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Washington, DC 20590

Comment Re: Docket Number PHMSA-2018-0025 (HM-264)

To Drue Pearce, Deputy Administrator, Pipeline and Hazardous Materials Safety Administration:

The Pipeline and Hazardous Materials Safety Administration (PHMSA), in coordination with the Federal Railroad Administration, has proposed potential changes to the Hazardous Materials Regulations that permit the bulk transport of liquefied natural gas (LNG) in rail tank cars. Specifically, the proposed rules would authorize the transportation of LNG-by-rail in certain DOT specification 113 (DOT-113) rail tank cars. Please accept these comments on behalf of Washington Physicians for Social Responsibility, Oregon Physicians for Social Responsibility, Columbia Riverkeeper, Willamette Riverkeeper, 350 PDX, 350 Seattle, 350 Tacoma, Oregon Conservancy Foundation, Rogue Climate, Citizens for a Healthy Bay, Stop Fracked Gas PDX, Climate Action Coalition, The Lands Council, 350 Eugene, Cascadia Wildlands, the University of Oregon Climate Justice League, 350 Eastside, Center for Sustainable Economy, Washington Environmental Council, Food and Water Action, OneAmerica, Washington Interfaith Power & Light, Earth Ministry and the Power Past Fracked Gas Coalition regarding the proposed rulemaking. We have also attached our previous comments on the special permit for Energy Transport Solutions, and we incorporate the concerns raised in those comments by reference.

The shipment of LNG via rail would impose significant new health, safety, environmental, and economic hazards for communities along potential rail routes—communities which disproportionately include minority and low-income populations. Accordingly, PHMSA’s proposed rule to allow large-scale shipments of LNG-by-rail could threaten human life and destroy neighborhoods or whole downtowns. Despite this clear and significant risk, the Federal Register notice and Environmental Assessment (EA) provide very little data and only a cursory analysis of potential LNG rail safety hazards. We are concerned that this rulemaking may create new, unaddressed risks that could put communities in danger from LNG train derailments, fires, explosions, and other hazards.

Here in the Pacific Northwest, we have seen multiple proposals for liquefied natural gas (LNG) terminals and are well-aware of the risks associated with having these terminals in our communities. As the gateway between coastal LNG facilities and Asian markets that may purchase the fuel, many Pacific Northwest communities located along rail lines could see shipments of hazardous LNG running past their homes and schools should this rule go forward. Specifically, a liquefied natural gas (LNG) facility proposed in Tacoma, WA, an industrial town with heavy fossil fuel rail shipment adjacent to schools, homes, businesses, and the reservation of the Puyallup Tribe of Indians poses a major concern. Should both this facility and rule move forward, the health and safety of thousands of Tacomans would be at risk from explosions, fires, or other risks associated with an LNG train derailment.

Recent oil train derailments in North America—such as Lac Megantic, Quebec; Mosier, Oregon; and over a dozen other communities—demonstrate that rail-related accidents are not uncommon and can lead to health hazards, public safety risks, environmental damage, and even fatalities. LNG trains may pose even more severe fire and safety risks than oil trains. Data on LNG rail hazards is scant, which raises serious questions about the wisdom of proposing a new rule that could lead to LNG shipments throughout cities, towns, and sensitive areas nationwide.

We urge PHMSA to withdraw the proposed rule and prepare a full, thorough Environmental Impact Statement (EIS) to address the serious public safety, environmental, and economic risks associated with shipping large volumes of LNG via rail through communities across the United States. Alternatively, we urge PHMSA to abandon the proposed rulemaking because of the significant unaddressed risks of shipping LNG via rail.

**A. The Risks Associated With Transporting LNG by Rail Are So Significant, PHMSA Should Conduct a Full EIS.**

PHMSA’s environmental analysis ([Section J](#) of the published notice) falls far short of providing adequate data or analysis to address the potential environmental, public safety, or economic hazards associated with a proposed rule allowing LNG-by-rail shipments. The threat of a

potential LNG train derailment poses an extreme danger for the communities through which those trains travel. If an LNG train derails and any of its cars puncture and release LNG, the spilled LNG would likely re-vaporize quickly, forming a vapor cloud that could ignite.<sup>i</sup> The ensuing fire could impact people, property, and natural resources over a large area. If the LNG failed to ignite initially, the unignited, dense LNG vapor cloud could move over a large distance, find an ignition source, and burn back to the point of the LNG release. In summary, the fire, explosion, and vapor cloud risks associated with a train carrying three million gallons of LNG could impact a multi-mile radius from the site of an LNG train derailment.<sup>ii</sup> The EA, however, glosses over these risks, focusing instead on a comparison of the risks of LNG transport via truck versus rail. The risks associated with transporting LNG by rail are so significant, we strongly urge PHMSA to conduct a full EIS.

1. The risks of transporting LNG by rail are more accurately comparable to LNG storage facilities than truck transport.

The volumes of LNG involved in a truck accident are exponentially smaller than the volumes that would be transported by an LNG unit train and are thus not comparable. The risks associated with transporting large volumes of LNG by rail are more accurately comparable to the risks associated with LNG storage facilities. Recent incidents related to LNG storage and manufacturing provide examples of the highly volatile nature of LNG. These incidents demonstrate that LNG-related hazard distances are measured in miles, spanning large areas. For example, in Plymouth, Washington, a fire and explosion at an LNG facility injured five workers and prompted the evacuation of two-mile radius near the ruptured LNG tank.<sup>iii</sup> The Plymouth evacuation stemmed in part from the risk of a flammable vapor cloud, and it caused a major disruption to the local area, including disruptions to rail and road traffic as well as a lengthy evacuation for local residents. According to a report on the incident from Sightline Institute,

Fumes from the facility sickened [residents and emergency responders](#) and endangered the public. The leak formed a dangerous cloud of gas vapors, which an east wind pushed toward the town of Plymouth. Vapor clouds become more dangerous as they drift away from the site of the leak and mixed with oxygen: at a [5 to 15 percent concentration](#), a vapor cloud that meets a spark or flame can catch fire and [burn all the way back to the source](#). To protect public safety, state officials [evacuated](#) Plymouth LNG employees as well as residents within two miles of the facility. They [shut down traffic](#) on the nearby Columbia River, parts of Highway 14, and the rail lines near the plant, which helped reduce ignition sources for the escaping gas.

Emergency responders—there were [more than 100](#) on the scene—had to wait for the wind to dissipate the natural gas before they could safely enter the

facility and address the leak. The wait was drawn out by LNG's extremely low temperature: the leak kept forming [ice blockages over the hole](#) in the tank. External temperatures would then melt the ice, and the leak would continue. Hazardous materials experts were finally able to enter the facility [eight hours](#) after the explosion.<sup>iv</sup>

The risks from LNG trains are potentially greater than from LNG storage because LNG trains would be moving at speeds up to 50 miles per hour through populated areas, making rapid, widespread evacuations difficult. Additionally, local first responders may be uninformed about LNG-by-rail risks, and PHMSA's proposed rule does not describe how specific LNG-related risks can be addressed in rail communities.

Transporting LNG by rail poses unique risks that deserve focused attention in a full EIS. LNG rapidly vaporizes when it comes in contact with water. When spilled, research demonstrates that LNG vapors can asphyxiate people nearby by displacing oxygen, and direct skin contact with LNG can flash-freeze human flesh. The flammability range of LNG vapor in air (LNG vapor, which is primarily methane, will burn at vapor concentrations of 5 to 15%) differs significantly from other cryogenic fuels such as ethylene and may contribute to enhanced vapor cloud risks. A recent research compendium on natural gas prepared by physicians and health experts found that fires caused by LNG accidents can result in second-degree burns up to one mile away.<sup>v</sup> Additionally, LNG terminals have been identified by agencies including the Congressional Research Service (CRS) as vulnerable to terrorist activity due to extreme risks from explosions. Unguarded trains full of LNG running within close proximity to homes and schools would present an even greater vulnerability. The CRS report also identified how spills of LNG during storage or transport can lead to pool fires and flammable vapor clouds<sup>vi</sup>

PHMSA wrote in the proposed rule, "Exposure to radiant heat from an LNG pool fire or being caught within the flash vapor fire could result in fatalities, serious injuries, and property damage." PHMSA attempted to downplay these risks by adding, "These risks also exist in the transportation of LNG via highway, existing rail transportation, and pipeline" without providing evidence that these other activities are actually similar to the shipment of large volumes of LNG in rail cars that can puncture at the speeds they travel. Accordingly, PHMSA should prepare a full EIS to evaluate the risks of LNG trains.

2. PHMSA's reliance on the safety record of DOT-113 rail cars ignores the added risk of multi-car trains.

PHMSA points to the safety record of DOT-113 rail cars to conclude that the risk of a catastrophic accident involving LNG transport by rail is low; however, PHMSA fails to account for the fact that LNG trains could be comprised of up to 100 railcars. Cumulatively, a 100-car

train carrying LNG poses a much greater risk than a single tanker truck. In the public notice, PHMSA states that “ given the safety history of the DOT-113C120W tank cars, it is expected that the risk of tank car failure and ignition is low.” As described elsewhere in our comments (and in many others), PHMSA has failed to provide analysis to justify its claim that the current known safety record of DOT-113 rail cars provides a meaningful comparison to the large-scale shipment of 100-car trains of LNG throughout the U.S. PHMSA’s proposed rule would change the scale and potential geographic scope of LNG-by-rail hazards overnight.

PHMSA should consider how the massive risks of oil-by-rail shipments, and the inadequacy of DOT-111 rail cars, only became apparent to a broad audience as a result of repeated, catastrophic, and even lethal incidents involving oil train derailments. Comments submitted by the National Transportation Safety Board (NTSB) highlight this problem, stating,

...derailments involving DOT-113 tank cars can result in large quantities of hazardous materials being released and the consequences of such an event could be more severe than releases from cargo tank motor vehicles. Recent history with unit train shipments of ethanol and crude oil demonstrate how unprepared federal regulators were to address the spate of fiery flammable liquids accidents that occurred between 2009 and 2015 until regulations for HHFTs were published.<sup>vii</sup>

Furthermore, PHMSA fails to provide adequate data or analysis to support its conclusions about how DOT-113 cars and their cargoes will behave in a crash on main line rail routes. The NTSB has expressed severe concerns with PHMSA’s approach. NTSB writes in its December 5, 2019 comments, “Because unit trains of DOT-113 tank cars carrying large volumes of flammable cryogenic gases have no operational or accident performance safety history, we believe a thorough safety assessment of the tank car specification is needed.”<sup>viii</sup> PHMSA suggests that trains will move at speeds up to 50 mph. In the Pacific Northwest, trains routinely travel 50 mph or more through the Columbia River Gorge. PHMSA’s lack of analysis regarding the likelihood and ramifications of tank cars puncturing while traveling 50 mph undermines the rulemaking conclusion that the safety risks are acceptable and comparable with other rail shipments. It seems highly likely that an LNG unit train derailling at 50 mph could lead to the rupture of both inner and outer shells of multiple DOT-113 cars. Yet, PHMSA gives very little analysis to the potential ramifications of this type of high-speed, high-impact derailment and resultant fire and explosion risks. PHMSA fails to adequately evaluate speed limitations on LNG trains. It would be reasonable, for instance, for PHMSA to consider limiting LNG trains to speeds at which LNG tank cars are proven not to puncture. Since this data does not exist, PHMSA should not authorize LNG trains without further tests and study.

We cannot afford to learn through experience the dangers of LNG trains: it is not a risk worth taking in U.S. towns along potential LNG-by-rail routes. At the very least, PHMSA has not

provided a thorough, reasonable analysis to demonstrate that the risk is well-understood and acceptable.

3. PHMSA failed to include any analysis of which rail routes are most likely to be put at risk from LNG trains as a result of this regulatory action.

Not only does PHMSA's cursory analysis not provide any detailed analysis of how an LNG derailment, fire, vapor cloud, or explosion could impact the communities along potential rail routes, but it also fails entirely to consider where these rail routes and communities are located. Indeed, PHMSA's review of the impacts of its proposed regulation does not identify likely rail routes or resources that may be at risk along potential LNG shipping routes. PHMSA's proposed action will likely bring LNG trains close to homes, schools, businesses, small towns and large cities, fire-prone forests, protected waterways, wetlands, and a wide range of critical energy infrastructure resources that remain unaddressed in PHMSA's cursory environmental analysis. In many areas, communities living closest to rail lines are disproportionately made up of minority and low-income populations.<sup>ix</sup>

Additionally, PHMSA fails to acknowledge that local public safety agencies have little recourse in an accident outside of evacuation. The EA gives no detailed information about the distances, timeframe, or other details required for developing a plan for evacuation. PHMSA should evaluate whether cities and other communities along potential routes are prepared to address an LNG train derailment, fire, and potential explosion.

PHMSA should produce a full EIS that addresses how LNG train derailments could impact areas near potential LNG shipping routes. As currently drafted, PHMSA's rule and its supporting environmental analysis fail to describe both the proposed action and its potential consequences. PHMSA's rulemaking sidesteps potential consequences with a blanket assurance that these risks are "similar" to other cryogenic rail shipments, without adequately addressing the volume, frequency or chemical differences from other cryogenic liquids shipped by rail. PHMSA has failed to identify likely LNG shipping routes or potential impacts along these routes.

4. PHMSA has failed to assess the impact of a worst case scenario derailment.

PHMSA fails to assess the impact of a worst case scenario derailment. In fact, PHMSA's analysis stops short of addressing multiple LNG tank car failures occurring in short succession and a potential "cascading failure" of cars in an LNG unit train. PHMSA's analysis states, "In the scenario where multiple DOT-113 specification tank cars are transported in a block or unit train configuration, fire/radiant heat exposure or cryogenic temperature exposure could potentially lead to the release of material or failure of otherwise undamaged tank cars."<sup>1</sup> PHMSA

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<sup>1</sup> Federal Register Notice. October 23, 2019. P. 56974.

does not provide additional analysis of cascading or multiple-car failures. PHMSA's failure to provide adequate analysis of multiple failures of LNG rail cars renders the document completely inadequate for addressing the potential safety, health, economic, and environmental risks of an LNG train accident.

The absence of an adequate safety analysis of multiple LNG car failures also undercuts PHMSA's claim that rail transport of LNG provides a safety advantage over highway transport of LNG. Trucked LNG shipments provide a false comparison with blocks of LNG-laden rail cars, which carry more LNG than LNG trucks. Further, each LNG rail car in a block poses a potential risk to other LNG rail cars in the event of a derailment, spill, and fire. PHMSA's lack of analysis could pose a major threat to the lives and safety of millions of Americans. We urge PHMSA to address this deficiency by developing a full, thorough EIS that evaluates a broad range of potential spill volumes and scenarios, up to and including the release of all LNG contained in an LNG unit train (roughly 3 million gallons).

#### 5. PHMSA failed to address the potential for a Boiling Liquid Expanding Vapor Explosion.

PHMSA fails to address the ramifications of a Boiling Liquid Expanding Vapor Explosion (BLEVE), which could occur in the event of an LNG train derailment. PHMSA asserts that a BLEVE event is "highly unlikely" due to loading pressure requirements, yet PHMSA does not provide analysis that demonstrates how multiple tank cars will fare in a large LNG train derailment. Will LNG cars in an "accordioned" pile really be immune from a BLEVE event, particularly if some of the cars rupture and expose others (which could also be damaged) to severe heat stresses? Without a full safety analysis and a full EIS, PHMSA may be recklessly introducing a BLEVE risk into communities along rail lines throughout the U.S. PHMSA fails to present actual test data for the type of rail shipments the rulemaking would authorize, and PHMSA falls short of providing a reasonable assessment of the BLEVE risks associated with LNG-by-rail.

In the absence of rigorous testing of DOT-113 cars carrying LNG, PHMSA cannot reliably conclude that the pressure relief valves will adequately release rapidly boiling LNG in the event of a derailment and fire that subjects LNG tank cars to severe heat. The pressure relief valves and the conditions for LNG loading may be primarily designed to ensure that LNG trains retain most of their cargo in transit without boiling off too much of the LNG product. Furthermore, the pressure relief valves may become damaged in a derailment. The rail cars valves may be overwhelmed in a situation where an LNG train derails, and the contents of ruptured cars catch fire and subject adjacent cars to severe heat. We urge PHMSA to conduct a full EIS that considers the risk of a BLEVE event.

6. The risks of LNG-by-rail transport are more comparable to the risks of oil-by-rail transport than cryogenic liquid ethylene transport.

PHMSA cites the safe transport of cryogenic liquid ethylene as a precedent, but that is a false comparison. Cryogenic liquid ethylene is not typically shipped in unit trains of 100 rail cars. A more appropriate comparison is a unit train carrying oil, and the history of oil unit train derailments indicates the likelihood of multiple tank cars rupturing in a derailment, though the consequences of a low-lying, easily ignited LNG vapor cloud are more volatile and dangerous than crude oil. The historical safety record of DOT-113 double wall tank cars is also misleading: they have not been used in unit train configurations for LNG transport. Finally, as PHMSA is well aware, railway lines leading to LNG facilities pass through highly populated areas. Conveying large quantities of LNG through these areas is a dangerous gamble, one that could result in fatalities and serious environmental consequences over large areas. PHMSA should conduct a full EIS, relying on more accurate comparable risks.

7. PHMSA failed to consider the climate-change impacts of allowing LNG to be transported by rail.

Finally, PHMSA fails to provide any meaningful analysis of the climate-changing pollution that will result from LNG-by-rail shipments. The proposed rule acknowledges, “PHMSA lacks the expertise to perform a quantitative prediction of how this rulemaking could affect GHG emissions.” PHMSA is not excused from its responsibility to provide a meaningful environmental analysis by virtue of its lack of expertise. Further, the potential consequences of large-scale LNG-by-rail shipments are not impossible to quantify. The resulting increased consumption of LNG, and the potential for increased production of conventional and fracked gas, represent a drastic net increase in greenhouse gas emissions. These impacts overwhelm purported benefits of LNG rail shipments versus LNG truck shipments. Further, PHMSA provides inadequate analysis of the greenhouse gas impacts of LNG production, handling, and shipment, glossing over the tremendous global warming potential of concentrated shipments of methane. Methane has a global warming potential 86 times greater than carbon dioxide over a 20-year timeframe. PHMSA does not provide a detailed analysis of how methane may vent or escape during the different stages of LNG rail transport. PHMSA relies on a generic comparison of different modes of freight transport (comparing a generic truck vs. a generic railcar), with no specific assessment of how LNG-by-rail could lead to releases of methane pollution.

Additionally, PHMSA’s suggestion that transporting LNG by rail will replace transport by truck is inaccurate. PHMSA acknowledges that gas producers seek to send LNG unit trains to LNG export facilities. LNG export facilities, however, are not likely to be supplied via truck. Rather, they are far more likely to be supplied via pipeline. It is unreasonable to assume that, if LNG via

rail were not authorized, that the same volume of LNG would be shipped via truck to LNG export facilities.

PHMSA's omission of any meaningful greenhouse gas analysis of the LNG being considered for shipment, and its false assertion that rail transport will replace truck transport, renders PHMSA's approach incomplete and inadequate for evaluating the impacts of the proposed rule.

## **B. PHMSA Presents an Inadequate Range of Alternatives**

In its alternatives analysis, PHMSA considers just two alternatives to the proposed action: allowing use of the DOT-113C140W railcar and a "no action" alternative. Allowing use of the DOT-113C140W railcar was rejected because of the need for additional analysis; though that is a bit of false alternative given that it would still result in the transport of LNG by rail. The second alternative, the "no action" alternative, is almost entirely centered on the belief that, if PHMSA does not allow LNG to be transported by rail, then it would be transported by truck instead. This discussion is misleading for several reasons. First, the analysis ignores the fact that large volumes of LNG are transported by pipeline. Second, the volumes of LNG likely to be shipped via truck would be far less than the volumes likely moved in large unit trains of LNG; the draft rule does not propose any enforceable limit on the quantity of LNG-by-rail shipments.

LNG-by-rail presents dramatically different safety issues than LNG-by-truck because of the potential for cascading failures between rail cars and the large volume of LNG in blocks of LNG rail cars. PHMSA compares the safety hazards of single LNG trucks to single LNG cars without giving adequate analysis to the dramatic multiplication of risk associated with a string of LNG rail cars or a 100-car unit train. PHMSA's conclusion that LNG trains will "decrease the risks to the public...associated with transporting LNG" is profoundly misleading, and it results from relying on an inappropriate comparison of truck shipments versus rail shipments. It is far more likely that an actual "No Action Alternative" would result in dramatically fewer LNG shipments overall than a simple replacement of LNG rail shipments with truck shipments. PHMSA must re-assess its alternatives analysis to include the potential for pipeline transport and to correct the misleading impression that not allowing LNG transport by rail will result in increased highway transport.

## **Conclusion**

On behalf of Washington Physicians for Social Responsibility, Oregon Physicians for Social Responsibility, Columbia Riverkeeper, Willamette Riverkeeper, 350 PDX, 350 Seattle, 350 Tacoma, Oregon Conservancy Foundation, Rogue Climate, Citizens for a Healthy Bay, Stop Fracked Gas PDX, Climate Action Coalition, The Lands Council, 350 Eugene, Cascadia Wildlands, the University of Oregon Climate Justice League, 350 Eastside, Center for

Sustainable Economy, Washington Environmental Council, Food and Water Action, OneAmerica, Earth Ministry, Washington Interfaith Power & Light and the Power Past Fracked Gas Coalition, we urge PHMSA to withdraw its proposed rule to authorize the shipment of LNG in DOT-113 rail cars. PHMSA's proposal is reckless, poorly-studied, and environmentally unsound. We urge PHMSA to develop a full Environmental Impact Statement (EIS) before considering the proposed rule any further. Alternatively, PHMSA should consider abandoning rulemaking to allow LNG-by-rail shipments altogether.

Sincerely,

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LeeAnne Beres, Executive Director, Earth Ministry/Washington Interfaith Power & Light

Stop Fracked Gas PDX

Climate Action Coalition

350 Tacoma

Cc:

*Congressman Peter DeFazio, Chairman, House Transportation and Infrastructure Committee*

*Oregon Governor Kate Brown*

*Washington Governor Jay Inslee*

*Senator Ron Wyden*

*Senator Jeff Merkley*

*Senator Maria Cantwell*

*Senator Patty Murray*

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<sup>i</sup> Sandia National Laboratories. (March 21, 2018). Review of "LNG Project Spill Consequence Analysis", October 2015.

<sup>ii</sup> Luketa-Hanlin, A. (2006). A review of large-scale LNG spills: Experiments and modeling. *Journal of Hazardous Materials*, A132, 119-140.

<sup>iii</sup> See <https://www.cnn.com/2014/03/31/hundreds-evacuated-after-wash-gas-plant-explosion.html> and <https://www.sightline.org/2016/06/03/williams-companies-failed-to-protect-employees-in-plymouth-lng-explosion/>

<sup>iv</sup> Powell, Tarika. 2016. Sightline Institute. "How Industry and Regulators Kept Public in the Dark After 2014 LNG Explosion in Washington." <https://www.sightline.org/2016/06/03/williams-companies-failed-to-protect-employees-in-plymouth-lng-explosion/>

<sup>v</sup> Concerned Health Professionals of New York, & Physicians for Social Responsibility. (2019, June). Compendium of scientific, medical, and media findings demonstrating risks and harms of fracking (unconventional gas and oil extraction) (6th ed.). <http://concernedhealthny.org/compendium/>

<sup>vi</sup> Parfomak, P. W. (2008, May). Liquefied natural gas (LNG) infrastructure security: Issues for Congress. Congressional Research Service. RL32073. Retrieved from <https://www.hsdl.org/?view&did=486464>

<sup>vii</sup> National Transportation Safety Board. December 5, 2019. Comments in Docket No. PHMSA-2018-0025 (HM-264). P. 6.

<sup>viii</sup> Id. P. 3.

<sup>ix</sup> Multnomah County Oil Train Briefing. January 2016. <https://multco.us/file/48386/download>