end-users of the LNG.” EA at 1. However, in the draft EA, PHMSA failed to analyze the greenhouse gas emission and climate impacts of the activities authorized in the Special Permit. PHMSA does not even attempt to quantify the emissions, let alone examine their context and intensity as required by NEPA. Instead, greenhouse gas emissions are only fleetingly mentioned once with regard to a comparison of train versus truck engine emissions, and even in that context the emissions are not quantified.

In addition to PHMSA’s failure to analyze greenhouse gas emissions and their impacts, PHMSA also failed to perform an even more fundamental task required under NEPA – requesting the relevant data from the applicant. This is a separate but equally dispositive violation of NEPA. Specifically, PHMSA must request information regarding the extent of potential increased domestic production and consumption of methane gas and its environmental impact to comply with NEPA. NEPA “requires the [agency] to at least *attempt* to obtain the information necessary to fulfill its statutory responsibilities.” *Birckhead v. FERC*, 925 F.3d 510, 520 (D.C. Cir. 2019) (emphasis added); *see also Delaware Riverkeeper Network v. FERC*, 753 F.3d 1304, 1310 (D.C. Cir. 2014) (“an agency must fulfill its duties to the fullest extent possible”) (citations omitted). Even if the relevant information is unavailable, the reviewing agency has an affirmative duty to seek it out. *See Barnes v. U.S. Dep’t of Transp.*, 655 F.3d 1124, 1136 (9th Cir. 2011) (“an agency must use its best efforts to find out all that it reasonably can”) (citations omitted).<sup>30</sup>

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<sup>30</sup> *See also* 40 C.F.R. § 1502.16(b).



An example of relevant data is that Marcellus and Utica methane gas production has been limited by pipeline takeaway capacity in the region.<sup>31</sup> However, the U.S. Energy Information Administration (“EIA”) “estimate[d] that if all pipeline projects meet the scheduled service dates, more than 24 billion cubic feet per day (Bcf/d) of takeaway capacity will be online in 2018, up from the estimated 16.7 Bcf/d in 2017”.<sup>32</sup>

Since 2013, when the region’s supply began exceeding demand, producers have been squeezing gas out through any available outbound pipeline capacity in order to access interregional demand. As a result, the Northeast’s gas flow and pricing dynamics have been defined by takeaway constraints, with flows perpetually hitting capacity limits and supply hub prices getting knocked down.<sup>33</sup>

The production of methane gas in the United States “grew by 10.0 billion cubic feet per day (Bcf/d) in 2018, an 11% increase from 2017. The growth was the largest annual increase in production on record, reaching a record high for the second consecutive year.”<sup>34</sup> The U.S. continued to export more methane gas than it imported in 2018, after being a net exporter in 2017 for the first time in nearly 60 years: total methane gas exports grew 14% in 2018, and LNG exports grew by 53%.<sup>35</sup> It has been said that the Appalachian region remained the largest methane gas-producing region in the United States.<sup>36</sup> In fact, Appalachian methane gas “from the Marcellus and Utica/Point Pleasant shales of Ohio, West Virginia, and Pennsylvania continued to grow, with gross withdrawals increasing from 24.2 Bcf/d in 2017 to 28.5 Bcf/d in 2018. Ohio saw the largest percentage increase in gross withdrawals of natural gas, up 34%, in 2018 to 6.5 Bcf/d.”<sup>37</sup>

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<sup>31</sup> *Northeast Natural Gas Pipeline Takeaway Capacity Expected to Increase in 2018*, Pennsylvania State University, May 23, 2018, <https://extension.psu.edu/northeast-natural-gas-pipeline-takeaway-capacity-expected-to-increase-in-2018>.

<sup>32</sup> *Id.*

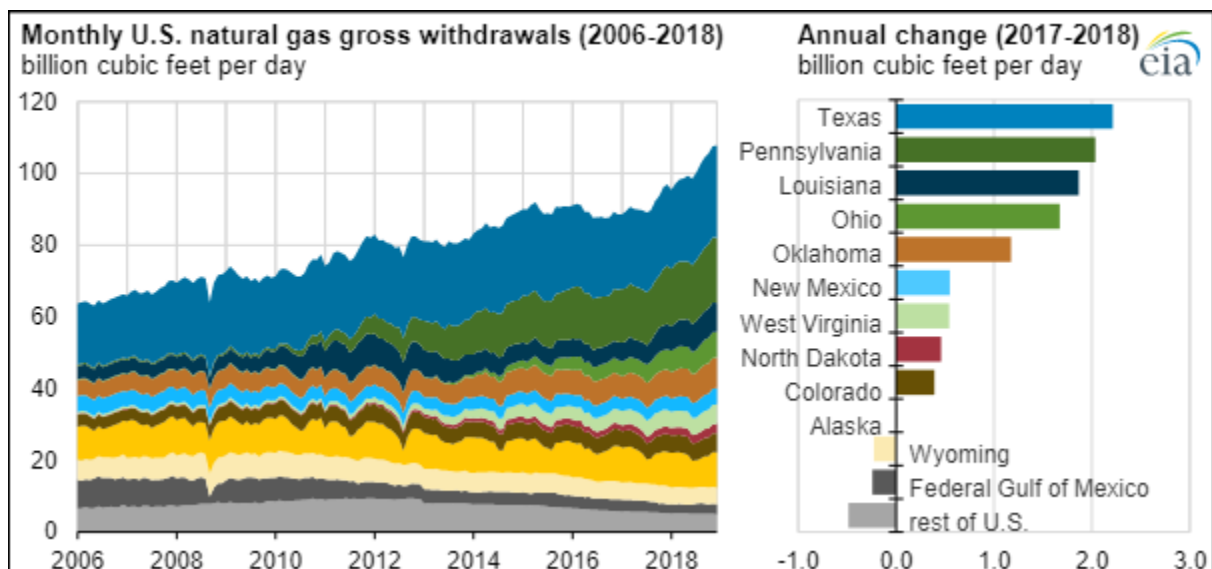
<sup>33</sup> Sheetal Nasta, *Room At The Top, Part 4 – Northeast Gas Takeaway Capacity vs. Production in 2019*, RBN Energy, July 4, 2019, <https://rbnenergy.com/room-at-the-top-part-4-northeast-gas-takeaway-capacity-vs-production-in-2019>.

<sup>34</sup> U.S. Energy Information Administration, U.S. natural gas production hit a new record high in 2018 (Mar. 14, 2019), <https://www.eia.gov/todayinenergy/detail.php?id=38692>.

<sup>35</sup> *Id.*

<sup>36</sup> *Id.*

<sup>37</sup> *Id.*



Source: U.S. Energy Information Administration, [Monthly Crude Oil, Lease Condensate, and Natural Gas Production Report](#).

EIA has reported that over the past several years, methane gas production in the Appalachian basin from the Marcellus and Utica shales has grown significantly.<sup>38</sup> “Because pipeline projects often have longer lead times than production projects, transport infrastructure for accessing natural gas demand centers and export locations in the Appalachian Basin has not kept pace with production capability.”<sup>39</sup> Even though there have been takeaway capacity challenges in the Northeast and particularly in Pennsylvania, because of a lack of available pipelines, as production continues to escalate to record levels.<sup>40</sup>

There is credible information that shows the increase in domestic production and consumption of methane gas. PHMSA has a duty to study the environmental impacts of this increase in production and consumption to comply with NEPA, and failing to do so, undermines its ability to adequately analyze the Special Permit application and EA.

Where a federal agency contended that it was too speculative to reach any conclusions regarding the upstream and downstream emission of greenhouse gases because the applicant was unlikely to have the information, the D.C. Circuit stated it was:

<sup>38</sup> U.S. Energy Information Administration, *New Infrastructure Aims to Increase Takeaway Capacity of Natural Gas from Utica Region*, Nov. 22, 2016, <https://www.eia.gov/todayinenergy/detail.php?id=28872>.

<sup>39</sup> *Id.*

<sup>40</sup> Brian Walzel, *No Signs of Slowing the Marcellus-Utica*, Hart Energy, Sept. 4, 2018, <https://www.hartenergy.com/exclusives/no-signs-slowng-marcellus-utica-31343>.

. . .skeptical of any suggestion that a project applicant would be unwilling or unable to obtain it if the [agency] were to ask for such data as part of the certificate application process. In fact, when we asked counsel for Tennessee Gas during oral argument ‘what would have happened if the [agency] . . . , as part of your application,’ had requested that ‘you . . . ask the shipper/marketer where the gas is coming from,’ he replied that the company ‘would have gone to [the shipper] and posed the question.’ [] ‘When the regulator asks us questions,’ counsel explained, ‘we generally answer them as promptly as possible and as completely as possible.’ *Birckhead*, 925 F.3d at 520 (D.C. Cir. 2019).

Here, there is neither evidence that PHMSA requested information related to the downstream or upstream emission of greenhouse gases, nor is there evidence that this information was volunteered by the applicant. PHMSA’s failure to carry out this basic requirement violates NEPA.

Not only is the primary purpose of the proposed Special Permit directly causing or otherwise facilitating the release of greenhouse gases, PHMSA has conceded that granting the Special Permit will also result in induced development, and increased consumption of natural gas. Specifically, PHMSA states that granting the Special Permit may “result in additional business opportunities to be realized as a result of the efficiencies of transporting LNG by rail and thereby further incentivize domestic production.” EA at 21. PHMSA notes that “[s]uch business opportunities could include end-use applications (such as power plants), export facilities, and the associated loading/unloading facilities that would accommodate such developments.” *Id.* PHMSA’s failure to examine reasonably foreseeable induced development facilitated by the use of the previously prohibited rail tanks is yet a third violation of NEPA.

ETS also directly concedes in its application that approving the Special Permit will incentivize an increase in natural gas production and consumption. ETS stated that the low price of natural gas has made it “not economically viable” to build other types of infrastructure to transport natural gas, which has “resulted in stranded gas.” ETS Application at 9. ETS states that approving the Special Permit will therefore result in “[b]ringing additional amounts of LNG to market.” *Id.* ETS further contends that “transporting LNG by rail as authorized by this Special Permit would result in an *increase* in U.S. exports.” *Id.* (emphasis added). The only way to “increase exports” and bring “additional” LNG to market is to induce increased production, which of course also results in increased consumption.

This induced development is further supported by PHMSA's underlying economic conclusions related to the authorization of the Special Permit. For example, PHMSA notes that using DOT-113 rail tank cars is "less costly" than moving freight by truck, which "further incentivizes production." EA at 15, 21, 22. Specifically, the EA notes that using the rail would be "3.5 times more [fuel] efficient" than hauling via trucks, and that moving "one ton of freight by train would result in 70% less fuel than moving the same freight by truck." EA at 15. These potential savings – assuming they are accurate – combined with the fact that one of the constraints on production is the "limited" nature of other transportation methods, leads to the inevitable conclusion that allowing the use of the DOT-113 rail tank cars will increase production upstream, and result in the burning of more LNGs downstream. However, none of this is accounted for in the EA.

The fact that an "increase in the domestic production and export/use of LNG [is] already underway" is not an excuse for PHMSA to ignore its statutory mandate under NEPA to examine the upstream and downstream greenhouse gas emissions resulting from the proposed Special Permit. For example, in *Sierra Club*, where the agency raised a "practical objection, arguing that it is impossible to know exactly what quantity of greenhouse gases will be emitted as a result of [the approval]." *Sierra Club*, 867 F.3d at 1373-1374. However, the court rejected that argument stating that because the agency already knew the capacity of the pipeline project, it could "estimate greenhouse-gas emissions" resulting from the approval. *Id.* at 1374. Here, PHMSA has provided that the "baseline case of LNG movement" is "700 trucks or 2–4 unit trains per day." EA at 20; *see also* EA at 5, "approximately 1200 MC-338 cargo tanks trucks per day." Based on the availability of this information alone, PHMSA violated NEPA by failing to quantify the total emissions resulting from granting the Special Permit.

### CONCLUSION

For these reasons, PHMSA's Environmental Assessment cannot support the Special Permit application and does not comply with NEPA and the rulemaking process under APA.

We therefore respectfully request PHMSA to deny the Special Permit application submitted by Energy Transport Solutions or, at the least, conduct a full Environmental Impact Assessment to correct these inadequacies and legal errors and reconsider its conclusions on the basis of the corrected information. Please contact us with any questions.

Sincerely,

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*On Behalf of:*  
League of United Latin American  
Citizens Florida  
Delaware Riverkeeper Network  
Center for Biological Diversity  
Mountain Watershed Association  
Clean Air Council  
Sierra Club

**AFFIDAVIT**

Before me, the undersigned Notary Public, personally appeared Fred Millar, who, after being by me duly sworn, upon his oath stated and deposed as follows:

- 1. My name is Fred Millar. I am a public interest and environmental safety advocate, national policy analyst and lobbyist, and consultant, based in the Washington, D.C. area, and have worked for over 40 years on local, national, and international arenas regarding hazmat transportation issues and strategies. Specifically, I have worked on nuclear waste transportation, industrial chemical transportation, crude oil trains, LNG transportation, accident prevention, emergency planning and homeland security. A copy of my curriculum vitae is attached to this Affidavit as Exhibit A.
- 2. Additionally, I served as consultant to major U.S. chemical and oil worker unions, environmental groups, insurance companies, and university and governmental bodies.
- 3. I make this Affidavit based on my own personal knowledge, professional skill, specialized training and education.

FURTHER, AFFIANT SAYETH NOT.

Fred Millar  
Expert's Name

STATE OF VIRGINIA

COUNTY OF ARLINGTON

I, the undersigned Notary Public, in and for said State and County, hereby certify that Fred Millar, whose name is signed to the foregoing Affidavit, and who is known to me, acknowledged before me on this day that, being informed of the contents of said Affidavit, he executed same voluntarily on the day the same bears date.

Given under my hand and seal this 17<sup>th</sup> day of August, 2019.  
Michael R. Larose <sup>ML</sup> Notary Public

My Commission Expires: 12/31/2022

MICHAEL R LAROSE  
NOTARY PUBLIC 7780528  
COMMONWEALTH OF VIRGINIA  
MY COMMISSION EXPIRES:  
DECEMBER 31, 2022

## F. Millar Affidavit

1. I have worked on nuclear waste transportation, industrial chemical transportation, crude oil trains, LNG transportation, accident prevention, emergency planning and homeland security.
2. Additionally, I served as consultant to major U.S. chemical and oil worker unions, environmental groups, insurance companies, and university and governmental bodies.
3. I have analyzed safety problems and advocated for national and grassroots action strategies for chemical hazard assessment, emergency planning, accident prevention, and public access to information.
4. I have worked with citizens, workers, and public officials in scores of petrochemical communities on generic industrial safety issues and on existing risk documents such as worst case accident scenarios. I have pressed for many specific safety improvement activities by companies and governments, commented on many federal rulemakings, and testified in Congress and local city councils.
5. In the post-Bhopal disaster period,<sup>1</sup> while working with allies, I worked to develop new legislation enacting a major new federal regulatory program on prevention of chemical facility accidents.
6. I have written this Expert Statement in the context of the 23-page Draft Environmental Assessment (EA) dated June 5, 2019 from the Pipelines and Hazardous Materials Safety Administration (PHMSA) for the Special Permit 20534 to be granted to Energy Transport Solutions, LLC (ETS) for use nationwide.<sup>2</sup>
7. A full Environmental Impact Statement (EIS) is needed to address what the United States Federal Railroad Association (FRA) has termed the uniquely challenging public safety aspects of LNG rail transport in populated areas.
8. The EA proposes to allow an unprecedented and abrupt opening of the U.S. mainline rail system to long, heavy, hard-to-handle (up to 100 cars) unit trains of Liquefied Natural Gas (LNG), using a 50-year-old rail tank car design, which has never before been authorized for LNG service.

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<sup>1</sup> See generally Alan Taylor, *Bhopal: The World's Worst Industrial Disaster, 30 Years Later*, The Atlantic, Dec. 2, 2014, <https://www.theatlantic.com/photo/2014/12/bhopal-the-worlds-worst-industrial-disaster-30-years-later/100864/>.

<sup>2</sup> See PHMSA, Draft SP 20534 Environmental Assessment, June 5, 2019, Docket PHMSA-2019-0100, <https://www.regulations.gov/searchResults?rpp=25&po=0&s=PHMSA-2019-0100&fp=true&ns=true>. This EA and its slightly modified version dated July 8, 2019, features mainly minor amendments and is wholly inadequate.

## F. Millar Affidavit

9. The EIS must also address the likely upstream and downstream impacts of LNG by rail, including the fracking of natural gas, the new terrorism vulnerabilities posed by urban routing of LNG trains, and the risks of methane leakage and climate change.
10. The most catastrophic environmental impact of all, of course, would be the prolonging of the fossil fuel era with huge LNG investments in North America and worldwide instead of directing those investments to renewable energy resources.
11. The public safety impacts of the current worldwide boom in the LNG industry worldwide have yet to become evident. *See* Nace, Plante & Browning, *The New Energy Boom: Tracking Global LNG Infrastructure*, Global Energy Monitor (June 2019), <https://globalenergymonitor.org/new-gas-boom/>.
12. These public safety impacts may become evident relatively soon. As happened very quickly in the abrupt growth of crude oil unit trains across North America during 2012-2015, when there were several highly flammable derailment disasters soon after the introduction of that rail transportation practice. This bears strong similarities to the LNG unit train operations which PHMSA proposes to approve with Special Permit 20534.
13. The current EA lacks a compelling supply-demand analysis showing strong demand for near-term rail shipment of LNG. There seems to be no compelling need for PHMSA to be moving so quickly on issuance of a nationwide Special Permit for LNG transport by 70-cars-plus unit trains (EA at 3) of rail tank cars, in the absence of reasonably supporting agency research and development actions in the public safety arena. PHMSA's dangerous haste to permit LNG by rail does not take into account what the EA itself admits is the considerable time the shippers and rail industry will need to build out an LNG market and provide a new fleet of DOT-113s for LNG service. EA at 3.
14. The agency research and development actions needed include:
  - a new federally-approved LNG-specific tank car design that meets modern safety standards;
  - rigorous agency testing of either the existing 50-year-old DOT-113 tank car and/or a proposed new design tank car for survivability in derailment conditions, fire impingement, and collision forces;
  - evaluation of the railroads' average 100-car-plus unit train business model which has proved highly risky in triggering the recent 2012-2015 North American trauma of numerous crude oil unit train derailments and is now proposed for LNG by rail; and
  - adequate consideration of mandating LNG train major safety conditions, including protective urban rerouting, odorization of the cargo, and restrictions on train length and speed.



## I. MAJOR PUBLIC SAFETY ISSUES WITH THE EA.

15. The most crucial deficiency is that the EA throughout, while briefly outlining some potential LNG rail release potentials, severely downplays the significant risks of unit trains as well as the unique safety challenges of LNG by rail.
16. This flies in the face of longstanding concerns from Congress, public officials and the public, about LNG facilities and LNG transportation disaster risk potentials. Congress has long mandated that several federal safety agencies share responsibilities in regulating LNG operations, and specifically has advised that LNG facility proponents should seek remote siting. *See* Congressional Research Service, Liquefied Natural Gas (LNG) Import Terminals: Siting, Safety, and Regulation, Dec. 14, 2019, <https://www.everycrsreport.com/reports/RL32205.html> (“We believe remote siting is the primary factor in safety. Because of the inevitable uncertainties inherent in large-scale use of new technologies and the vulnerability of the facilities to natural phenomena and sabotage, the public can be best protected by placing these facilities away from densely populated areas.”)(citing Peach, J.D. General Accounting Office (GAO), Director, Energy and Minerals Division. Testimony to the Senate Committee on Commerce, Science and Transportation. Washington, DC. April 25, 1979. p. 10.)
17. Most important to underscore, the key is *protective distance* between the LNG facility and potentially impacted residents or resources.
18. The current Special Permit 20534 has no mandate for protective re-routing using the multitude of standing railroad interchange agreements, which can avoid in many cases urban areas and sensitive establishments.
19. This Permit *would effectively obliterate any principle of protective distance* in LNG rail operations.
20. The significant public safety risks of LNG facilities and transportation have been of concern to the at-risk public, public officials, and scientists for several decades. The highest concern for decades was for the potential miles-long fire radiation impact disasters from imported LNG ship carriers. Now, in this current era, LNG export-related risks are of paramount concern.
21. Overall, cryogenic LNG loss-of-containment transportation releases involve serious risks of cold embrittlement of nearby structures and surfaces, fire radiation from high and unquenchable gas cloud fires, and offsite travel downwind of flammable and explosive LNG vapor clouds. *See* EA at 7.
22. Even without serious loss of containment, LNG containment vessels are subject to overheating and consequent Boiling Liquid Expanding Vapor Explosions (BLEVEs), as

seen in two recent Spanish LNG truck BLEVE accidents which surprised many LNG experts who had thought such events physically impossible.<sup>3</sup>

23. Because of the large costs and risks of conducting large scale LNG field research, however, LNG experts have periodically indicated that there has been only limited progress in understanding even some of the most basic factors in the behavior of serious potential LNG releases.<sup>4</sup>
24. Therefore, scientists, companies and agencies have to rely on various competing gas release and dispersion models, each with its own assumptions, limitations and uncertainties, to design and regulate and provide industry best practice voluntary guidance for the siting and operation of LNG facilities worldwide. Many experts suggest that these models need more field testing for their validation. They also recognize the important data gaps in the historical record of relevant LNG-specific operations and accidental releases real-world data needed to build valid models. Four dense gas models have been approved for LNG facility siting use by the federal agencies, none specifically for assessing LNG transportation release risks.

## **II. RECENT HISTORY OF PUBLIC CONCERN FOR LNG DISASTER POTENTIALS.**

25. In recent decades worried at-risk residents in many U.S. coastal locations decisively defeated various LNG import facility siting proposals largely because of testimony by gas scientists on distance issues. These scientists, including Dr. James Fay and Dr. Jerry Havens, have underscored the significant LNG release fire radiation risks posed to communities within 2-3 miles of LNG transportation (often LNG marine shipping) routes.<sup>5</sup>
26. Most relevant to the current EA, are the safety agencies, including the Federal Railroad Administration (FRA) that shares regulatory jurisdiction over LNG transportation with PHMSA, have long kept bulk transportation of LNG by rail tank car in the “forbidden” category of the federal Hazardous Materials Table, allowed only under special permit from FRA, and rarely granted. 49 CFR § 172.101.
27. Since 2016, in the context of the current and new growth of the North American LNG industry, FRA has approved two recent regional LNG transport programs via Alaska and

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<sup>3</sup> 17 Planas-Cuchi & Gasulla, et al., *Explosion of a Road Tanker Containing Liquefied Natural Gas*, J. of Loss Prevention in the Process Industries, 315-321 (2004). Attached as Exhibit B.

<sup>4</sup> See e.g., the classic comprehensive work of Woodward & Pitblado, *LNG Risk Based Safety: Modeling and Consequence Analysis* (2010), available at <https://onlinelibrary.wiley.com/doi/book/10.1002/9780470590232>.

<sup>5</sup> See James A. Fay, *Spills and Fires from LNG and Oil Tankers in Boston Harbor*, (2003). Attached as Exhibit C.

Florida railroads,<sup>6</sup> but only with many FRA demands for technical risk evaluations and data reports from the carriers.

28. This report will discuss later the parallel 2017 Exponent QRA for ETS<sup>7</sup>, which was withheld from public view by not being placed on the PHMSA Docket until the very last day of the initial 30-day comment period, which was subsequently extended by 30 days.
29. The recklessness of the recent federal rail LNG regional pilot experiments is suggested by many of FRA's own statements.
30. In an FRA letter dated March 3, 2016, to Florida East Coast Rail, the FRA expressed concern about transporting LNG over routes that traverse Florida's congested, highly populated coastal areas, with scores of often traversed highway-rail grade crossings that involve many pedestrian deaths each year. FRA here also noted that "Any LNG transported along the proposed routes would eventually share the routes with high-speed performance passenger trains [formerly Brightline, now VirginRail] traveling at speeds up to 110 mph." The top speed for the LNG transport on this line, with scores of grade crossings, is 40 mph. *See* letter from Karl Alexy, Staff Director, Hazardous Materials Division, PHMSA to James R. Hertwig, President/CEO of Florida East Coast Railway, Mar. 3, 2016.<sup>8</sup>
31. FRA itself has apparently not produced for public consumption a worst case scenario for either of the high-risk Alaska and Florida regional pilot experiments with bulk LNG, nor any substantial safety evaluation of the pilots, or any risk assessments for LNG by rail operations in general.
32. Contrary to long-expressed Congressional, scientific, and public concerns, PHMSA's draft EA abruptly proposes to bring LNG transportation disaster risks directly by mainline and shortline U.S. rail carriers through virtually all major U.S. cities. This effectively *obliterates* the notion of protective distance, which the EA backhandedly concedes in its dubious assertion that rail transportation is safer than truck transportation because the latter is allegedly in closer "proximity" to populations. EA at 14.

### **III. THE EA LACKS A ROBUST RESEARCH BASIS FOR FEDERAL ACTION ON LNG RAIL TRANSPORT.**

33. Perhaps the most illuminating safety-related statements in the EA (*see* EA at 7) feature sobering risk analysis results from PHMSA's efforts to cobble together for this EA some

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<sup>6</sup> The pilot programs use ISO cargo containers, one-third the volume of the DOT-113 cryogenic rail tank cars proposed under Special Permit 20534.

<sup>7</sup> ETS Movement of LNG in DOT-113 Tank Cars by Rail, Quantitative Risk Analysis (QRA) Considering DOT-113 Tank Car Position in Train and Train Speed, Exponent Project No. 1705991.000 (Oct. 27, 2017) PHMSA-2019-0100-0940, <https://www.regulations.gov/document?D=PHMSA-2019-0100-0940>.

<sup>8</sup> Attached as Exhibit D.

## F. Millar Affidavit

kind of respectable transportation history that could be used to make reasonable estimates of future LNG rail accident scenarios and impacts. PHMSA had to reach far back and try to make conclusions based incorrectly on data from US DOT-113 tank car refrigerated gas shipments of all refrigerated chemicals by rail.

34. No specific data on LNG bulk rail shipments were available because LNG had long been “forbidden” except by special permit from FRA. The EA does not mention the history of any exceptions granted to the ban. The federal safety agencies would no doubt explain this agency ban as a reasonable reaction to LNG’s uniquely challenging risks in the U.S. rail environment. The LNG industry maintains it was simply because of no strong demand for bulk LNG by rail.
35. The EA displays a seriously deficient effort to gather relevant data needed for rational agency action on LNG rail transportation. A big problem evident in the EA’s analysis is that there is a very limited history of incidents with the DOT-113 rail car with any kind of refrigerated liquids.
36. This reflects the very limited number annually of all such cryogenic rail tank car shipments nationally. The EA leaves this important overall data unmentioned. In 2015, only some 12,770 rail cryogenic shipments occurred, according to U.S. Energy Information Administration (EIA) data, a tiny proportion of the 2.3 million railcars annually the AAR estimates for all hazmat rail cargoes. And of those 12,770 annual cryogenic shipments, some 11,000 were of ethylene; the rest were for carbon dioxide, argon, etc. – and none were with the “forbidden” LNG.
37. Reportedly only a relative handful, fewer than 100, of the DOT-113 railcars used for all refrigerated liquid shipments are in service today.
38. Therefore, making statistically respectable estimates, from the skimpy historical record, of the DOT-113 rail cars’ likely performance in future derailments is virtually impossible. One can only note bluntly, as the EA does, that releases can occur and that there is no reason to doubt that in a serious puncture the whole refrigerated LNG cargo is likely to be released and promptly vaporize.
39. PHMSA and the DOT model safety agencies have historically crafted their safety regulations by relying centrally on PHMSA’s own directly relevant data on historical operations and accidents that indicate what kinds of hazmat releases can be expected. PHMSA based its dubious safety assertions in the EA on LNG by rail on a very slim historical data basis of non-LNG rail releases from a rather small U.S. cryogenics industry overall.
40. According to the EA, the first derailment that resulted in the breach of an inner tank of a DOT-113 occurred in May 2011 in Moran, Kansas. Three DOT-113C120 specification tank cars containing liquid ethylene sustained damage. One of the cars was breached in the derailment and initially caught fire, and the other two cars were mechanically breached with explosives and burned due to the damages they sustained from the

derailment. The total quantity of refrigerated ethylene spilled was 44,306 gallons and the total damage estimate was calculated at approximately \$231,000 in 2017. The other derailment that caused tank failure occurred in October 2014 in Mer Rouge, Louisiana. The rail tank cars were filled with refrigerated liquid argon. One car was a DOT-113A90W specification tank car authorized by Special Permit and the other was an AAR204W tank car. The total quantity of refrigerated argon spilled was 47,233 gallons and the total damage estimate is calculated at approximately \$228,000 (in 2017 dollars). No injuries or fatalities were reported as a result of the release of hazardous materials from either incident. The average quantity spilled per derailment involving the analyzed cryogenic liquids, 45,769 gallons, is approximately ten times greater than the average quantity spilled for all rail incidents involving hazardous materials from 2005 to 2017, at 4,807 gallons. EA at 7.

41. Two accidents hardly provide a respectable database for federal action.
42. By contrast, PHMSA has conducted robust research on LNG facility risks.
43. PHMSA has undertaken to improve its data collection and analysis methodologies for regulating LNG facilities, when compared to its lack of research for LNG rail transportation.
44. It is also clear that historically, PHMSA believed that more robust research was needed to assess the potentially high-risk releases from fixed LNG facilities, which have historically been located at significant distances from populations. There is no justification for how PHMSA has declined to conduct a similarly robust risk research effort when it comes to approving LNG by rail, which is arguably a similar, if not more dangerous, activity than LNG fixed facilities. These unit trains will carry LNG up to 100-cars each directly through major U.S. cities which are densely populated.

#### **IV. THE EA IGNORES THE SERIOUS ISSUES WITH COMMUNITY EMERGENCY RESPONSE FOR LNG TRANSPORTATION RELEASES.**

45. A major LNG-related risk issue which PHMSA's EA does highlight is that "offensive" (fire quenching or event containment from close to the release source) emergency response (ER) is essentially impossible for a transportation-related LNG release that can result in an unquenchably hot LNG fire or a huge flammable LNG gas cloud formation 620 times as large as the tank car volume released.
46. Response and mitigation techniques (defensive ER) beyond evacuation for breaches in cryogenic tank cars do not exist or are impractical during a derailment scenario. Breach of a cryogenic tank car will result in the loss of the entire volume of material in the tank car. Incidents are rare, though rail impacts can have tremendous consequences, given the quantity of hazardous materials in transportation. *See* EA at 7.

47. In order to assess the overall risks to public safety from the proposed issuance of Special Permit 20534, one significant question is whether local fire and emergency services are both prepared and equipped to prepare for and to deal effectively with potential LNG rail release emergencies.
48. The U.S. fire service and local officials nearby LNG stationary facilities reportedly are uneducated about the risks of LNG transportation. The bluntest example of this came from Chief Lonnie Click, who responded to, and was Incident Commander, at the March 31, 2014, Plymouth, Washington LNG release accident. Chief Click shared his experience in a Washington D.C. DOT PHMSA and National Association of Pipeline Safety Regulators (NAPSR) LNG Workshop held on May 19, 2016. “Not knowing what we were getting into until we were closer...crash course of learning all about LNG that morning because I really didn’t know much about it.”<sup>9</sup>

## **V. THE IMMEDIATELY PRECEDING HISTORY OF HAZMAT UNIT TRAINS IS SOBERING.**

49. In historical context, the EA is falling in line with the posture of the AAR, which in 2017 petitioned PHMSA for new regulations to open the whole U.S. rail system to LNG using the DOT-113 tank cars.<sup>10</sup>
50. Both AAR and PHMSA have deliberately downplayed the 2012-2015 national trauma caused by the railroad industry’s new crude oil unit train business model that railroads imposed, on a manifestly unprepared North American rail physical and regulatory infrastructure. That analogous recent high-risk industry hazmat experiment situation produced fifteen fiery crude oil unit train derailments with the old puncture-prone DOT-111 railcars, including the 47 fatalities at Lac-Mégantic.<sup>11</sup>
51. The basic LNG by rail safety research has not been done. However, the LNG shippers and carriers want to roll the dice anyway, and the EA demonstrates that PHMSA as a federal regulator is going along with the rush to transport LNG by rail without adequate safety research.
52. The EA never assesses the potential worst case scenarios of LNG release impact distances for either LNG tank car or ISO container trains. The EA completely ignores this potential,

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<sup>9</sup> Presentation available at, <https://www.youtube.com/watch?v=yCTIJaeIAIw&list=PL4wHDsuQ-uKleTf4Z3ca6vJgpiRVTkSZ2&index=3>.

<sup>10</sup> Robert E. Fronczak, AAR, Petition for Rulemaking to Allow Methane, Refrigerated Liquid to be Transported in Rail Tank Cars, <https://www.regulations.gov/document?D=PHMSA-2017-0020-0002>.

<sup>11</sup> See Justin Mikulka, *Trump Order to Allow LNG by Rail Would Expand Bomb Train Risks*, Desmog Blog, Apr. 17, 2019, <https://www.desmogblog.com/2019/04/17/trump-executive-order-lng-rail-bomb-train-risks>.

## F. Millar Affidavit

even while proposing to grant the Special Permit which would move enormous 100-car LNG unit trains as potential terrorist weapons into and through major U.S. cities.

53. The EA simply declines to produce any such consequence estimates of distances, asserting that, for LNG-specific U.S. rail transportation, the U.S. historical data, field research and gas dispersion modeling are absent. While this is true, it is not a decisive obstacle to some reasonable agency effort on modeling and estimation of impact distances.
54. The EA repeatedly downplays the potential disaster consequences by asserting that there is an arguably low LNG release probability and that the likelihood of accidents and releases and resulting fires/explosions/BLEVEs is low.
55. The EA does indicate some potential LNG rail car release scenarios, but omits key consequence factors which need explicit consideration, such as:
- The EA omits mentioning the huge volume of even a single LNG rail car flammable gas cloud release. The released gas cloud that could move into a nearby community is 620 times larger than the rail car liquid volume released.
  - The EA omits discussing in detail the most severe offsite LNG release Worst Case Scenario: an LNG flammable cloud if not immediately ignited can travel far downwind, and if it gets “confined” in any number of ways, can explode. Such a release occurred in the 1944 Cleveland, Ohio, LNG storage tank disaster that released LNG vapor clouds which entered the sewer system caused explosions over a 1 square mile area, killing 128 people.
56. In the few sections in which the EA even mentions the worst case scenario question of “how far will the harmful impacts of various LNG releases extend,” the EA declines to answer:

The distance over which an LNG vapor cloud remains flammable is difficult to predict. Local weather conditions (wind speed, atmospheric stability or turbulence), terrain, surface cover (i.e., vegetation, trees, and buildings) will influence how a vapor cloud disperses, and how rapidly it dilutes. If an LNG vapor cloud is ignited before the cloud has been dispersed or diluted to below its lower flammability limit, a flash fire may occur. Unlike other flammable liquids and gases, a LNG vapor cloud will not entirely ignite at once. If ignited, the methane in LNG has a flame temperature of about 1,330°C (2,426°F). The resulting ignition leads to a relatively slow (subsonic) burning vapor fire which travels back to the release point producing either a pool fire or a jet fire.

EA at 8.

57. And the EA mentions, but dismisses in three short sentences, the real LNG release worst case scenario, is that of possible “confined” LNG cloud explosions. *See* EA at 9.

...Such a slow burning (released LNG) vapor fire will not generate damaging overpressures (i.e. explosions), if unconfined. To produce an overpressure event, the LNG vapors need to be within the flammability range and ignited, and either be confined within a structure or the travelling flame in the open encounter structural obstructions (houses, trees, bushes, pipe racks, etc.) that can increase the flame turbulence significantly. Other hydrocarbons that are transported by rail and highway, such as propane and butane, are more susceptible to vapor cloud explosions when they become vaporized. EA at 9.

58. Many gas scientists and agency experts now would agree that LNG cloud “confinement,” leading to a possible spontaneous explosion, does not depend on the cloud being in a “structure,” but could occur by the cloud’s being “confined” under a rail car, between two homes, in a ditch or ravine, or being held up by a wall or even dense vegetation. The EA does suggest awareness of this potential danger with LNG. EA at 9. However, the EA does not try to estimate:

- the distances that a large, dense, ground-hugging LNG vapor cloud can travel into a community if unconfined; nor
- what extraordinary confinement risks are posed in a rail and especially an urban rail environment where trackside obstacles such as the EA-cited examples of “houses, trees, bushes...” exist, along with many other potential obstacles such as tunnels, overpasses, and buildings that often overlook train tracks.

59. The EA tries to deflect from the unique risks for LNG only by saying that other common flammables in transportation such as propane and butane can ignite and explode “in much less confined conditions.” EA at 9.

## **VI. THE EA IGNORES THE LIMITED RESEARCH THAT IS AVAILABLE ON LNG OVER-LAND RELEASE RISKS.**

60. As the EA underscores, there is a paucity of federal research on LNG releases over-land, whereas there are decades of research pertaining to potential LNG releases over-water from ships. However, the EA selectively ignores some arguably relevant and useful LNG flammable vapor cloud research and misuses irrelevant toxic gas cloud research.

61. Puzzlingly, the EA does not discuss the one classic 1987 federally-sponsored Falcon series of 4 LNG over-land gas release tests. Five tests had been planned, but the fourth unexpectedly blew up the whole federal test apparatus and ended the test series.

62. The 1987 Falcon tests had been designed to show industry and government agencies how effective facility-provided LNG vapor barrier enclosures could be. The primary purpose of the test was not to measure downwind, and therefore only a few gas concentration sensor



## F. Millar Affidavit

arrays were erected downwind, and only out to 100 meters and 250 meters distance. The Falcon researchers did not in the later tests add more sensors downwind, although the gas clouds from the two largest of the 4 releases (Falcon-1 and Falcon-3) were recorded going beyond the 250 m sensors at levels above the dangerous Lower Flammable Limit (LFL) for LNG of 2.5% (LNG to air ratio). The farther distances went unrecorded.

63. The completed Falcon field research trials showed the released dense LNG cloud temporarily “held up” by and then rapidly filling up the four-sided, 9-meters tall fiberglass cloth vapor barrier enclosure, then overtopping the barriers and moving downwind. Some industry observers reportedly expressed keen disappointment at the minimal success of the barriers in preventing downwind travel of the gas cloud.
64. The released clouds traveled at a dangerous level beyond 250 meters. This is the most important solid federal field test research result that can be cited for assessing how far an LNG release can travel over-land, which is 250 meters-plus.
65. The EA does not even attempt to grapple with the implications of the Falcon research for the formidable issues of how many kinds of real world obstacles exist in the U.S. rail transportation environment, especially in urban rail corridors, which obstacles could provide numerous kinds of “vapor barriers” for an accidental or terrorism-released LNG vapor cloud.
66. Beyond its assertions of insurmountable difficulties in LNG consequence calculations, the EA asserts further it cannot even make robust calculations of the probabilities of LNG rail releases because of the same cited gaps in LNG rail transportation data and research. Respectable professional probability analysis, it is true, demands robust and relevant historical data and prior calculations of consequence as the basis for arriving at the final calculations of probabilities of given releases.
67. Notably, while discounting the value of learning from historical LNG stationary facility releases such as the Cleveland<sup>12</sup> and Skikda<sup>13</sup> disasters, the EA dubiously cites the 2010-2015 era industry/federal Jack Rabbit I and II research project, specifically its narrow findings on toxic chlorine gas release impacts on soil or vegetation. EA at 19. The EA suggests, without a rationale, that LNG would have similar minimal impacts upon vapor cloud deposition on the ground over which it travels.
68. The Jack Rabbit tests have no direct relevance to LNG, and the EA does not mention that the purpose of the industry/federal Jack Rabbit field and lab tests was to support their joint

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<sup>12</sup> See e.g., *The Day Cleveland Exploded: 70 Years Later, the Unthinkable Disaster of the East Ohio Gas Co. Explosion*, Cleveland Scene, Oct. 15, 2014, <https://www.clevescene.com/cleveland/the-day-cleveland-exploded-70-years-later-the-unthinkable-disaster-of-the-east-ohio-gas-co-explosion/Content?oid=4391878>.

<sup>13</sup> See e.g., Simon Romero, *Algerian Explosion Stirs Foes of U.S. Gas Projects*, N.Y. Times, Feb. 12, 2004, <https://www.nytimes.com/2004/02/12/business/algerian-explosion-stirs-foes-of-us-gas-projects.html>.

## F. Millar Affidavit

efforts to minimize the perceptions of risks of toxic gas releases. The outcome was instructive. The Fire Administration did not buy into this effort and insisted on more conservative risk estimates as in the 2012-2016 ERG.<sup>14</sup>

69. A reasonable overall conclusion, therefore, from the PHMSA-identified research gaps on LNG risk issues does not let the agency off the hook. PHMSA cannot rationally grant nationwide LNG rail transportation permits, much less national regulations, for LNG rail transportation until robust and necessary agency research is completed and analyzed, to inform an adequate EIS.
70. Field research is especially needed on the both the fire survivability and impact crashworthiness of the 50-year-old design DOT-113 cryogenic tank cars which the Permit proposes to authorize for nationwide use.<sup>15</sup>
71. The EA cites no crash testing or fire testing at all, much less with LNG cargo specifically, of the 50-year-old DOT-113 design tank car proposed for this permit.
72. The updated EA changed its estimation—with no explanation—of the probability, which the EA elsewhere asserted was unknowable, of an LNG rail release high consequence scenario involving “inner tank damage resulting in large release/spill.” Instead of its earlier estimation of “very low” probability, the updated EA version estimate now asserts, citing no evidence, “low.” EA at 12.

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<sup>14</sup> The then-current scientific consensus had been producing alarming toxic gas science predictions, in industry and government gas dispersion modeling—e.g., of serious potential chlorine gas releases [often rail car releases were modeled] travelling 20-25 miles downwind. The reactive risk-minimization research effort was to explore in federally funded lab and field research every conceivable new environmental factor that could be asserted to diminish the predicted downwind impact of chlorine gas releases from accidents or terrorism, then to inject such results into gas dispersion science models for toxic gases, and finally especially into the Emergency Response Guidebook (ERG) guidance for emergency responders.

This multi-year Jack Rabbit project propaganda effort ultimately proved controversial with the U.S. fire service observers/participants. Even though the Jack Rabbit research results have been published in two articles in Fire Engineering magazine in efforts to influence the fire service community to take chlorine gas release risks less seriously, the fire service participants apparently managed to influence the authors ultimately to reaffirm instead the more safety-conservative and longstanding ERG advice on long Protective Action Distances for chlorine gas releases.

<sup>15</sup> “When you begin to look at cars that are derailing at speeds of 30, 40 miles an hour, it’s very difficult, it’s a big ask, to expect that a tank car get hit [and] not be breached.” Karl Alexy, staff director of the Federal Railroad Administration’s Office of Safety, said in the National Transportation Safety Board’s April 22-23 National Forum on Crude Oil and Ethanol Transportation Safety.

[https://www.nts.gov/news/events/Pages/2014\\_Crude\\_Oil\\_Ethanol\\_FRM\\_Agenda-Presentations.aspx](https://www.nts.gov/news/events/Pages/2014_Crude_Oil_Ethanol_FRM_Agenda-Presentations.aspx).

73. EA repeatedly makes unsupported assertions minimizing LNG rail transportation risks. Again with no evidence cited from any relevant testing, EA asserts the LNG release behaviors would be similar in both rail and truck release emergencies:

Incident data with (non-LNG) hazard materials may suggest that incidents involving rail tank cars can lead to a larger area of consequence as compared to hazard areas arising from incidents involving MC-338s cargo tank motor vehicles (or ISO portable tanks moved by rail). This is because of the larger volume of LNG in each tank car compared to that in a MC-338 cargo tank. ... It is important to note that the risks of transporting LNG via rail also apply to the shipment of LNG via highway. As discussed above, the transportation of LNG by cargo tank is already permitted by the HMR. ... The risks that would increase with the selection of the No Action Alternative are increased trips (because of lower volume transported per cargo tank), thereby increasing opportunity for an incident, higher accident rate for highway traffic as compared with rail traffic, and closer proximity to people and inhabited structures on roadways as compared to rail rights of way. On the other hand, a larger quantity LNG loaded into each rail tank car, along with the risks that result from multiple tank cars moving together, could lead to higher consequences. A failure of either an MC-338 or a DOT-113 could cause injury, death, property destruction and environmental harm. The likelihood of failure of MC-338 is higher, but the scope of potential of injury and death, could be greater in a populated area for a DOT-113 failure because of higher volumes of LNG carried in each tank car (by about a factor of 3) compared to that in a MC-338 transport. EA at 14-15.

## **VII. THE EA ASSERTS THAT RAIL IS SAFER THAN TRUCK, WHILE IGNORING POTENTIAL TERRORISM VULNERABILITIES.**

74. Rather astonishingly, the EA asserts that LNG by rail tank car will be safer than the existing LNG by tank truck. The LNG trucks often travel from remotely located liquefaction facilities to remote natural gas mining that is not well served by pipelines.
75. However, the EA alleges with no evidence, that highways used by truck cargoes are in closer “proximity to densely populated areas compared to the location of rail tracks.” EA at 14. The EA does concede that a unit train possibly with 100 tank cars of LNG will carry a huge quantity, much more than a single MC-338 truck LNG vehicle or an ISO container on a single flat car.
76. The EA refrains from mentioning that it was the U.S. chemical shippers and rail industry that post-9/11 had to expend political capital fighting major cities worried about potential

hazmat train terrorism. Upon his death, it was discovered that Osama bin Laden had advised his cadres to attack US energy infrastructure.<sup>16</sup>

77. The EA needs to show the data regarding which mode is preferable from a disaster-prevention perspective.
78. The EA's minimizing of rail LNG accidental release risks and its complete neglect of rail LNG terrorist potentials are both facilitated by this EA characterization, without any data provided other than volumes of cargoes of rail transport of ultra-hazardous cargoes as safer than truck transportation. The terrorist threat to the U.S. freight rail systems has not evaporated.
79. One can hardly tout LNG as a major new essential element in U.S. energy security and simultaneously decline to address the potential for long and visible LNG trains moving relatively slowly through major cities to be very attractive targets for terrorism.<sup>17</sup>
80. Historically, and of key relevance, in the post-9/11 period, keen public and official recognition of rail urban hazmat safety and security vulnerabilities prompted strong efforts to get national protective hazmat urban rail routing regulations. Major media attention found urban rail hazmat terrorism risks very credible.<sup>18</sup>
81. Unfortunately, the Congressional urban rail hazmat re-routing proposals were soundly defeated in 2007 by the railroads and chemical shippers, in favor of Public Law 110-53, which has led to virtually no protective urban rail re-routing.
82. In 2015, CEO of Canadian Pacific, Hunter Harrison, lamented in the media that he was uncomfortable that his rail line was still routing very dangerous cargoes through Chicago – and other major North American cities.<sup>19</sup>
83. The international hazmat risk literature also seems sparse on the risks posed by rail versus truck transportation, as if it is generally assumed that truck transportation is ubiquitous. As commented by one Lithuanian QRA study focused on the probability of roadside damage posed by the two most serious types of fire and explosion transportation releases from liquefied gases: “Any comprehensive study which compares in detail the risks posed by

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<sup>16</sup> Jeanne Meserve & Carol Cratty, *U.S.: Al Qaeda Has Interest in Strikes on Energy Infrastructure*, CNN, May 20, 2011, <http://www.cnn.com/2011/US/05/20/terror.alert/index.html>.

<sup>17</sup> Bridget Johnson, *How the Terror Threat to Rail Has Evolved 15 Years After Madrid*, Homeland Security Today, Mar. 12, 2019, <https://www.hstoday.us/subject-matter-areas/terrorism-study/how-the-terror-threat-to-rail-has-evolved-15-years-after-madrid/>.

<sup>18</sup> See Richard A Falkenrath, Op-Ed: *We Could Breathe Easier: The government must increase the security of toxic chemicals in transit*, Wash. Post, Mar. 29, 2005.

<sup>19</sup> Eric Atkins, *CP Rail CEO Says Terrorists a Greater Threat than Derailments*, The Globe and Mail, Mar. 2, 2015 (updated May 12, 2018), <https://beta.theglobeandmail.com/report-on-business/cp-rail-ceo-says-terrorists-a-greater-threat-than-derailment-to-oil-tank-cars/article23254667/?ref=http://www.theglobeandmail.com&>.

VCEs (Vapor Cloud Explosions) and BLEVEs (Boiling Liquid Expanding Vapor Explosions) on road or rail is not known to us.”<sup>20</sup>

84. This Lithuanian study cites U.S. data on reported accidents from 2003 to 2013, including “a very large number of which little or no damage” that indicate that “hazmat transportation by rail causes a substantially smaller number of accidents and incidents than moving such materials by truck.” In the 2003-2013 period the totals reported were 478 fires and 375 explosions by road, versus 36 fires and 9 explosions by rail. Vaidogas, Egidijus & Kisežauskienė at 443. But the study cites no reports of comparative damage to structures or people from road or rail incidents, or of accidents relative to total mileage of road versus rail, or relative to mileages through populated areas.

### **VIII. THE EA COULD HAVE USED EXISTING GAS MODELS TO ESTIMATE LNG RISKS, AS MANY OTHER RESEARCHERS HAVE DONE.**

85. Notably, even if PHMSA in its EA has been unwilling to estimate distance potentials for an LNG tank car rail release, a multitude of others in government and industry have been using well-known available and approved gas science modeling for estimating the distance consequences of various hypothetical LNG facility and rail car releases.<sup>21</sup>

86. A prominent example of agency and researcher use of gas modeling to assess LNG rail transportation risk exists in the FRA-permitted LNG rail transportation experiment along Florida’s East Coast Rail. Although DOT agency FRA has apparently had in its possession

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<sup>20</sup> Vaidogas, Egidijus & Kisežauskienė, et al., *Assessing Risk To Built Roadside Property Posed By Transportation Of Liquefied Gasses*, 254-259, 445 (2013), [https://www.researchgate.net/publication/269062884\\_Assessing\\_Risk\\_To\\_Built\\_Roadside\\_Property\\_Posed\\_By\\_Transportation\\_Of\\_Liquefied\\_Gasses/link/57556d6808ae0405a5752636/download](https://www.researchgate.net/publication/269062884_Assessing_Risk_To_Built_Roadside_Property_Posed_By_Transportation_Of_Liquefied_Gasses/link/57556d6808ae0405a5752636/download).

<sup>21</sup> For fixed LNG facilities, the U.S. Federal Energy Regulatory Commission (FERC) has for at least three decades required facility staff to model (using four officially FERC-approved standard gas models, at least one of which is proprietary) the regulatory proposed facility Exclusion Zone for potential LNG release impact distance calculations, which is an essential factor in winning FERC approvals of LNG siting. These calculations are not of worst case scenarios, but of less severe, credible facility releases based on “Design Basis Accidents” and modeling of their consequences. After working through the required distance calculations, FERC and the facility experts then delve into the non-well-defined and non-regulated areas when they consider various additional probabilistic release factors such as onsite facility-promised mitigations (e.g., the effectiveness of proposed facility-promised vapor barriers to “hold up” a released LNG cloud). FERC staff makes its own (un-transparent and significantly subjective) final overall assessments of the likelihood of the facility’s potential LNG release impacts on the public, and eventually (almost always) assesses the approved proposed sites as “adequately safe.” The LNG industry is constantly working to inject even more probabilistic elements into FERC regulation.

## F. Millar Affidavit

the seemingly relevant 2016 FECR QRA document, it is unmentioned by this EA, and has been kept essentially secret so far by FRA.<sup>22</sup>

87. This 2016 FECR QRA is perhaps the most illustrative indication of the industry and government determined consensus that the public needs to be kept in the dark, by various means, on potential LNG release impact distances:
- The QRA methodology itself has been utilized by disaster risk-imposing industries, such as nuclear power and toxic chemicals, as it is designed to obscure the consequence distance estimates, which are nonetheless a necessary step for the overall risk calculations; and
  - FRA has not released the 2016 FECR QRA document to FOIA requests, except with every single data point redacted.
88. The skimpy EA does not impose any new significant LNG-specific safety conditions in this proposed Special Permit for ETS, but explicitly relies only on existing federal hazmat regulations regarding generic highly flammable tank car rail carriage.
89. The EA has added in—without substantial analysis or even discussion—the voluntary consensus railroad industry minimum standard guidance in AAR Circular OT-55Q. This is the latest version of industry’s OT-55, which was introduced many years ago for AAR-member railroad guidance on handling the most dangerous toxic and radioactive rail cargoes, with no consideration of flammable cargo risks.
90. In order to undergird a set of federal actions (permits, rulemaking, etc.) PHMSA could easily adapt and use—with relatively respectable assumptions, but without performing a full probabilistic QRA—one of the long-approved LNG gas dispersion models (or other models if arguably more adequate) for a set of representative potential LNG rail car releases and publish in an EIS the impact distance results for a selected set of potential LNG rail car releases: pool fires, vapor cloud travel and explosions, and BLEVEs.
91. PHMSA consultant Cambridge Systematics, Inc., recently provided a simplified risk analysis without any details of potential release scenarios or distances. The report recommended strongly that PHMSA commission a full-scale QRA to underpin future agency safety actions on LNG rail safety. This is estimated to be very costly and take at least a full year. It is unknown whether PHMSA has begun such an effort. The abrupt proposal for Special Permit 20534 and previous PHMSAS R&D summary presentations seem to imply that it has not.<sup>23</sup>

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<sup>22</sup> Exponent, Florida East Coast Railway Quantitative Risk Analysis (FECR QRA) Considering LNG Position in Train and Train Speed, Exponent Project No. 1308194.001, attached as Exhibit E.

<sup>23</sup> Cambridge Systematics, Inc., *Risk Assessment of Surface Transport of Liquid Natural Gas*, Mar. 20, 2019, <https://www.phmsa.dot.gov/sites/phmsa.dot.gov/files/docs/research-and-development/hazmat/reports/71651/fr2-phmsa-hmtrns16-oncall-20mar2019-v3.pdf>.

92. PHMSA’s potential future LNG release consequence modeling would, of course, be open to expert challenge, given the lack of LNG-specific data and transportation models that EA underscores and the large uncertainties in any modeling.
93. I do not call uncritically for PHMSA to conduct a full-blown QRA of the proposed nationwide LNG by rail, since QRAs are by design efforts to obscure the potential chemical release consequence impact distances under layers of complex probabilistic calculations. The FECR QRA on LNG rail in Florida is a notable example of this, as can be glimpsed - —as through a glass darkly— even in its redacted version. It would be useful, however, if PHMSA and FRA as part of this permit proceeding would release the 2016 FECR QRA in its currently withheld unredacted version.
94. An unexpected new indication of industry and agency efforts to keep the public in the dark, from the PHMSA-2019-0100 docket at issue here is that the draft EA never mentions that ETS itself, the requestor of the permit, back in 2016 or 2017, had commissioned from Exponent consultants a QRA for national LNG rail risks. That document, dated October 27 2017, was withheld from the PHMSA docket until the very last day of the original 30-day comment period which ended July 8 2019. It was then placed on the docket, and it is now listed as one of the official proceeding documents<sup>24</sup> on the docket at <https://www.regulations.gov/document?D=PHMSA-2019-0100-0918>.

## **IX. THE EA ULTIMATELY CONCEDES THAT PROTECTIVE DISTANCE IS NEEDED FOR LNG EMERGENCIES.**

95. The EA ultimately underscores the flaws of its public safety argument by compromising weakly, but perhaps usefully on the LNG potential release impact distance question. EA at 12.
96. The EA very briefly endorses (with no analysis) the Protective Action Distance guidance for flammable cargoes in the DOT Emergency Response Guidebook (ERG),<sup>25</sup> which is highly revered by the North American fire and emergency services. In its generic, simplified “Orange Pages” guides for highly flammable gases (including its Guide 115 for refrigerated liquids such as LNG), the current ERG2016 –and previous editions produced by PHMSA every 4 years—provides a widely-used “bible” intended to be used by first responders explicitly only for their initial decisions in the first 20 minutes of a “large spill” of various high-risk chemical cargoes in a transportation emergency.
97. The ERG’s Guide 115 has long advised first responders to “consider initial downwind evacuation” of half a mile if there is even a single breached refrigerated liquids transportation container with no fire. But if the container is involved in a fire, emergency

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<sup>24</sup> *Supra* n.7.

<sup>25</sup> PHMSA, 2016 Emergency Response Guidebook, <https://www.phmsa.dot.gov/sites/phmsa.dot.gov/files/docs/ERG2016.pdf>.

F. Millar Affidavit

responders should isolate the scene (prevent entry) for one mile in all directions and also “consider initial evacuation for one mile in all directions.”

98. Notably, this EA does not consider the public safety implications of this advice regarding some potential need for appropriate safety precautions in the proposed LNG nationwide rail transportation.
99. The EA leaves unexamined, moreover, the question of whether and how this generic ERG guidance is adequate for LNG cargoes specifically. For large nighttime spills from rail tank cars and low wind conditions, the 2016 ERG’s Initial Isolation and Protective Action recommendations for toxic chemicals in Table 3 vary from 2.7 miles (ammonia) to 7+ miles (chlorine) to 7+ miles (sulfur dioxide).
100. The ERG has not, up until to now, singled out LNG rail transportation risks specifically for similarly targeted advice, perhaps because LNG has long previously been “forbidden” for U.S. rail transportation and with only a relatively small history of LNG truck shipments.
101. Perhaps with the boom in North American LNG infrastructure, the soon-to-be published ERG 2020 may consider adding such a specific focus on ER needs for LNG transportation releases.