ATTACHMENT A

EXPERT REBUTTAL REPORT OF GRAHAM BRISBEN (APR. 8, 2022)

IN THE UNITED STATES DISTRICT COURT
FOR THE WESTERN DISTRICT OF WISCONSIN

BAD RIVER BAND OF THE LAKE SUPERIOR TRIBE OF CHIPPEWA INDIANS OF THE BAD RIVER RESERVATION *Plaintiff,* v. ENBRIDGE ENERGY COMPANY, INC., and ENBRIDGE ENERGY, L.P. *Defendants*	Case No. 3:19-cv-00602-wmc Judge William M. Conley Magistrate Judge Stephen L. Crocker
ENBRIDGE ENERGY COMPANY, INC., and ENBRIDGE ENERGY, L.P. *Counter-Plaintiff*, v. BAD RIVER BAND OF THE LAKE SUPERIOR TRIBE OF CHIPPEWA INDIANS OF THE BAD RIVER RESERVATION and NAOMI TILLISON, in her official capacity *Counter-Defendants*	

EXPERT REBUTTAL REPORT OF

GRAHAM BRISBEN

April 8, 2022

Note: Portions of this report may contain information designated as confidential by Enbridge pursuant to the stipulated protective order in *Bad River Band of the Lake Superior Tribe of Chippewa Indians of the Bad River Reservation v. Enbridge Energy Company, Inc.*, Case No. 3:19-cv-00602-wmc (Dkts. 49, 50).

1. My name is Graham Brisben. I am the CEO and founder of Professional Logistics Group, Inc. ("PLG Consulting"). PLG Consulting is a leading logistics and supply chain consulting firm, which helps shipper, carrier, and private equity clients improve operations, reduce costs, penetrate markets, mitigate risk, and invest wisely. My expertise includes all surface modes of transportation, including rail, truck, marine, pipeline, intermodal, and warehouse and distribution. I founded PLG Consulting in 2001.
2. Since 2014, I have also been Managing Partner for FourFront Strategies, LLC, where I have focused on deal sourcing, thesis development, and actionable investment opportunities in transportation, logistics, and industrial services businesses.
3. From 2017 to 2020, I served on the Board of Directors for Appalachian Railcar Services, LLC, a leading national provider of railcar repair, storage, switching, and related services. Appalachian Railcar Services has a network of over 20 shops, including four tank car-certified locations across the Midwest and Eastern United States.
4. Prior to founding PLG consulting, from 1997 to 2001, I was District General Manager at Quality Carriers, Inc./Chemical Leaman Tank Lines, where I managed a multi-state region for trucking, transloading, and packaging bulk commodities, including rail/truck transfer and transportation of plastic resins and other dry bulk commodities. I was also responsible for operations, sales, marketing, P&L, driver recruitment, and safety for my region.
5. From 1993 to 1996, I held positions at Burlington Northern Santa Fe Railway/Burlington Northern Railroad (BNSF) as an Analyst at Corporate Headquarters and a Trainmaster at the Ft. Worth, St. Louis, and Chicago Terminals. While an Analyst at BNSF, I supported the operating department in locomotive asset deployment, train scheduling, and capacity management.

6. I have 30 years of experience in rail transportation and truck transportation, logistics procurement; supply chain management; market analysis; business strategy; due diligence; chemicals; oil and gas; and bulk commodities. I frequently present on the logistics of transporting energy resources and the opportunities and challenges associated with shipping by rail.

7. I earned a Bachelor of Arts (B.A.) degree in English from the University of Iowa.

8. My CV is at Exhibit 1.

9. I have not authored articles for third-party publications in the past ten years.

10. Within the previous four years, I have served as an expert witness at trial or by deposition in one matter: *Maalt, LP v. Sequitur Permian, LLC*, Case No. 20-04064-ELM (U.S. Bankruptcy Court for N.D. of Texas).

11. I am being compensated at $350 per hour for my work on this matter. My compensation in no way depends on the outcome of this case.

12. The Bad River Band of the Lake Superior Tribe of Chippewa Indians of the Bad River Reservation (the "Band" or "Plaintiff") has filed a suit seeking a declaratory judgment that Enbridge's continued use of Line 5 across the Bad River Reservation constitutes a public nuisance and a trespass, and an order of ejectment and an injunction requiring Enbridge to cease the operation of Line 5 on the Reservation and to remove it safely from the Reservation.[1]

13. I have been asked by the Band to review the expert reports submitted on January 31, 2022, by William J. Rennicke from Oliver Wyman Inc. and Neil Earnest from Muse Stancil, and to

[1] Third Amended Complaint at 60, *Bad River Band of the Lake Superior Tribe of Chippewa Indians of the Bad River Reservation v. Enbridge Energy Company, Inc.*, Case No. 3:19-cv-00602-wmc (W.D. Wisc.).

provide any rebuttal opinion with respect to Mr. Rennicke's and Mr. Earnest's analysis of the availability and feasibility of alternative transportation options to the movement of crude oil and natural gas liquids on Line 5.

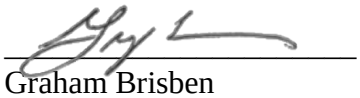
14. A complete statement of the opinions that I will express in this matter and the basis and reasons for them can be found in Exhibit 2. I have been supported in my work on this matter by PLG Consulting's consultants.

15. The exhibits that I will use to summarize or support them can also be found in Exhibit 2.

16. A list of materials that I have considered in forming the opinions for this report can also be found in Exhibit 2.

17. My Expert Rebuttal Report, and the opinions expressed in it, are based on my analysis of the information and materials available to me as of April 8, 2022. As new information becomes available, I reserve the right to supplement and amend my opinions as necessary.

I declare under penalty of perjury that the foregoing is true and correct.



Graham Brisben

April 8, 2022

EXHIBIT 1

GRAHAM BRISBEN

Founder and CEO

www.plgconsulting.com
Phone: +1 312.957.7757

Professional Profile

Graham is the CEO and founder of Professional Logistics Group, Inc. (PLG Consulting), a logistics and supply chain consulting firm focused on the industrial economy and all surface modes of transportation. He formed the firm in 2001 following a career in the railroad and trucking industries, where his various operations and business development roles helped to identify the market need for objective, expert consulting services for shippers, transportation companies, investors, government entities, and other stakeholders in the world of logistics.

Professional Experience

FOUNDER AND CEO
PLG Consulting
2001 – Present

DISTRICT GENERAL MANAGER
Quality Carriers, Inc. /Chemical Leaman Tank Lines
1997 – 2001

ANALYST, Corporate Headquarters
TRAINMASTER, Ft. Worth, St. Louis, Chicago Terminals
Burlington Northern Santa Fe Railway/Burlington Northern Railroad
1993 – 1996

Areas of Expertise

Business Leadership	**Rail**	**Energy**
Truck	**Chemicals**	**Business Strategy**
Due Diligence	**Market Analysis**	**Terminals**

Education

- BA – University of Iowa

Selected Accomplishments

- Started brand new logistics consulting firm from scratch, growing from one person to over 200 clients and 45 industry experts serving the chemicals, oil & gas, mining & minerals, manufacturing, agricultural, renewables, surface transportation, government, and private equity sectors.
- Developed new trucking, warehousing, and rail transloading operations from the ground-up in four new markets, including driver hiring, operating procedures, new business development, and meeting revenue and profitability goals.
- Developed written company-wide standard operating procedures for bulk truck drivers handling a variety of commodities.
- Worked with Canadian National Railway to open new bulk transloading facilities in Chicago, IL and Hamilton, ON.
- Created process and model to maximize loaded miles of bulk truck operations spanning the US and Canada.
- Achieved highest safety record among all terminals company-wide for two consecutive years.
- Developed new railroad yardmaster and train crew performance metrics to align rail terminal operations with corporate goals.

Articles, Presentations & Speaking Engagements

- “Energy & Materials in the Age of Decarbonization: Implications for Rail,” Rail Equipment Finance Conference, La Quinta, CA, March 2022
- “Navigating in a Volatile World: Chemicals, Plastics, & Polymers Pricing and Supply Trends,” AWA Global Release Liner Conference & Exhibition, Chicago, IL, November 2021

GRAHAM BRISBEN

Founder and CEO

Articles, Presentations & Speaking Engagements (continued)

- "Reshaping the Chain: Supply Chain Update," Southwest Association of Rail Shippers Annual Meeting, San Antonio, TX, March 2021
- "Capturing a Decade of Opportunity: Anticipating and Understanding Supply Chain Evolutions," Railroad Financial Corporation virtual presentation, March 2021
- "North American Energy Update: Opportunities and Challenges for Rail in Upstream, Refining, Chemicals and Renewables," Rail Equipment Finance Conference, La Quinta, CA, March 2020
- "Updated: From Upstream to Downstream: Opportunities and Challenges for Rail," North American Rail Shippers Association Annual Meeting, San Antonio, TX, May 2019
- "Crude-by-Rail and Refined Products Transport Infrastructure," Bank of America Merrill Lynch 2019 Transportation and Industrials Conference, Boston, MA, May 2019
- "From Upstream to Downstream: Opportunities and Challenges for Rail," Rail Equipment Finance Conference, La Quinta, CA, March 2019
- "From Drilling to Downstream: Opportunities and Challenges for Rail," Rail Equipment Finance Conference, La Quinta, CA March 2018
- "The Future Has Arrived: Petrochemicals and Energy by Rail," Southwest Association of Rail Shippers, San Antonio, TX, February 2018
- "North American Energy Insights," North American Rail Shippers Association annual meeting, San Francisco, CA, May 2017
- "The Changing Landscape for Energy: Shale Oil & Gas Outlook," Southwest Association of Rail Shippers, Dallas, TX, October 2015
- "The North America Energy Revolution: Implications for Rail," The Rail Summit – Supply Chain Conference, Chicago, IL, April 2015
- "The North America Energy Revolution: Implications for Rail," Rail Equipment Finance Conference, La Quinta, CA, March 2015 and Union League Club, Chicago, IL, February 2015
- "Moving Crude Oil by Rail," Transportation Research Board 94th Annual Meeting, Washington, D.C., January 2015
- "Shale Development: The Evolving Transportation Impacts," The Rail Summit, Chicago, IL, June 2014
- "Shale Development: The Evolving Transportation Impacts," Rail Equipment Finance Conference, La Quinta, CA, March 2014
- "Crude by Rail Report," Stifel Capital Markets conference call, December 2013
- "Crude by Rail Report," Rail Trends conference, New York, NY, November 2013
- "Oil & Natural Gas: The Evolving Freight Transportation Impacts," CIT Rail Resources Conference, Jackson Hole, WY, July 2013
- "Oil & Natural Gas: The Evolving Freight Transportation Impacts," GE Capital – Q3 All Employee Meeting, Chicago, IL, July 2013
- "Oil & Natural Gas: The Evolving Freight Transportation Impacts," Midwest Association of Rail Shippers, Lake Geneva, WI, July 2013
- "Oil & Natural Gas: The Evolving Freight Transportation Impacts," FTR State of Freight Summit, Chicago, IL, May 2013
- "Shale Development in Argentina: The Evolving Supply Chain," Frac Supply Chain Summit, Buenos Aires, Argentina, April 2013
- "Oil & Natural Gas: The Evolving Freight Transportation Impacts," Rail Equipment Finance Conference, La Quinta, CA, March 2013
- "Mapping the Current Proppants Transportation Infrastructure," Proppants Summit, Denver, CO, July 2012

EXHIBIT 2

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Commentary, Evaluation, and Rebuttal Regarding Selected Expert Reports in the Matter of

BAD RIVER BAND OF THE LAKE SUPERIOR TRIBE OF CHIPPEWA INDIANS OF THE BAD RIVER RESERVATION, *Plaintiff,* v. ENBRIDGE ENERGY COMPANY, INC., and ENBRIDGE ENERGY, L.P., *Defendants*

Prepared by
Professional Logistics Group, Inc. d/b/a PLG Consulting, Chicago, IL USA

April 8, 2022

Purpose of this Report

PLG Consulting has been asked to evaluate and comment on the opinions provided within the expert report written by Mr. William J. Rennicke of Oliver Wyman ("Rennicke Report") and, to a lesser extent, the report of Mr. Neil Earnest of Muse Stancil ("Earnest Report") dated January 31, 2022 and submitted in the litigation between Bad River Band of the Lake Superior Tribe of Chippewa Indians of the Bad River Reservation ("Bad River Band") vs. Enbridge Energy Company, Inc. and Enbridge Energy, L.P. ("Enbridge").

The litigation between the Bad River Band and Enbridge concerns the Bad River Band's discontinuance of easement rights previously granted to Enbridge for the route of its Line 5 pipeline through the Bad River Reservation. The Rennicke Report has made certain statements and claims as to "the impacts of the Line 5 shutdown requested by the Bad River Band, if that relief were to take effect before the rerouting of Line 5 being sought by Enbridge becomes operational, assuming it does, so that Line 5 no longer crosses the Bad River Band's Reservation."[1] The Earnest Report likewise advances various opinions regarding the impacts of a Line 5 shutdown.

For the avoidance of doubt, PLG is not opining on the underlying issues of the litigation. PLG is only providing opinion and commentary regarding specific statements made by the Rennicke Report concerning the availability and/or operational feasibility of alternative delivery and supply chain scenarios for crude oil and natural gas liquids (NGLs) in the event that Line 5 is unable to continue operating through the Reservation. PLG is also providing commentary in this report on certain claims made by the Earnest Report regarding matters within PLG's expertise of energy transportation and logistics.

PLG's evaluation of Rennicke Report and Earnest Report statements is presented in the following report and is based on our nearly twelve years of involvement with oil, gas, and natural gas liquids (NGL) supply chains in North America. PLG is and has been actively engaged across all North American tight oil plays, refining markets, and energy transportation modes inclusive of truck, rail, marine, pipeline, and terminalling through the performance of numerous market analyses, operations, procurement, optimization, business strategy, network design, and due diligence engagements within the industry.

Founded in 2001, PLG provides logistics and supply chain consulting for the industrial economy, with core verticals that include oil and gas and all surface transportation modes. Since the advent of the "shale revolution" in 2010, PLG has been engaged in multiple projects relating to the subject matter of hydrocarbon supply chains on behalf of the full range of industry participants and stakeholders therein, including shippers, carriers, terminal operators, railcar lessors, banks, government entities, and private equity firms. PLG's representative project experience in the area of energy logistics includes but is not limited to:

- Supply chain design and implementation
- Rate negotiations
- Loading and unloading terminal design and operations planning
- Tank car acquisition, mechanical specification, and pre-delivery inspection
- Volume and railcar demand forecasts
- Operational and commercial due diligence on energy terminals.

[1] REPORT OF WILLIAM J. RENNICKE, January 31, 2022, page 2

In addition, starting in 2014 the United States Department of Energy's Energy Information Administration (EIA)[2] engaged PLG to develop and implement a methodology for the tracking of crude oil and other energy product flows by rail in the US. The solution PLG invented required special access to US Surface Transportation Board (STB) and Association of American Railroads (AAR) data and development of models to analyze and report origins, destinations, interchange points, and both historical and forecasted movements of crude, NGLs, ethanol, biodiesel, petcoke, asphalt, and other energy related products. Today, under this ongoing engagement PLG provides the backbone and methodology of all of EIA's monthly PADD[3]-level energy-by-rail reporting. Additional relevant background and credentials of the firm may be found in Appendix B.

PLG confirms its independence from the Bad River Band of the Lake Superior Tribe of Chippewa Indians of the Bad River Reservation, Enbridge Energy Company, Inc., Enbridge Energy, L.P., as well as their legal advisors. This report and its conclusions are based on the materials that PLG has been provided to-date. PLG reserves the right to supplement this report and to expand or modify opinions based on review of additional material as it becomes available through ongoing discovery and/or through any additional work or review of additional work performed by others.

[2] The EIA is the principal agency of the U.S. Federal Statistical System responsible for collecting, analyzing and disseminating energy information for sound policymaking, efficient markets and public understanding of energy and its interaction with the economy and environment.

[3] Petroleum Administration for Defense Districts (PADDs) were created under the Defense Production Act of 1950 and are Federally-designated geographic aggregations of the 50 states and the District of Columbia that enable regional analysis of petroleum product supply and movements.

Table of Contents

I. Introduction and High-Level Observations

As our report lays out, PLG has evaluated claims and statements made by Mr. Rennicke and, to the extent that they fall within our areas of expertise, Mr. Earnest regarding the availability and/or operational viability of alternative logistical options to Line 5 deliveries of crude oil to Michigan, Ohio, Pennsylvania, Quebec, and Ontario refineries and deliveries of NGLs to various markets (specifically, butane and propane to Sarnia, Ontario and propane to northern Wisconsin and the Upper Peninsula of Michigan).

Our high-level observations are as follows:

1. Both Mr. Rennicke and Mr. Earnest make a very specific assumption in their reports that the prospective shutdown of Line 5 would be sudden but temporary. Both assume that the prospective shutdown would only last a "relatively short period of time"[4] or as long as a proposed 41-mile re-route around the Reservation takes to get permitted and built.

2. By assuming that a shutdown occurs suddenly, both authors present consequences that are dramatic and dire. In addition, this premise leads Mr. Rennicke in particular to make some strong declarative statements about absolute unavailability and in some cases impossibility of alternative logistics scenarios for Line 5 products and markets.

3. However, if a transition is to be made to a permanent future state wherein Line 5 does not operate through or around the Reservation (in essence, a Line 5 that is idled between Superior, WI and Lewiston, MI), an orderly process could be undertaken in which a "re-plumbing" of the sourcing, flow, and delivery of crude and NGLs for the affected regions takes place. Such continuous "re-plumbing" of the flows of crude and refined products has become a hallmark of the ever-changing energy landscape within North America, especially since the current "tight oil" era began around 2010 that triggered major changes in energy commodity flows.

4. Perhaps because of its "going in" temporal assumptions, the Rennicke Report is problematic in several ways. As detailed below, we have identified areas in which the Rennicke Report contains factual errors, missing context, false assumptions, logical fallacies, and/or specious reasoning. In some cases, these identified problems apply whether or not a "sudden and temporary" or "permanent future state" is assumed regarding the cessation of Line 5 operations through the Reservation. PLG's approach taken below is a walk-through of the Rennicke Report wherein statements are excerpted and we provide our comments and/or rebuttals with supporting exhibits (Section II).

5. Additionally, there are various instances in which similar problems exist within the Earnest Report, and we have provided commentary accordingly (Section III).

6. The Rennicke Report, and in certain regards the Earnest Report, takes a rather staunch and absolute position that alternative logistics solutions for Line 5 products and markets are either unavailable or operationally infeasible. However, statements made in the Rennicke Report taking this position often rely

[4] Muse Stancil, *Expert Report of Neil K. Earnest*

on faulty information, facts, assumptions, and/or reasoning. More importantly, PLG's analysis and rebuttal of these statements are accompanied with identification of specific logistics solutions and options relevant to each statement topic. Our report concludes with a summary (Section IV) of the myriad potential alternative supply chain solutions across the full range of present day Line 5 destinations and products that are both available and operationally feasible.

II. Page-by-Page Opinion, Commentary, and Rebuttal Regarding the Rennicke Report

Provided below is a sequential page-by-page review of content and statements within the Rennicke Report that PLG believes warrant comments and/or rebuttal. We have provided page references plus verbatim excerpts of the content/statements in question, followed by our observations.

In some cases, the Rennicke Reports repeats the same information and opinions in multiple areas of the report, particularly in both executive summary and main body sections. PLG has attempted to provide its comments proportionally for each section/area in which statements and arguments are repeated.

From page 3 of the Rennicke Report:

> *"This shortfall [in product from the shutdown of Line 5]* ***could not be satisfied*** *by any alternate means of transportation, including rail, barge, or truck."*

PLG comments: The Rennicke Report sets forth a staunch and absolute position that any and all alternative supply chain options for Line 5 products and markets are either impossible to implement or do not exist. As we present in the following commentary and rebuttal, this very "black and white" view of the hydrocarbon energy logistics ecosystem within North America is simply incorrect.

From page 5 of the Rennicke Report:

> *"Moreover, investors are unlikely to be willing to fund the construction of tank cars for such a limited use."*

PLG comments: Tank cars have many potential uses after being in crude oil and NGL service, and it is a false assumption to presume that any new car construction would only be done with one potential business opportunity in mind given the 50-year life of those assets. Crude oil railcars can be cleaned and moved into ethanol, diesel, jet fuel, gasoline, and other products. A detailed analysis of the North American crude and NGL-eligible tank car fleet is provided later in this report.

From page 11 of the Rennicke Report:

> *"Enbridge is constructing a 41-mile reroute that will bypass the Bad River Band Reservation. This bypass is currently undergoing permitting at state and federal levels. Even if permitting delays construction for a year or more beyond 2023, my conclusions remain the same, as this additional delay would not be material to my conclusions summarized herein."*

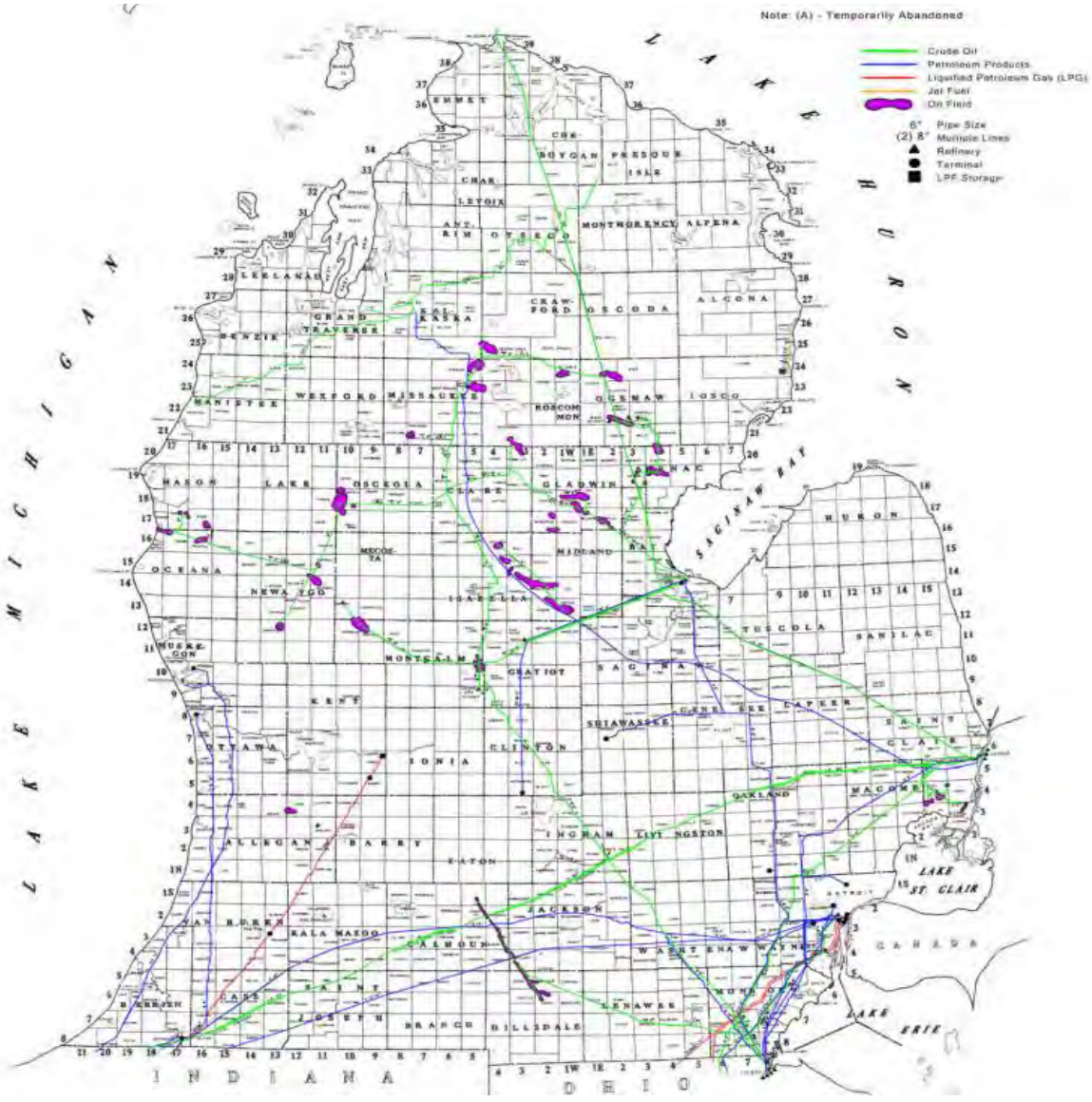
PLG comment: It appears that the Rennicke Report was written on the presumption of Line 5 being back online around 2023-2024, which affects the Report's assumptions on infrastructure investments.

From page 13 of the Rennicke Report:

> *"Line 5 receives Michigan-produced light crude oil via a pipeline system and by truck at Lewiston. In the event Line 5 is shut down, this light oil crude would either need to be moved by truck to southern Michigan or Sarnia to enter the pipeline system or be shipped directly to a refinery"*

PLG comment: There are other crude oil gathering pipelines in the area that could be utilized to reduce the amount of trucking of crude oil required in the event of a Line 5 shutdown, as illustrated by the bright green lines in Figure 1.

Figure 1



Source: Michigan Public Service Commission

From page 17 of the Rennicke Report:

> *"Theoretically, product could be transshipped from pipeline to other modes at Superior.*

However, there are no transshipment facilities at Superior and constructing such facilities would be expensive and time-consuming. Therefore, it is likely that the shippers would consider originating the rail or truck shipments at Edmonton, where transshipment facilities could be available."

PLG comments: This statement is problematic on several counts:

1. It presumes that all the replacement volume for Line 5 products and markets would still come from Western Canada, which is not a sound assumption. Other potential supply sources include the Bakken shale play, waterborne movements to eastern refineries, the Utica shale play, and Texas.

2. Here appears one of the first of many times in which long-distance trucking scenarios from Edmonton to Sarnia (and various other origin-destination pairs) are discussed, but this is ultimately a straw man argument because no market player would seriously consider or attempt to establish such operations. Apart from being obviously impractical, there are multiple other options shippers would explore first (such as maximizing available capacity on the Enbridge system outside of Line 5).

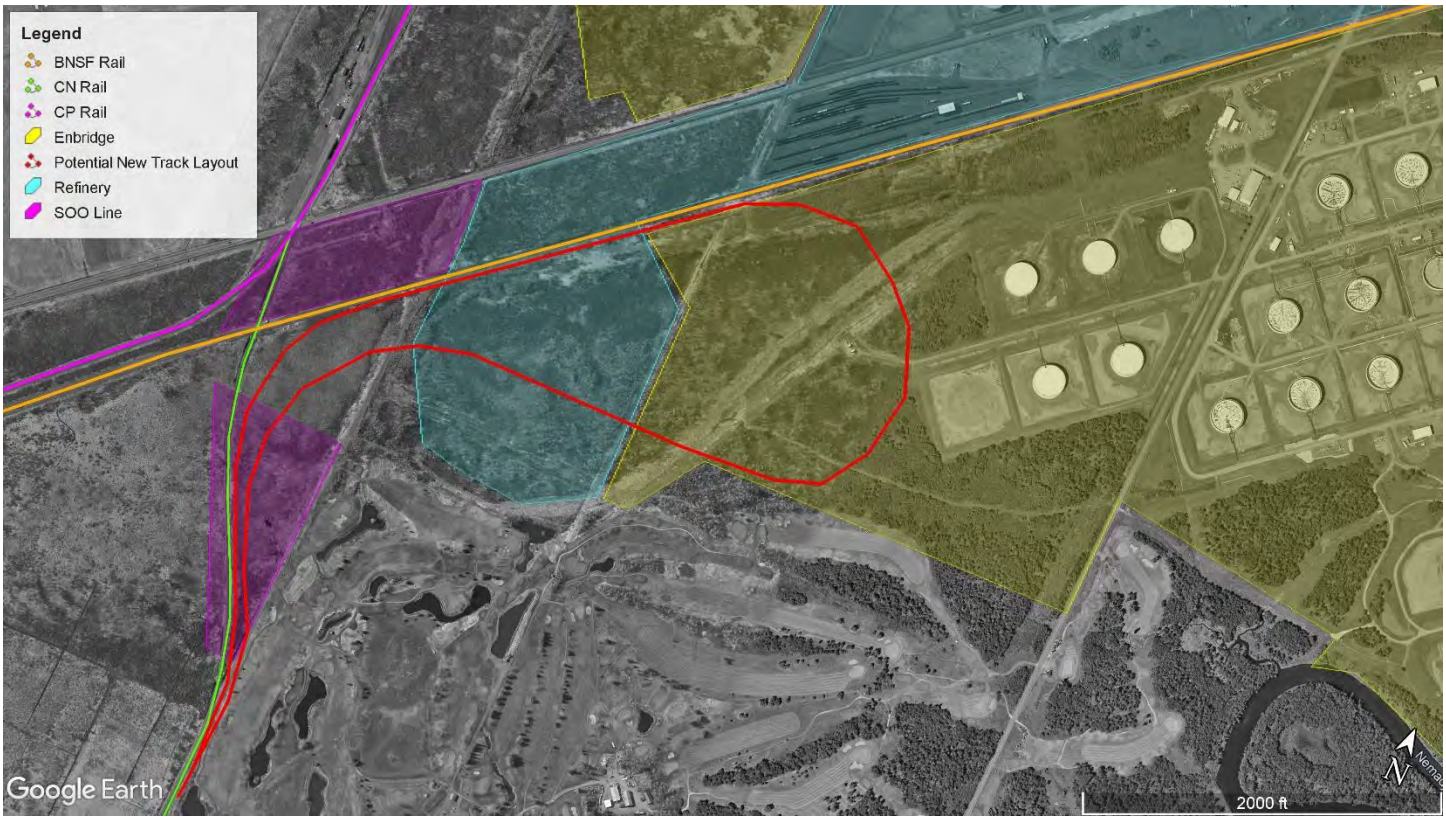
3. The Enbridge Superior Terminal in Superior, WI is a potential location for originating crude and NGL shipments by rail. The property currently does not have active rail service but historically had rail on it as indicated by satellite imagery in Figure 2 showing a switch and industrial lead running into the property from the Burlington Northern Santa Fe Railway (BNSF) main line in the red box. BNSF interchanges with Canadian National Railway (CN) at multiple locations, including Chicago, and CN can deliver crude oil and NGLs to Sarnia, Detroit, and Toledo.

Figure 2

Source: Google Earth, Image date 5/7/2016, PLG Analysis (red box)

The Enbridge Superior Terminal also has the potential for connecting to the CN main line, which would create an option for a single-line (carrier) move to Sarnia, ON. There also is potential for putting in enough track to have a unit train facility as seen in Figure 3 which is a potential track illustration of approximately 12,000 feet that is mostly on property of Enbridge and the Cenovus refinery. A ladder track (side-by-side tracks) layout is also a possibilty instead of the "teardrop" loop-style layout. Another potential way to enable rail access to Enbridge Superior Terminal is to partner with Cenovus Refinery by extending their ladder track on Cenovus' property and installing a pipeline to connect the refinery to Enbridge's terminal (assuming it is not already pipeline connected).

Figure 3



Source: Google Earth, Douglas County, WI Land Records, PLG Analysis

From page 19 of the Rennicke Report:

> *"Second, there is a lack of unloading and loading terminals. While it may be theoretically possible to load trains in Edmonton and build unloading racks and infrastructure in Sarnia and other refinery locations capable of handling up to eight loaded and empty 100-plus car unit trains per day, this would not occur for some years in practice, because it would be hard to find enough land and impossible to obtain required environmental permits"*

PLG comments: This statement is problematic on multiple counts:

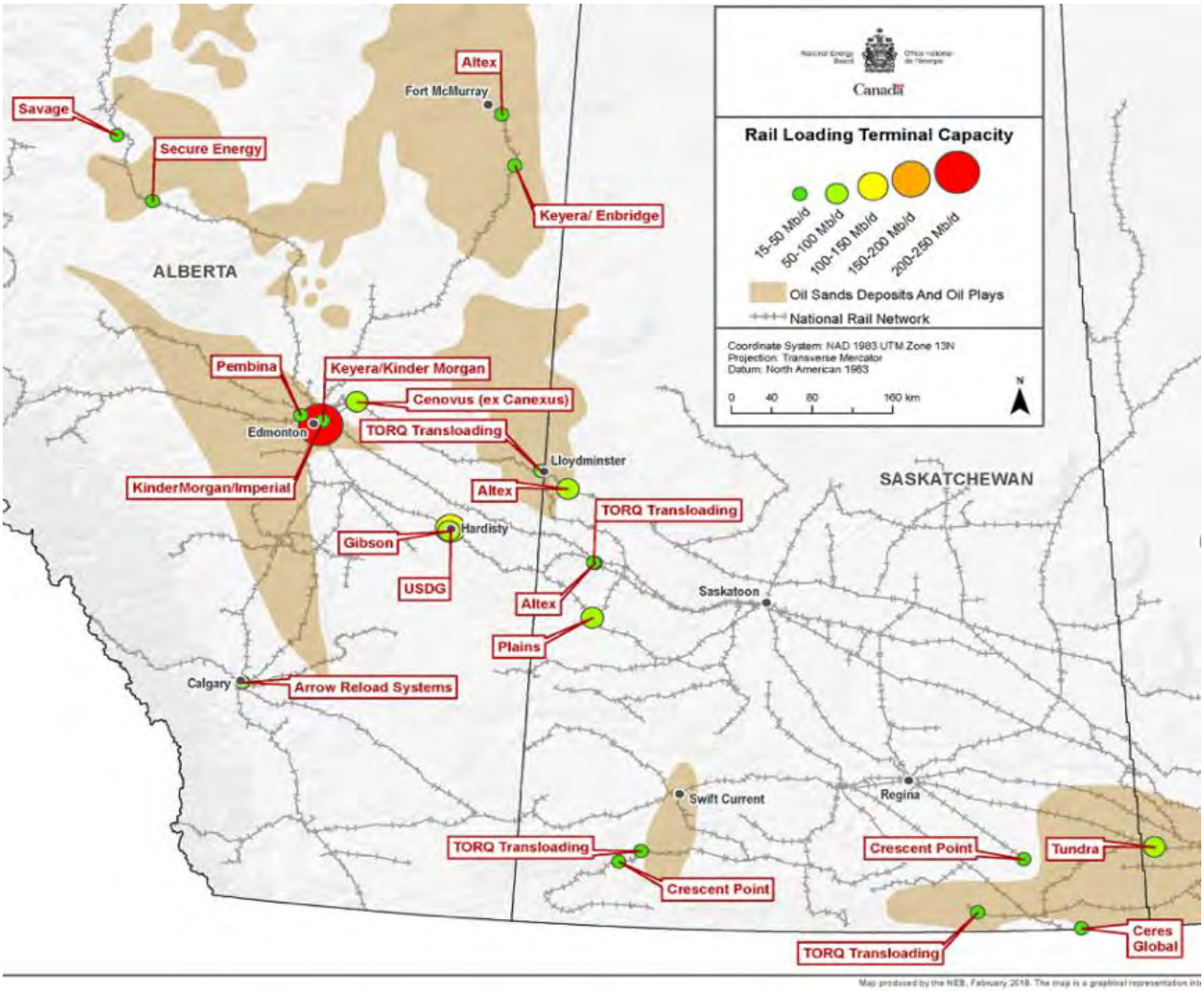
1. First, this statement continues to falsely assume that all product would need to continue to come from Western Canada in the event of a Line 5 shutdown.

2. Secondly, the Rennicke Report statement that there is a "lack of…loading terminals" is simply false. Especially when not just Western Canada but other supply origins are considered, the availability of loading terminals is vast. To illustrate:

    a. Even if it were assumed that all supply would continue to come from Western Canada, there is significant crude by rail loading capacity not just in Edmonton but also throughout Alberta as illustrated in Figure 4. In 2018, there were approximately 1.2 million barrels per day of crude rail loading capacity in Western Canada. There have been expansions since 2018, including U.S. Development Group's Hardisty, Alberta terminal expanding to a capacity of ~270 kbpd (thousand barrels per day). As we discuss later, these

terminals have historically seen much higher volume throughput than would be required by a hypothetical additional loadout requirement generated by a Line 5 shutdown.

Figure 4

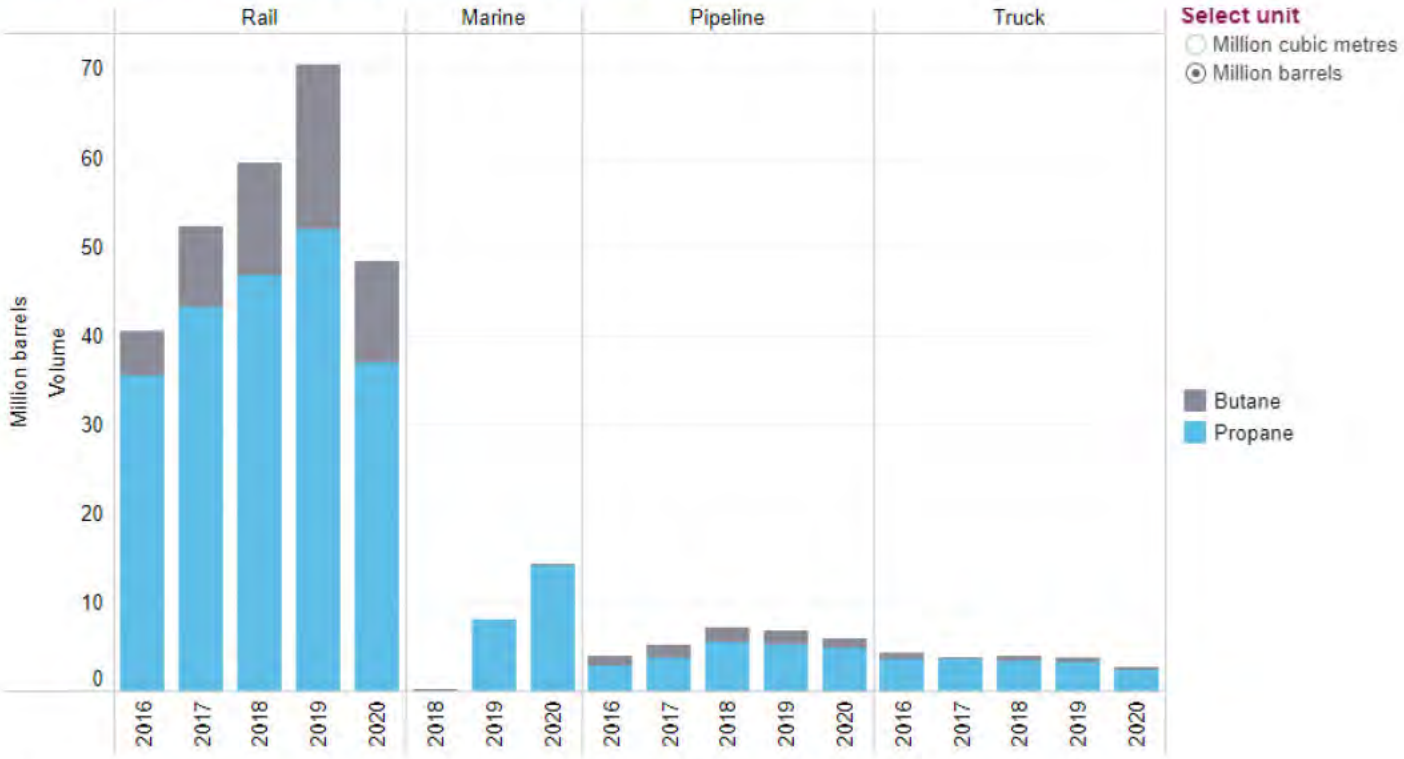


Source: Canada Energy Regulator, 2018

There is also significant propane and butane rail loading in Western Canada. One example is the Pembina Redwater, AB propane unit train facility, which can ship 105-car trains.[5] The majority of propane and butane exports from Canada already move by rail as illustrated in Figure 5, so increasing rail volumes from Canada if necessary would be a viable option.

[5] https://www.pembina.com/media-centre/news/details/135455/

Figure 5: Canada 2020 Propane and Butanes Exports by Mode of Transportation



Source: Canada Energy Regulator's Propane and Butanes Annual Export Summary – 2020

b. The Bakken shale play is another potential source for loading crude by rail in the event that current Line 5 refiners choose to be supplied by that product. The Bakken has a large amount of crude by rail loading capacity that is presently underutilized. Bakken rail loading capacity is 1,230,000 bbls/day,[6] while actual rail loadings were only 140,000 bbls/day for January 2022 (latest month available).[7]

There is also significant NGL loading in the Bakken shale play, including unit train capability. For example, Marathon has a unit train-loading terminal in Fryburg, ND that is capable of handling propane.[8]

c. The Marcellus and Utica shale regions have seen significant growth in their production of NGLs and NGL processing capabilities. Figure 6 illustrates the signifcant growth of just propane in the two PADDs that include Marcellus/Utica. An example of significant infrastructure in the Marcellus/Utica is MPLX (master limited partnership formed by Marathon Petroleum Corporation) that has 531 kbpd of C2+[9] fractionation capacity in Marcellus and Utica, as illustrated in Figure 7.

[6] ND Pipeline Authority, *Oil Transportation Table*, September 2021
[7] ND Pipeline Authority, *Estimated ND Rail Export Volumes*, January 2022
[8] https://rbnenergy.com/long-train-runnin-part-2-the-economics-of-bakken-to-mexico-propane-unit-trains
[9] Mixture of ethane, propane, butanes, and pentanes

Figure 6

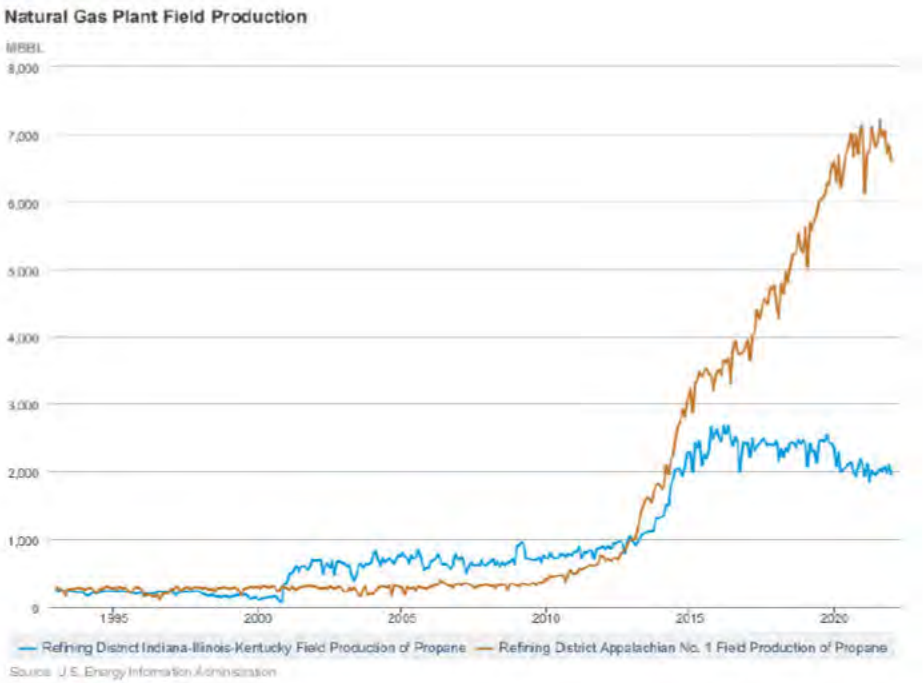


Figure 7

Marcellus Operations

Gathering Capacity	***1.4 bcf/d***
Houston System	1.2 bcf/d
Bluestone System	0.2 bcf/d
Processing Capacity	***5.3 bcf/d***
Bluestone Complex	0.4 bcf/d
Houston Complex	0.7 bcf/d
Majorsville Complex	1.3 bcf/d
Mobley Complex	0.9 bcf/d
Sherwood Complex	2.0 bcf/d
C2+ Fractionation Capacity	***311 mbpd***
Bluestone Complex	81 mbpd
Houston Complex	100 mbpd
Majorsville Complex	80 mbpd
Mobley Complex	10 mbpd
Sherwood Complex	40 mbpd

Utica Operations

Gathering Capacity	***2.4 bcf/d***
Ohio Gathering System	1.1 bcf/d
Jefferson Gas System	1.3 bcf/d
Processing Capacity	***1.3 bcf/d***
Cadiz Complex	0.5 bcf/d
Seneca Complex	0.8 bcf/d
C2+ Fractionation Capacity	***220 mbpd***
Cadiz Complex	40 mbpd
Hopedale Complex	180 mbpd
Condensate Stabilization	***23 mbpd***
Ohio Condensate	23 mbpd

Source: MPLX.com

Before even considering the Marcellus/Utica rail loadout capability, two pipelines originate in Marcellus/Utica that currently transport ethane (an NGL) to Sarnia. One of these pipelines is the Utopia East pipeline, which was designed to transport ethane and an ethane-propane mixture. It currently has a capacity of 50 thousand barrels per day (kbpd), but Kinder Morgan has stated that the pipeline is expandable to more than 75 kbpd.[10] Adding propane to this pipeline and expanding the pipeline capacity would be a very efficient transportation mode to supply Sarnia.

[10] https://ir kindermorgan.com/news/news-details/2016/Kinder-Morgan-Generates-More-Than-12-Billion-of-Distributable-Cash-Flow-for-First-Quarter-2016/default.aspx

Marcellus/Utica also has significant rail loading infrastructure that is underutilzed. An example of that rail loading infrastructure is MPLX's 835+ railcar spots and 108 railcar loading racks as illustrated in Figure 8. The rail loading infrastructure was built to support export of NGLs off the East Coast prior to the construction of pipelines to facilitate those movements (in particular, the expansion of the Mariner East pipeline system). However, once the Mariner East 2 pipeline came online in 2018 with a capacity of 275 kbpd[11], volume of rail loadings out of the Marcellus/Utica shale play was reduced. This decline in rail loadings is demonstrated in Figure 9 and Figure 10 charts illustrating NGL shipments from PADD 1 AND PADD 2 (which both cover the Marcellus/Utica). The net effect of these volumes shifting from rail to pipe is the freeing up of significant rail loadout capacity from existing terminals in the region.

Figure 8

NGL MARKETING INFRASTRUCTURE

	Hopedale	Houston	Keystone	Siloam
	NGL Marketing			
Capacity	120,000 Bbl/d C3+	100,000 Bbl/d C2+	26,000 Bbl/d C2+	26,000 Bbl/d C3+
Truck Logistics	12 loading racks & 2 unloading racks	12 loading racks & 2 unloading racks	6 loading racks	6 loading racks & 4 unloading racks
Rail Logistics	475 railcar siding terminal with 64 loading racks	230+ railcar siding terminal with 24 loading racks	50 railcar siding with 6 loading racks	80+ railcar siding terminal with 14 loading racks

Source: Markwest (acquired by MPLX) 2015 Investor & Analyst Day Presentation

Figure 9

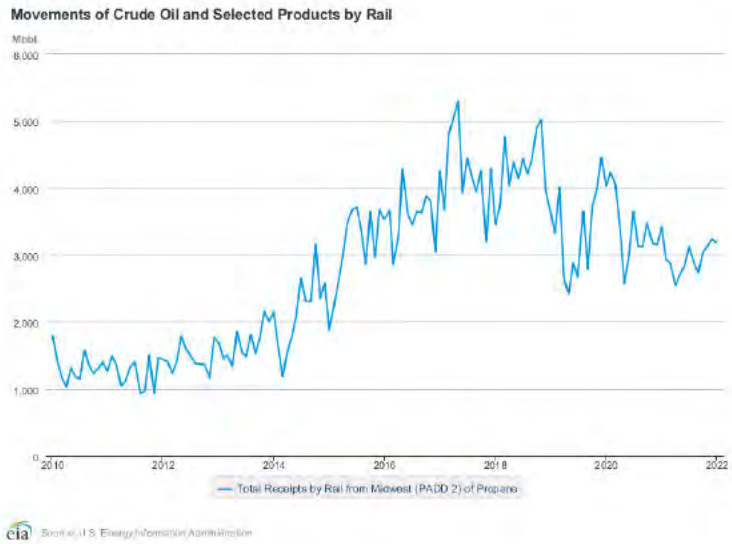
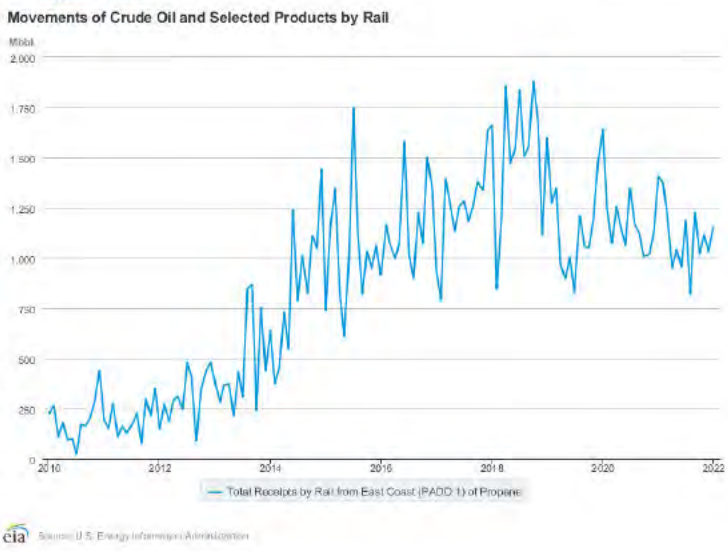


Figure 10



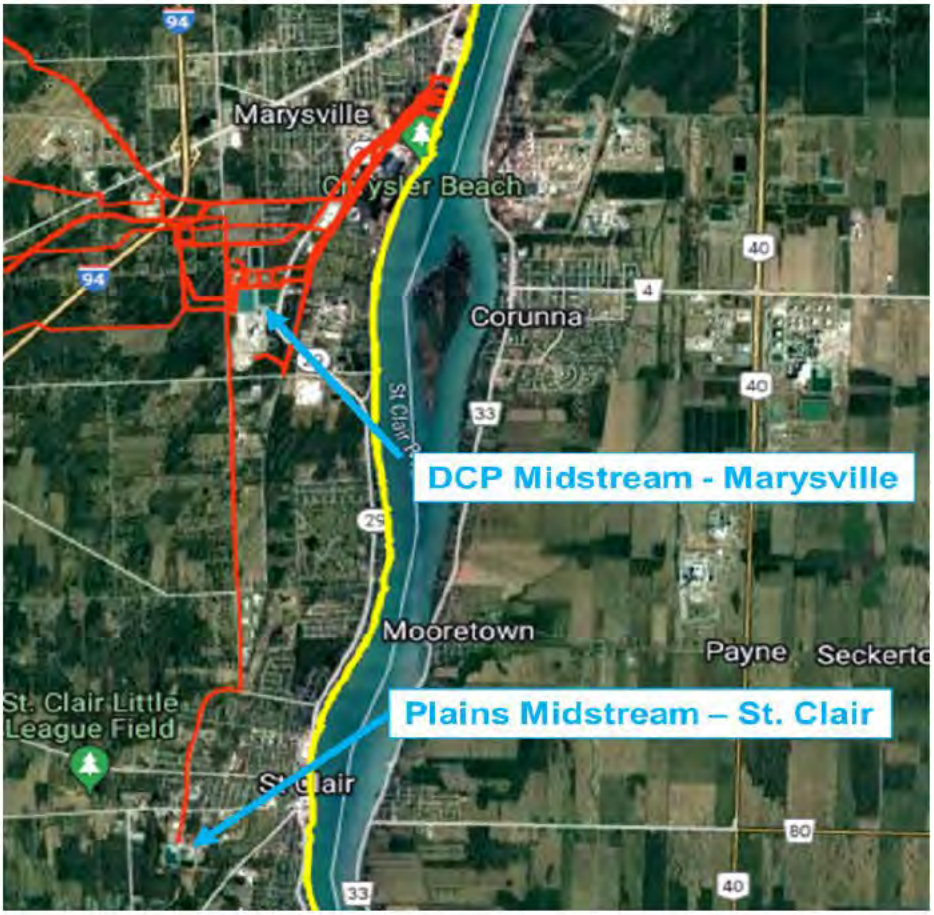
[11] https://www.hydrocarbons-technology.com/projects/mariner-east-project-pennsylvania/

3. Concerning unloading terminals,

   a. VIP Rail is a company with two rail-centered terminals in Sarnia's industrial cluster that provide transloading and terminalling of crude oil, NGLs, and refined products. Further detail on the VIP Rail terminals is provided later in the report. In addition to the two VIP Rail terminals, there is also existing NGL rail infrastructure with significant underground storage in the greater Sarnia area.

   Large-scale storage is helpful for seasonal commodities like butane and propane. DCP Midstream in Marysville has 336 million gallons of storage, and Plains Midstream in St. Clair, MI has 84 million gallons of storage.[12] As highlighted in Figure 11, these facilities feature pipeline connectivity to and under the St. Clair River and connect to the Sarnia petrochemical and refining complex (including Enbridge's Sarnia terminal and the Plains fractionator).

Figure 11



Source: PHMS NPMS-St. Clair County, MI, PLG Analysis

The DCP Midstream and Plains Midstream rail facilities are illustrated in Figure 12 and Figure 13, respectively.

[12] Michigan DOT Office of Rail, *Propane by Rail in Michigan's Upper Peninsula*, page 19, 11/30/2021

Figure 12: DCP Midstream – Marysville

Figure 13: Plains Midstream – St. Clair

b. Toledo also has multiple options for unloading crude by rail. The PBF Toledo refinery has rail and truck unloading for crude oil, with 22.5 kbpd of crude unloading capacity at its Toledo Truck Terminal and 16 kbpd of unloading capacity for crude, LPGs, gasoline and distillates at their Toledo Rail Products Facility.[13] The PBF Toledo refinery also receives crude from three pipelines (Enbridge, Patoka, and Mid-Valley).[14]

Midwest Terminals is a transloading and terminalling provider with two facilities in the Toledo area. Their Norfolk Southern (NS)-served Ironville Terminal has 24,000' of track, a 100 railcar loop, transloading for crude oil, butane, and other products.[15] Midwest Terminals' Facility 1 has 23,000' of rail track and has CSX rail service that is also open to CN, NS, and Ann Arbor Railroad rail service.[16] [17] As illustrated in Figure 14, Facility 1 shares a border with the BP Refinery on its East property line and has significant track infrastructure. This could be a viable option to unload unit trains of crude oil and build a short pipeline to the BP refinery next door.

Figures 14, 15, and 16 provide satellite overviews of the Toledo area refineries and facilities noted.

[13] PBF Energy Inc., *2021 Form 10-K*, page 20
[14] PBF Energy Inc., *2021 Form 10-K*, page 15
[15] Midwest Terminals, https://www.midwestterminals.com/ironville/
[16] Midwest Terminals, https://www.midwestterminals.com/facility-1/
[17] Railinc, https://www.railinc.com/railservicefinder/public/home

Figure 14

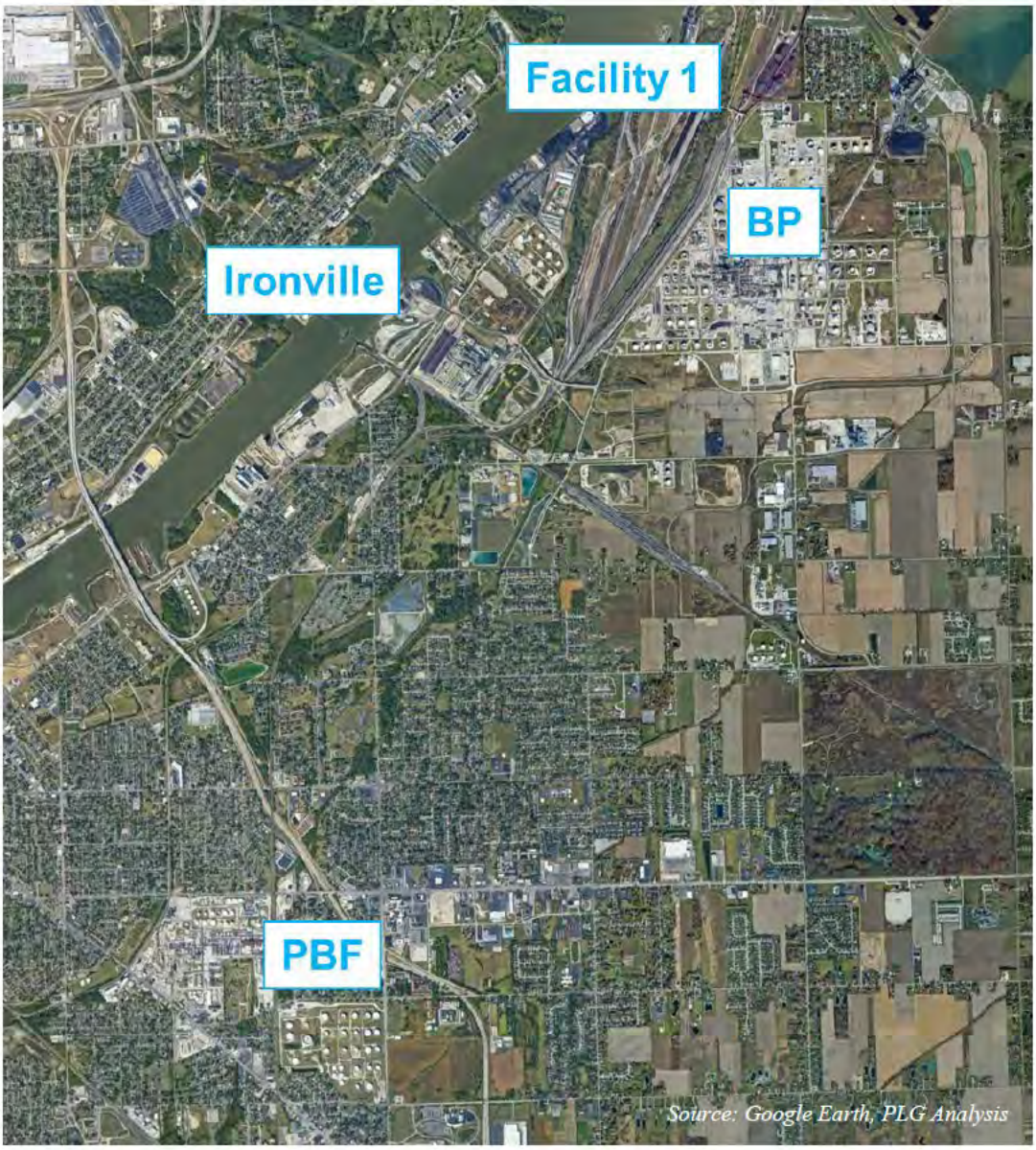

Facility 1
BP
Ironville
PBF
Source: Google Earth, PLG Analysis

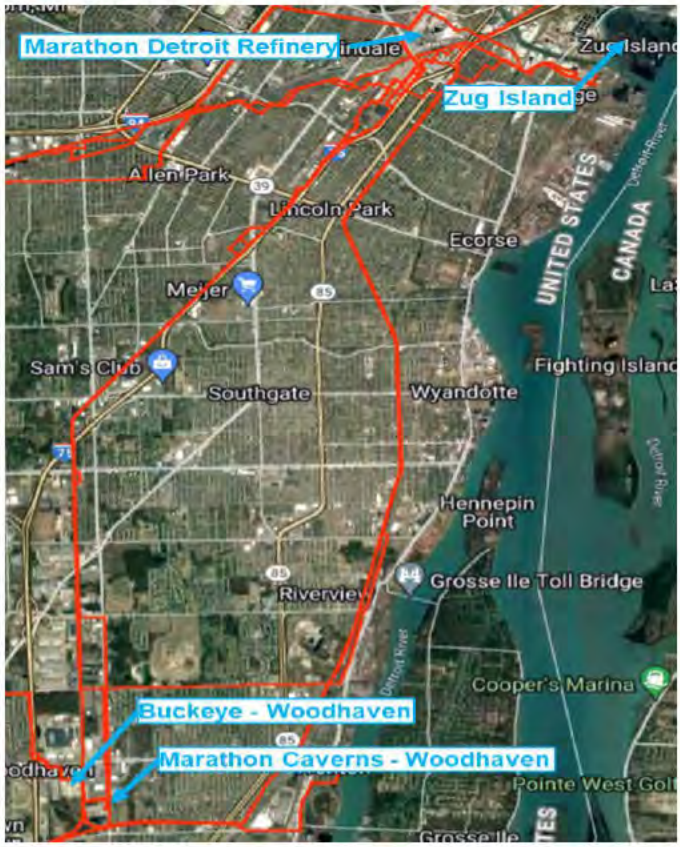
Figure 15: Facility 1

Figure 16: Ironville Terminal

c. The Marathon Detroit Refinery is connected via pipeline to Buckeye's Woodhaven terminal and Marathon's NGL cavern storage in Woodhaven, as illustrated in Figure 17. Butane could potentially be railed to the NGL storage caverns during the offseason, stored there, and then piped to the Marathon Detroit Refinery as needed during peak season. The rail infrastructure at Marathon's NGL cavern storage is illustrated in Figure 18 and appears to have at least 15 unloading spots (potentially 30 if unloading is done on tracks on both sides). Propane could also potentially be railed in during offseason to the NGL cavern storage and then distributed during peak season, as the facility has 73.71 million gallons of storage.[18]

[18] Michigan DOT Office of Rail, *Propane by Rail in Michigan's Upper Peninsula*, page 19, 11/30/2021

Figure 17



Source: PHMS NPMS-Wayne County, MI, PLG Analysis

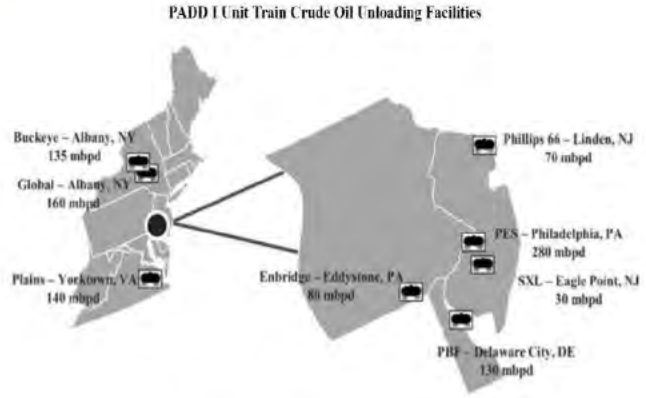
Figure 18

Source: Google Earth, PLG Analysis

ıl timeli ity to obtain required environmental permits, calling it "impossible." Any additional rail unloading capacity is likely to come from expanding an existing terminal or constructing it on a "brownfield" rather than "greenfield"[19] site. Sarnia, Ontario is a highly industrialized area and has many chemical plants and oil refineries. There have been many unit train crude oil unloading terminals built in eastern North America (Figure 19), and in much more populated areas with likely tougher permitting/environmental issues than could be anticipated in the Line 5 destination market area.

[19] "Brownfield" refers to property that has been historically used for industrial purposes, is already zoned accordingly, and therefore is often more easily and quickly be permitted for continued industrial uses. "Greenfield" refers to virgin land (can be wooded, open field, pasture, farmland, or similar) that has not historically been used for industrial purposes.

Figure 19



Source: EIA and Company Reports *From Philadelphia Energy Solutions Form S-1, 2/17/2015*

The crude by rail receiving terminal built in 2013 for the former Philadelphia Energy Solutions refinery is a good example of an offloading facility project that was successfully permitted and built despite proximity to neighborhoods, two interstate highways, and the Philadelphia sports complexes. The project took only 15 months from announcment to opening of the rail unloading facility.[20] [21] Enbridge itself took less than 16 months from announcement to completion of a rail and truck transload center supporting three unit trains per day in Berthold, ND.[22] [23]

5. Lastly, the phrase *"eight loaded and empty 100-plus car unit trains per day"* from the Rennicke report is confusing and prone to misinterpretation. The actual volume converted to a unit train count should be more precisely described as four loaded and four empty unit trains per day, not "eight loaded and empty."

From page 20 of the Rennicke Report:

"The most direct route for loaded trucks between Superior and Sarnia is through northern Wisconsin, UP Michigan, over the Mackinac Bridge, and south through Michigan to Sarnia, a journey of 707 miles. It is important to note that this route traverses the Bad River Reservation on US Highway 2, so that the crude oil and NGLs now moving in Line 5 would continue to move through the Reservation. This would create traffic congestion and an increased risk for traffic accidents on the Reservation that are not present when Line 5 is in operation. Once trucks are emptied at Sarnia, they would return to Superior via the same route, again traversing the Reservation."

PLG comments: Apart from the fact that this statement is a continuation of the Rennicke Report's straw man scenario of an all truck replacement for Line 5 product volumes, for whatever reason Google Maps was selectively used in the Rennicke Report instead of the industry standard tool PC*Miler as source for trucking route and miles from Superior, WI to Sarnia, ON. Google Maps is not how trucking companies select routes. PC*Miler is a technology tool used for trucking because

[20] Carlyle, *The Carlyle Group and Sunoco Agree to Form Philadelphia Refinery Joint Venture*, 7/2/2012
[21] Progressive Railroading, *CSX-served crude unloading facility opens at Philadelphia refinery*, 10/3/2013
[22] Progressive Railroading, *Enbridge Energy eyes unit-train loading facility in Bakken Shale*, 12/7/2011
[23] Area Development, *Enbridge Pipelines Completes Berthold, North Dakota Rail Terminal*, 8/9/2013

it selects "practical"[24] routes for trucks, taking into consideration distance, road quality, terrain, local and state regulations, congestion, transit time, and other factors. According to parent company Trimble, Inc., 98% of for-hire carriers use PC*Miler as the industry standard for determining routes and miles.[25]

The PC*Miler practical route from Superior, WI to Sarnia, ON goes South on Highway 53 to Interstate 94 and does not traverse the Bad River Reservation.[26] Note that the Rennicke report selectively uses PC*Miler for rail distance but did not use PC*Miler for truck routing.

From page 22 of the Rennicke Report:

> *"In addition, each transload facility would need storage to be constructed. At Superior, enough storage would need to be provided to handle at least a one-day outage of highway capacity (such as due to a severe winter storm). I estimate that the Superior transload facility would need storage tanks for 350,000 barrels of crude oil and two 50,000-barrel NGL spheres."*

PLG comments: This statement is problematic for several reasons:

1. First, it is an extension of the Rennicke Report's belabored straw man argument imagining if all of Line 5 volume were to be handled by truck in the event of a shutdown. As we have stated earlier, this is not a scenario that would be seriously considered and also misses the point that the replacement supply would not all need to come from the exact same origins as today.

2. Secondly, on the factual matter of how much storage exists at Superior today: Enbridge Superior Terminal has total shell storage capacity of 13,000,000 bbls.[27] Truck and rail loadout would likely be built next to the storage tanks so there would not be a need for significantly more storage. The Plains fractionator next to the Enbridge Superior Terminal appears to already have truck loadout capability.

From page 26 and 27 of the Rennicke Report:

> *"In practice, barge transportation of the product now moving in Line 5 would not be feasible because the fleet of specialized barges that would be required does not exist."*
>
> *"The specialized vessels and double-hulled tankers that would be needed do not exist."*

PLG comments: It appears that the Rennicke Report fundamentally misunderstands bulk commodities transportation by water on the Great Lakes. Moving these products on the Great Lakes would not and could not be moved in "barges." Rather, the equipment used would have to be tanker vessels/parcel tankers. In addition to the equipment terminology confusion, the Rennicke Report also definitively states that the equipment required "do[es] not exist," which is incorrect.

[24] Generally speaking, trucks are not routed via the shortest or "as the crow flies" routes. This is because vehicle size, bridge clearances, transit time, truck route regulations, roadway capacity and safety, and other factors necessitate more appropriate routes for large trucks. Such routes are termed "practical" routes or miles.
[25] PC*Miler, https://www.pcmiler.com/about/
[26] PC*Miler 35.17.0, accessed March 22, 2022
[27] Enbridge, https://www.enbridge.com/~/media/Enb/Documents/Projects/Wisconsin/ENB_SuperiorTerminalHandout.pdf?la=en

Suitable vessel size for the trade would be an intermediate size oil tanker of approximately 19 – 20,000 deadweight tons capacity, with a maximum beam of 23.3 meters (or about 75 feet) capable of transiting the Saint Lawrence Seaway to enter the Great Lakes. There are plenty of these vessels in several regions around the world including the Baltic Sea, West Africa and Asia / Far East that would be available for this trade. An example would be the Harbour Pioneer, a 2010-built 19,122DWT oil/chemical tanker, as an example of a representative ship that could perform this movement.[28]

Vessels for this trade would need to be certified Ice Class 1A by a major classification society (e.g. American Bureau of Shipping, Lloyds Register, Det Norske Veritas), which means that the vessel is built with a minimal level of ice strengthening for summer operation in arctic waters or winter navigation in sub-arctic waters. Canadian flag or U.S. flag ("Jones Act") ships are not required because this movement is between United States and Canada. Instead, a foreign-flagged ship may be chartered from the international market at prevailing market rates. If a vessel charter was fixed today, the vessel could be delivered into the Great Lakes in about 20 days. Depending on length of time commitment, a Contract of Affreightment ("COA") could be structured whereby one or more dedicated ships operate in a rotation for the trade. For a longer-term time commitment, ordering custom-built newbuildings that would be dedicated to the trade could be explored.

From page 30 of the Rennicke Report:

> *"In December 2019, the last month before the outbreak of COVID-19 in the United States, the North American rail industry transported an average of 314.7 kbd (thousand barrels per day) of crude oil from the Midwest. A Line 5 shutdown would add 226.7 kbd of crude oil, suddenly increasing rail transport demand for crude oil by 72 percent, to 541.4 kbd. This sudden influx of volume would create a range of problems that are unlikely to be resolved during the uncertain period during which Line 5 would be shut down."*

PLG comments: The Rennicke Report disingenuously uses only Midwest (PADD 2) originations of crude oil as the baseline (denominator) for crude oil rail transport demand. The North American crude by rail (CBR) activity is an integrated market of carriers, railcar providers, terminal operations, traders, marketers, and origins and destinations. There is no reason to evaluate additional crude by rail volumes created by a potential Line 5 shutdown within the context of just PADD 2 originations, unless the goal is to create a distorted picture and a dramatic-sounding headline ("…suddenly increasing…by 72 percent…") signaling vague but ominous outcomes ("…create a range of problems…").

Total crude by rail volume involving the U.S. for December 2019 was 726.94 kbpd[29] which is more than double the baseline number used by the Rennicke Report of 314.7 kbpd. Thus the actual percentage increase (assuming that all 226.7 kbpd Line 5 volume did end up moving via rail, which may not be the case as we explain later) as compared to that time period is 31%. However, even the December 2019 baseline is not as informative or important as the historical peak periods of North American crude by rail, in which as many as 1,137 kbpd were handled[30]. Thus, within the context of what the overall North American crude by rail system has handled in the past, the Rennicke Report's hypothetical scenario for peak additional crude by rail volumes created by a potential Line 5 shutdown would represent only about 20% of the historical peak.

[28] https://www.vesselfinder.com/vessels/HARBOUR-PIONEER-IMO-9572757-MMSI-255804340
[29] https://www.eia.gov/dnav/pet/PET_MOVE_RAILNA_A_EPC0_RAIL_MBBL_M htm
[30] U.S. Energy Information Administration, *Movements of Crude Oil by Rail*, release date 2/28/2022

From page 32 of the Rennicke Report:

> *"To put this into perspective, Trinity and Greenbrier, the two major manufacturers of the tank cars that would be required to transport Line 5 volume, reported 13,806 cars in the crude oil fleet at the end of September 2021. Diverting 226.7 kbd of Line 5 crude oil would require as many as 4,423 cars, which is over 32 percent of the total fleet of cars that can transport crude by rail."*

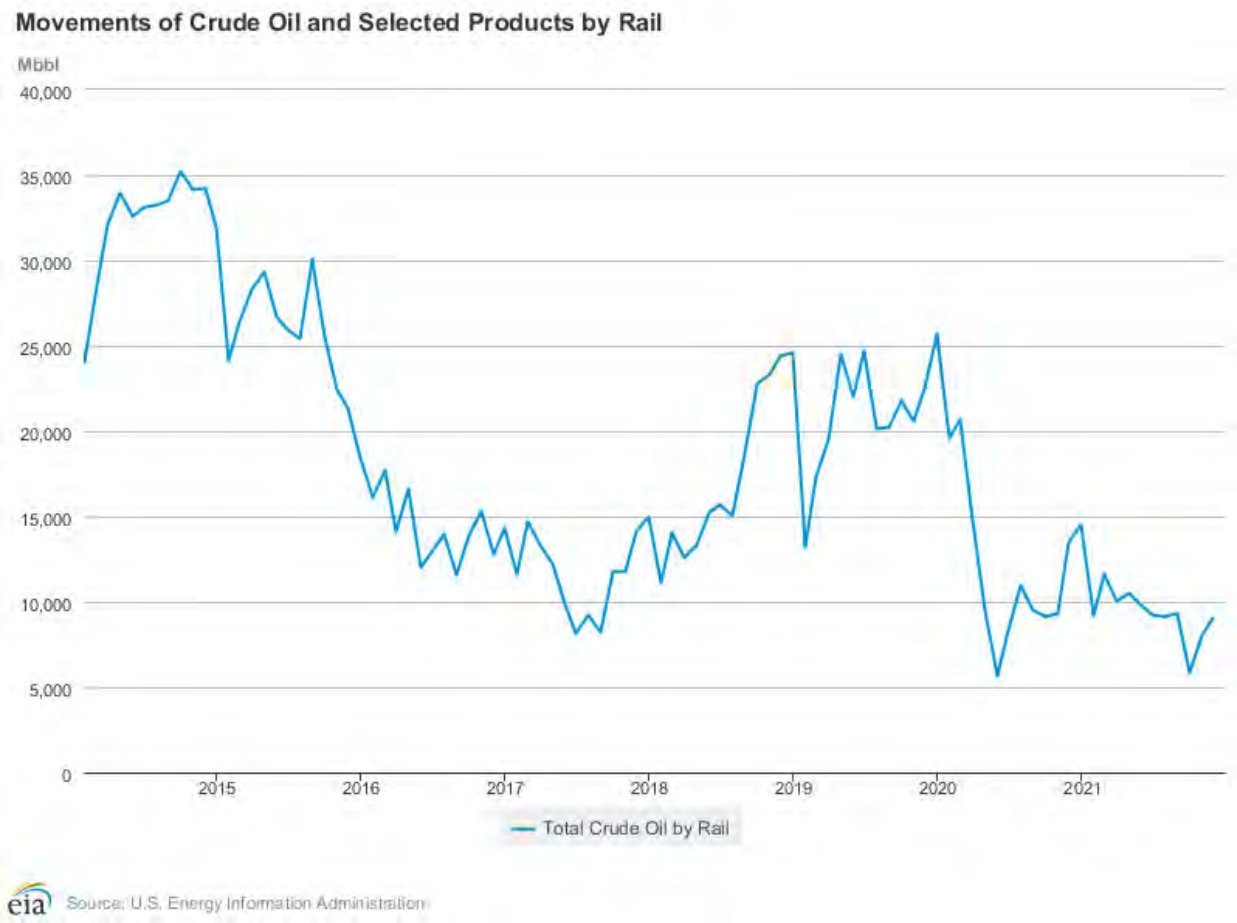
PLG comments: Most of the Rennicke Report content on the topic of crude and NGL tank cars either misunderstands or misrepresents the total fleet size, operational requirements, proportionality of Line 5 equivalent volumes versus total volumes, availability of equipment, mechanical and regulatory specifications, the leasing and deployment of this kind of equipment, and other factors that would be considered in evaluating rail as a logistics alternative to Line 5 product deliveries. Specifically,

1. Most fundamentally, the above Rennicke Report statement confuses the number of cars that are crude *eligible* with the number of cars currently *in* crude service. The result is an erroneous statement that the crude oil fleet is limited to just the 13,806 cars that were actually in that service as of September 2021. As we explain below, the 13,806 cars referenced merely reflects a static demand snapshot as of September 2021. There are actually over 120,000 cars suitable for the service.

2. Comparing the number of railcars that are currently in the crude oil fleet versus how many would be required to move Line 5 crude oil is not relevant. The decrease in crude by rail from its historical peak has actually increased the availability of railcars that could be used to transport Line 5 volume. As illustrated in Figure 20, crude by rail (including intra-U.S. movements, U.S. exports to Canada, and U.S. imports from Canada) has seen a large decrease since its peak, when over 35,000,000 bbls were transported by rail in October 2014 as compared to just 5,860,000 bbls in October 2021, a decrease of 83%.[31]

[31] U.S. Energy Information Administration, *Movements of Crude Oil by Rail*, release date 2/28/2022

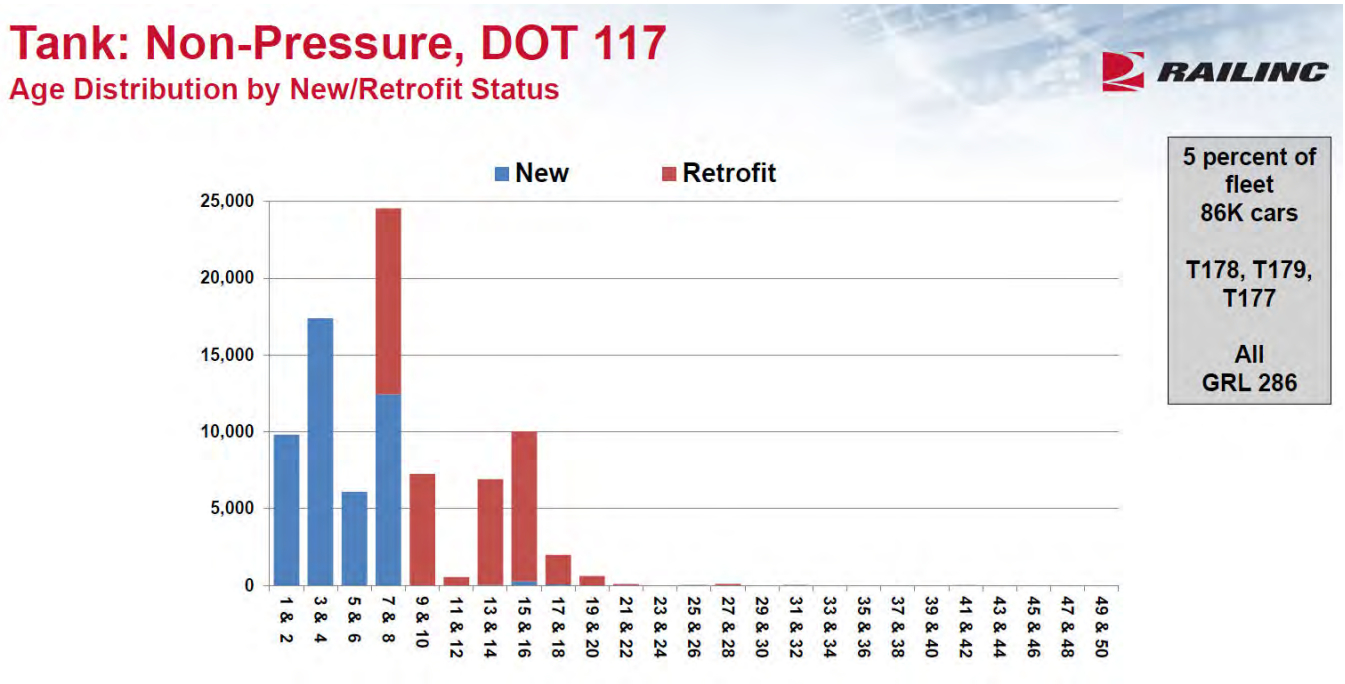
Figure 20



3. Currently, crude by rail is approved (based on mechanical and regulatory specifications) in DOT117J (new), DOT117R (retrofitted), and jacketed CPC-1232s tank cars. Jacketed CPC-1232 tank cars have a phase-out date for crude of May 1, 2025.[32] At the end of 2021, there were ~86,000 DOT 117s in the North American tank car fleet, as illustrated in Figure 21.[33] These railcars are all capable of moving crude oil along with ethanol and other flammable liquids. This is over six times larger than the implied 13,806 cars that the Rennicke Report states can transport crude by rail.

[32] U.S. Bureau of Transportation Statistics, *Fleet Composition of Rail Tank Cars Carrying Flammable Liquids: 2021 Report*, release date 9/23/2021
[33] Railinc, *North American Railcar Review*, published 3/7/2022 with 12/31/2021 data

Figure 21



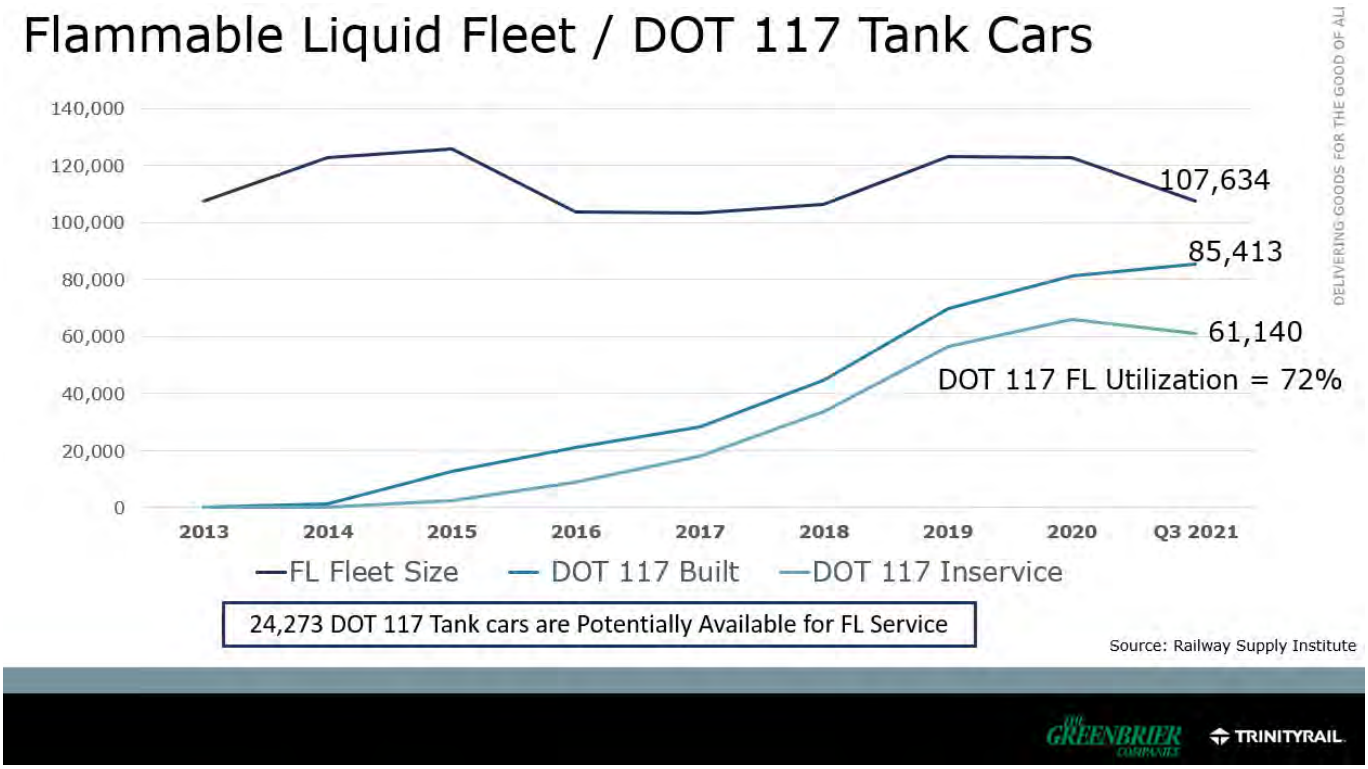
Source: Railinc, North American Railcar Review, published 3/7/2022 with 12/31/2021 data

4. Within the total crude-eligible fleet defined above, data indicates a current underutilization of that equipment. Meaning, not only is the total crude eligible fleet size more than six times larger than claimed in the Rennicke Report, a significant portion of that fleet is likely available if needed to handle current Line 5 volumes. In Q3 2021 (latest data available) there were 24,273 DOT 117 tank cars potentially available for flammable liquid service that were not being used in such service (Figure 22). This is approximately 5.5 times larger than the 4,423 tank cars the Rennicke Report calculates would be needed to divert the entire shortfall of 226.7 kbpd of Line 5 crude oil projected by that report. The "other flammable liquids[34]" fleet was 58,133 in 2021 through Q3, which is larger than the crude oil and ethanol fleets combined.[35] Other flammable liquids packing group II/III (super majority of "other flammable liquids" fleet) have a phase-out date of May 1, 2029 for DOT 111s and CPC-1232s. With a phase-out date of over seven years away, this fleet as a whole has been slower to transition to DOT 117s and therefore reflects a gradual rather than abrupt transition demand for these products for the DOT117 cars either extant or in builder order books. The data in Figure 22 is also supported by several interviews of tank car brokers, which revealed significant inventories of CBR and pressure tank cars in storage.

[34] "other flammable liquids" refers to all flammable liquids (Class 3) that are not ethanol or crude oil

[35] Trinity Rail Group/The Greenbrier Companies, "*STB RETAC Railcar Update – November 2021*," presentation to the Rail Energy Transportation Advisory Committee, [Surface Transportation Board website] https://www.stb.gov/wp-content/uploads/RETAC-Railcars-April-22-2021.pptx, slide 16

Figure 22 *Source: Railinc, North American Railcar Review, published 3/7/2022 with 12/31/2021 data*



In summary, tank car availability would not be a barrier to the provision of rail transportation as a logistics alternative for Line 5 products and markets.

From page 34 of the Rennicke Report:

> *"Tank cars are designed and built with different sizes to haul different quantities based on shippers' operations and the weight and other characteristics of the commodities being hauled."*
>
> *"Thus, it is possible that larger volume cars could be overfilled and exceed the weight limit of the track and bridges crossed by trains"*

PLG comments: In our view, these statements and the entire discussion within the Rennicke Report regarding different railcar sizes is a red herring[36]. Many crude by rail unit train facilities have operated with different sized railcars without

[36] Used as an idiom and logical fallacy, a "red herring" is something that misleads or distracts from a relevant or important question.[1] It may be either a logical fallacy or a literary device that leads readers or audiences toward a false conclusion. A red herring may be used intentionally, as in mystery fiction or as part of rhetorical strategies(e.g., in politics), or may be used in argumentation inadvertently. The term was popularized in 1807 by English polemicist William Cobbett, who told a story of having

issues. There are procedures and equipment to protect against car misloading, including flow meters and in-track scales. The ability of these systems to reliably load liquids into tank cars of varying sizes can be as accurate as plus or minus three gallons consistently over a period of years.

Given that there are crude oil unit train sets in storage that are homogenous, such trainsets would likely be the first railcars procured for the "standing up" of any new CBR supply chain. Also, once the railcars have been procured they could be sorted by railcar type to make mostly homogenous unit train sets. But, even if there is car size variability within a unit trainset, loading systems are sophisticated enough to account for this variability and ultimately this is not an argument that alternative logistics solutions involving rail are either unavailable or unviable for Line 5 products and markets.

From page 37 of the Rennicke Report:

> *"Overall, I estimate a fleet of 1,103 high-pressure tank cars on a 10-day cycle time or 1,324 high pressure tank cars on a 12-day cycle time would be required to move the approximately 83.9 kbd of NGLs from Edmonton to Sarnia over the most direct rail route (Exhibit III-2). This would require diversion of at least 7 to 9 percent of the existing fleet of T389 cars—which already are in short supply during peak periods of the year—to transport NGLs now carried by Line 5. As with the crude oil fleet, shippers will prefer a homogeneous fleet of high-pressure cars for operational and safety reasons, making it even more challenging to quickly acquire 1,103 to 1,324 such cars."*

PLG comments: The Rennicke Report questions the ability to secure this number of cars from the active fleet. That assumption ignores the supply of cars held in long-term storage. The supply of large-volume (27,500+ gal.) pressure tank cars in long-term storage exceeds 2,100 cars for those that have not moved in a year and 850+ cars for those that have not moved in two-years or more. An additional 531 cars have been stored for an unknown time frame or unknown reasons.[37]

Some of these stored cars previously carried NGLs produced from the Marcellus/Utica shale region prior to the construction of additional pipeline takeaway capacity. Energy Transfer Partners completed the 275 kbpd Mariner East 2 NGL pipeline, which flows from the Marcellus/Utica to an East Coast export terminal, in 2018. As many as 5,000 cars were idled as a result of this pipeline coming online[38], along with many of the rail loading facilities at Marcellus/Utica fractionation plants.

Another concern raised by the Rennicke Report is the ability to find a large quantity of appropriately sized tank cars. The tank car fleet used to ship propane and butane is uniform and custom-built to handle pressure loads. This fleet is not interchangeable with cars used in crude oil or refined product service. The standard pressure tank car sizes are 30,000 gallons or 33,000 gallons. In short, there would not be a problem in securing the proper number, size and specification of railcars needed to handle additional NGL rail volumes that may be created by a shutdown of Line 5.

From page 39 of the Rennicke Report:

used a strong-smelling smoked fish to divert and distract hounds from chasing a rabbit. (from Wikipedia: https://en.wikipedia.org/wiki/Red_herring#cite_note-3)

[37] AAR Stored Railcar data, March 1, 2022
[38] Energy Transport Insider, *SPECIAL REPORT: QUANTIFYING THE MARINER EAST 2 EFFECT ON TANK CAR SUBLEASE PRICES*, 2018

"Sarnia is a pipeline-served market and no crude oil or NGL rail unloading terminals have ever been built there to serve local refineries. Accordingly, currently there is no way to unload the volume of displaced crude oil or NGLs from rail. Most of the other refineries served by Line 5 volume and that would experience shortfalls as a result of a Line 5 shutdown also lack any or adequate rail unloading facilities."

PLG comments: First, regarding Sarnia: Not only are there rail terminals capable of crude and NGL unloading in the Sarnia, Ontario area, two of them share a property line with refineries.

According to the website of rail terminalling and logistics company VIP Rail, *"VIP Rail has capability to provide bulk liquids tank storage, product blending, and product transfer to and from rail and truck. We are also currently investing in dock infrastructure to be able to provide water access. With the ability to handle a variety of liquids, including crude oil, natural gas liquids, and refined products, VIP Rail is a strategic partner for companies transporting, and storing bulk liquids in the greater Sarnia region.*

VIP Rail has unique infrastructure onsite. We are also well capitalized, and eager to invest in the right projects to meet customers' needs, and to further grow our terminalling business.

Onsite capacity for over 1,350 railcars

Daily security checks, and complete perimeter fencing

Railcar storage of hazardous materials, and dangerous goods."[39]

It is clear that VIP Rail has capabilities to unload crude oil and NGLs to the Sarnia refineries. And, the VIP Sarnia facility (along with its significant amount of rail track) and Imperial Oil share a property line, which makes it likely that a short pipeline could be built relatively easily to connect the two facilities as illustrated in Figure 23.

Figure 23

Source: Google.com via https://www.viprail.com/locations/

[39] https://www.viprail.com

Meanwhile, the VIP Corunna facility and the Shell refinery share a property line, also making it likely that a short pipeline could be built relatively easily to connect the two facilities (Figure 24). VIP Corunna has 160 acres of heavy industrial zoned land on the east side of its property that it is advertising to develop.[40] This land could likely be used to add additional track to handle more railcars, tankage, and offloading infrastructure.

Figure 24

Source: Google.com via https://www.viprail.com/locations/

The third refinery in the Sania-area is the Suncor Sarnia Refinery. Unlike Shell and Imperial, this refinery does not presently have a rail terminal sharing a property border. However, there appears to be underutilized brownfield property northeast of the Suncor Refinery with existing rail infrastructure (Figure 25 and Figure 26). There may be potential for this rail-accessed brownfield property to be developed to receive crude and NGLs by rail and then pipe those products to the Suncor Refinery. Also, the Suncor Refinery has marine access (Figure 25), which potentially could be utilized to bring in crude by water. VIP Rail is currently investing in dock infrastructure to be able to provide water access.[41] The Suncor Refinery could potentially receive crude that moves by rail to a VIP Rail location and is loaded onto the water for a short movement on the St. Clair River to the Suncor Refinery.

[40] https://www.viprail.com/services/land-available/
[41] https://www.viprail.com/services/terminalling/

Figure 25: Suncor Refinery and Nearby Property

Source: Google Earth, PLG Analysis

Figure 26: "Zoom In" on Nearby Property with Rail Infrastructure

Source: Google Earth, PLG Analysis

From page 40 of the Rennicke Report:

> *"Crude-by-rail terminals that have failed to win necessary permissions in recent years include Vancouver Energy's unloading terminal for four trains per day in Vancouver, WA (four-year review process), Valero Energy's 70 kbd unloading terminal in Benicia, CA (three-year review process); and Phillips 66's three trains-per week unloading terminal in San Luis Obispo, CA (also a three-year review process)."*

PLG comments: The Rennicke Report disingenuously cites only projects in states known for having extremely difficult permitting and environmental review processes for industrial projects. California and Washington have different regulatory environments than places like Sarnia. As already stated, Sarnia is a very industrial area and multiple crude by rail unloading terminals have successfully been built on the East Coast, a more "apples to apples" region for comparison.

From page 42 of the Rennicke Report:

> *"The Northern route bypasses Wisconsin but passes through Oba and Toronto before backtracking west to Sarnia. This route is over twice as long as the Southern rail route (1,815 miles vs. 822 miles), thus trip times would be longer and moving Line 5 product would require a larger number of railcars to move the same amount of product, potentially increasing the amount of the NGLs and crude oil shortfall that could not be moved by rail."*

PLG comments: This statement contains factual errors and miscalculation of rail miles. The route discussed is from Winnipeg to Sarnia. The rail miles from Winnipeg to Sarnia on the "Southern" route is 1,210 miles, not 822 miles as stated

by the Rennicke Report.[42] Therefore, the Northern route is 50% longer in rail miles than the Southern Route, not twice as long as per the Rennicke Report.

Starting on page 47 of the Rennicke Report is a section labeled:

"4. Potential for Increased Rail Route Congestion"

PLG comments: This section of the Rennicke Report contains a broad mis-analysis that may be be summarized in two categories:

1) Reliance upon and misinterpretation of an outdated third party study in which CN did not participate, and

2) Incorrectly assuming that all new potential rail volume created by a potential Line 5 shutdown would still have to come from western Canada, and if so would all traverse just a single rail route (CN's central Wisconsin route discussed extensively by the Rennicke Report) between Winnipeg and Sarnia/Toledo/Detroit when in fact there are multiple route options over which to spread the volume.

This entire section should be rejected because of this mis-analysis for reasons detailed below:

1) Reliance upon/misinterpretation of the outdated 2007 AAR study by Cambridge Analytics in which CN did not participate

Mr. Rennicke's analysis relies upon a September, 2007 report entitled "National Rail Freight Infrastructure Capacity and Investment Study," [43] which was commissioned by the Association of American Railroads (AAR) and completed by Cambridge Systematics, Inc. AAR undertook this effort at the request of the National Surface Transportation Policy and Revenue Study Commission, which had been charged by Congress to "develop a plan of improvements to the nation's surface transportation systems that will meet the needs of the United States for the 21st century."[44]

In its 2007 work, Cambridge Systematics clearly stated that "the forecasts and improvement estimates in this study do not fully anticipate future changes in markets, technology, regulation, and the business plans of shippers and carriers. Each could significantly reshape freight transportation demand, freight flow patterns, and railroad productivity, and, thus, rail freight infrastructure investment needs". [45] The rail industry has experienced significant changes in the fifteen years since the Cambridge Systematics study was published that would certainly alter the results, including but not limited to Precision Scheduled Railroading (PSR); advanced computer-aided dispatching (CAD); locomotive horsepower ratings and corresponding increased train lengths; locomotive and railcar telecom capabilities; and market shifts in commodities and applicable train service. The study also conceded that, unlike the highway system, "The railroads are publicly traded or privately-owned companies… [N]either the U.S. DOT nor individual state DOTs have comprehensive rail infrastructure databases suitable for long-term planning".[46] Railroads did not provide this information during the course of the study, some limiting their participation to confirming/denying high-level corridor views of approximate information regarding both

[42] PC*MILER® RailVersion 27.0. PC*MILER Rail is the industry-leading point-to-point rail routing and mileage software.
[43] Cambridge Systematics, Inc, National Rail Freight Infrastructure Capacity and Investment Study, September 2007
[44] Cambridge Systematics, Inc, *National Rail Freight Infrastructure Capacity and Investment Study*, September 2007, page ES-1
[45] Cambridge Systematics, Inc, *National Rail Freight Infrastructure Capacity and Investment Study*, September 2007, page 1-1
[46] Cambridge Systematics, Inc, *National Rail Freight Infrastructure Capacity and Investment Study*, September 2007, page 2-6

volume and infrastructure (BNSF, CSXT, NS, Union Pacific (UP)).[47] Other railroads (CN, Canadian Pacific Railway (CP), Kansas City Southern (KCS)) did not participate. [48]

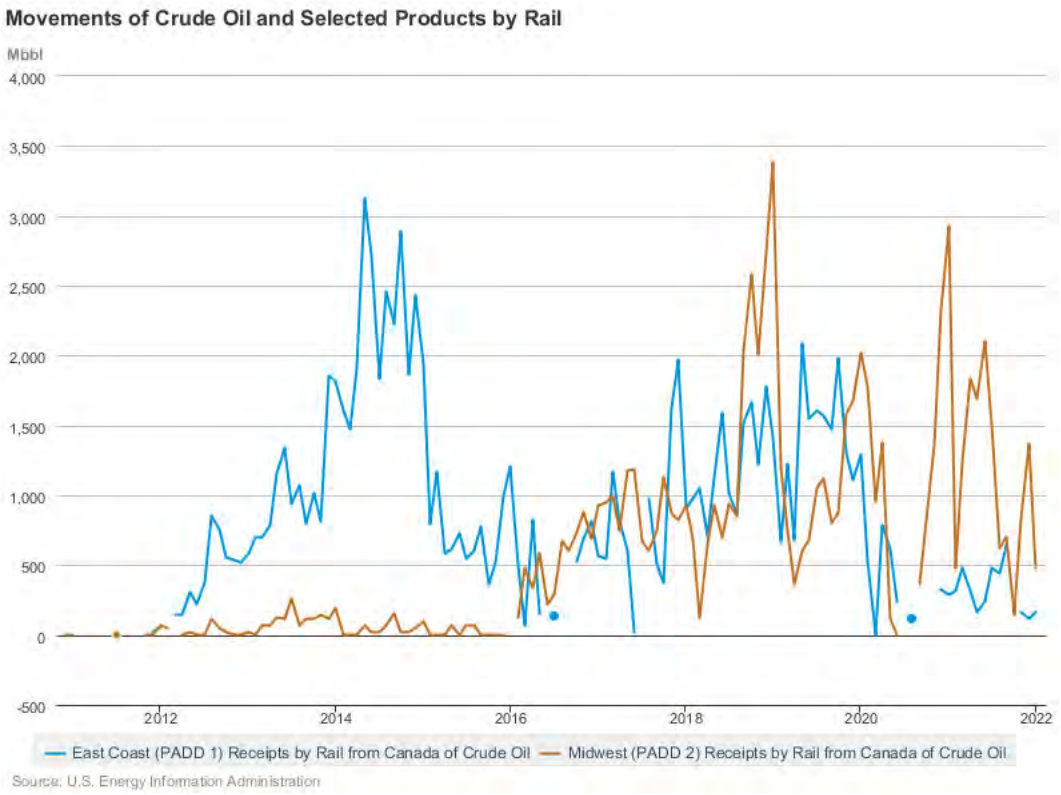
The study's assignment of "Average Capacities of Typical Rail-Freight Corridors"[49] is highly inaccurate, as it assumes that rail capacity is simply a matter of track authority systems (referred to as "Type of Control") and the number of mainline tracks. This is a highly simplistic approach, reminiscent of using pre-1975 "stringline" assessment [50] that disregards the multiple factors of capacity that are considered in a quality line capacity evaluation. These factors include, but are not limited to, overall segment length; track configuration (number, positioning and lengths of mainline tracks and siding; locations of crossovers in mainline tracks and sidings); number and location of curves and bridges; ruling grade; train type mix (including AMTRAK and other passenger operations that are strictly scheduled); allowable speeds by train type; and inter-arrival times between meet/pass locations. As an example, a single-mainline CTC segment with five sidings will have a significantly different capacity than an equal-length segment with 10 sidings. A equal-sized and controlled segment operating in flat terrain will have a very different capacity rating that one traversing mountainous territory. A segment's capacity will differ greatly on days when AMTRAK and/or passenger service is present vs. those days it is not.

Class I[51] railroads began developing in-house line capacity assessment models in the mid-to-late 1970s, which are capable of segment-specific analysis based on actual infrastructure and traffic data. The most accurate line capacity evaluations are performed on segments whose end points are rail terminals with no intermittent terminals in-between, so railroad analysis supporting capacity improvements are done in this fashion.

CN has made large investments in the Wisconsin rail line of interest over the last 15 years, including installing sidings/passing tracks every 15 miles that are long enough to handle unit trains. Additional sidings/passing tracks are very helpful in reducing congestion on a rail line. Meanwhile, CBR demand is often driven by conditions wherein pipeline takaway capacity is exhausted. Enbridge's Mainline crude system accepted all pipeline nominations for March 2022 for the first time since June 2020, indicating that Western Canadian crude is no longer being stranded in Alberta (because pipelines are able to take all of the volume). Accordingly, crude by rail movements have fallen since Enbridge effectively added 370 kbpd of new export capacity with its Line 3 Replacement Project that went into service in October 2021.[52] The CN would have participated in a meaningful share of the crude by rail to PADD 2 refineries prior to the activation of this new pipeline takeaway capacity. Canada crude by rail volumes to PADD 1 and PADD 2 are shown below in Figure 27, highlighting that current volumes are significantly lower than previous highs. It is therefore reasonable to assume that CN should not have an issue accommodating increased crude by rail volumes given that the new potential volume that might be generated by a possible Line 5 shutdown would be lower than historical highs.

[47] Cambridge Systematics, Inc, *National Rail Freight Infrastructure Capacity and Investment Study*, September 2007, page 2-6
[48] Cambridge Systematics, Inc, *National Rail Freight Infrastructure Capacity and Investment Study*, September 2007, page 56
[49] Cambridge Systematics, Inc, *National Rail Freight Infrastructure Capacity and Investment Study*, September 2007, page 6-1, Table 6-1
[50] : Stringline assessment involved the use of a track chart positioned on a wall, thumbtacks and string to create a meet/pass plan for trains on a given line segment in a day's time)
[51] "Class I" refers to the US Surface Transportation Board's classification of railroads based on annual revenue. The seven largest North American railroads, having revenues in excess of $250MM annually, are designated as Class I. They are Burlington Northern Santa Fe (BNSF), CSX, Canadian National (CN), Canadian Pacific (CP), Kansas City Southern (KCS), Norfolk Southern (NS), and Union Pacific (UP).
[52] https://www.argusmedia.com/en/news/2302335-enbridge-accepts-all-pipeline-nominations-in-march

Figure 27



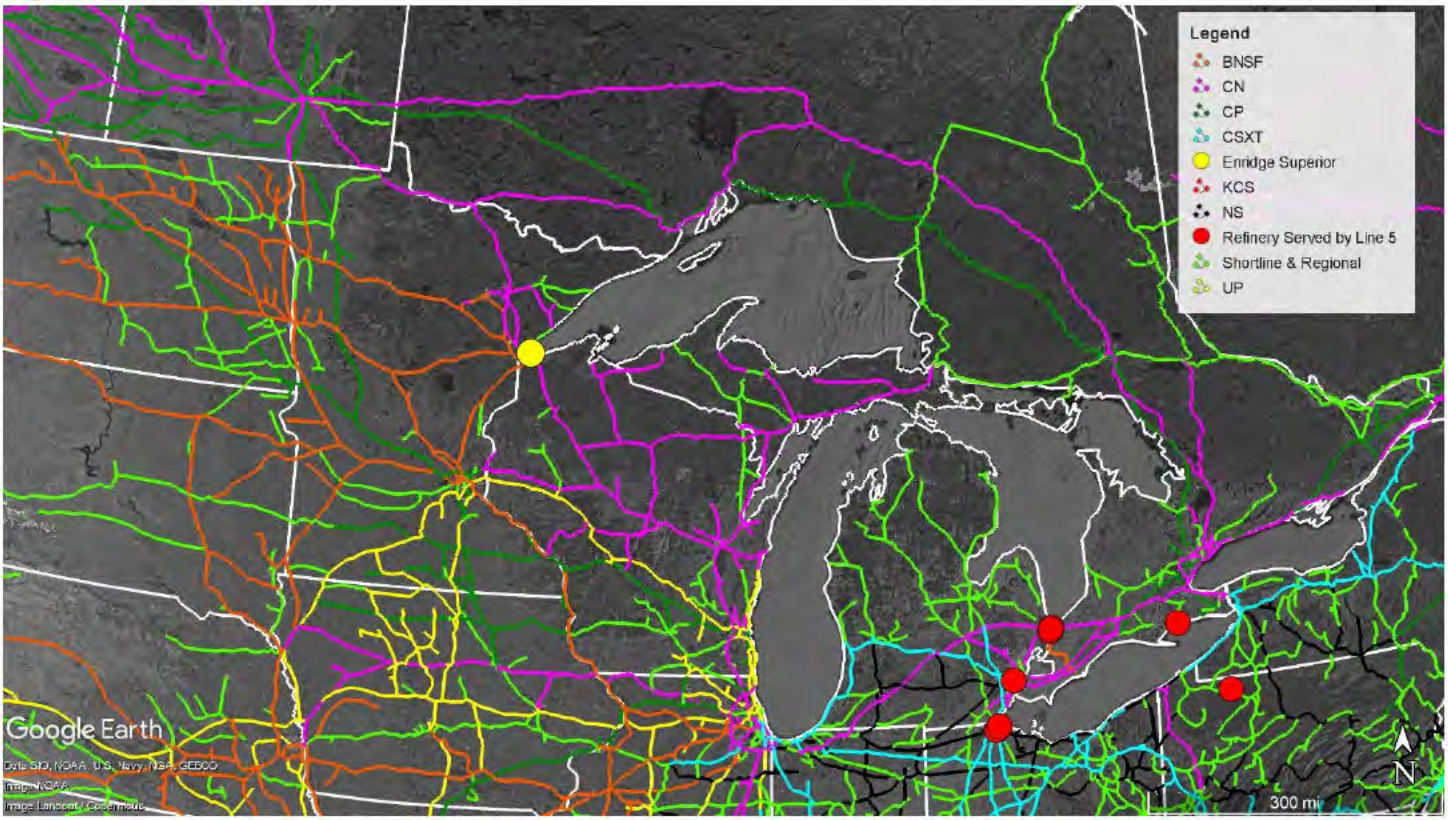
2) Incorrectly assuming just one of many rail routes between Superior, WI to Line 5 destination crude markets would handle any potential CBR volumes diverted from Line 5

The Rennicke Report incorrectly assumes and implies that all potential CBR replacement volume of Line 5 crude shipments would traverse only the CN's central Wisconsin line. By exhaustively discussing just one particular rail line owned by Canadian National between Superior, WI and Sarnia, ON, the Rennicke Report creates a misleading impression that all new potential rail volume created by a possible Line 5 shutdown would be concentrated into just one already busy corridor. The report further misleads by implying that because CN's central Wisconsin line is the "shortest distance" route it somehow means that this particular CN line should or would handle all such hypothetical new volume. In reality, rail traffic routings are influenced by a range of commercial and operational factors and are rarely determined strictly by shortest route miles.

In fact, there are multiple rail route choices from Superior, WI to Sarnia, ON in addition to the CN-direct route through Wisconsin belabored by the Rennicke Report. Those alternatives include three other trans-Wisconsin routes, two northern Ontario routes, and at least one Minnesota-Iowa-Illinois route. Besides CN, Superior, WI is served by BNSF and CP which both go to Chicago, IL where they interchange with, among others, the CSX and CN railroads that serve Sarnia, ON. It is very common for energy by rail movements to involve multiple Class I railroads.

Figure 28 below shows the North American rail network routes that span the Great Lakes region.

Figure 28



Source: Google Earth, STB, EIA, PLG Analysis

From page 47 of the Rennicke Report:

> *"Congestion on a rail line is measured using a calculation known as "level of service" ("LOS")' developed by the Association of American Railroads."*

PLG comments: This statement is inaccurate, as follows:

- Level of Service (LOS) is an indicator developed in 1965 by the Transportation Research Board as a highway measurement, and is still regularly published in updates to the Board's Highway Capacity Manual
- It appears to have been "borrowed" for the 2007 study by Cambridge Systematics and applied to freight rail operations
- It is not a freight rail industry-accepted measure
- Considering the methodology used by Cambridge Systematics to calculate trains per day (high-level, based only on track authority systems and numbers of main line tracks),[53] applying a measure of this mathematical granularity is analytically inappropriate for railroads since the LOS method was originally developed for highways as a qualitative measure of highway capacity segments having uniform conditions.

Starting on page 52 of the Rennicke Report is a section labeled

> *"5. Impacts on Wisconsin Economy and Industries Dependent on Rail Service"*

[53] Cambridge Systematics, Inc, *National Rail Freight Infrastructure Capacity and Investment Study*, September 2007, page 6-1

PLG comments: This entire section of the Rennicke Report is based on *4. Potential for Increased Rail Route Congestion* being accepted, which for reasons described above should be rejected. Therefore, this section should also be rejected. Also, as per earlier in the report, there are many different routes to Sarnia from Edmonton and Superior which do not need to involve CN's central Wisconsin line. Finally, on page 53 the Rennicke Report extrapolates to a slippery slope extreme by implying that if Line 5 volumes converted to rail that traffic must travel CN's central Wisconsin line (again, a false assumption) and the traffic will then over-stress that line to an extent that "if the state's transportation system were to falter for any reason, 39.6 percent of the state's economy could be put at risk." This is a sweeping hyperbole[54] to suggest that the re-routing of partial volumes from Line 5 onto rail, amounting to four new trains in each directions, some or all of which might never transit Wisconsin, would somehow threaten the entirety of the "state's transportation system" and put 40% of the state's economy "at risk."

From pages 60 and 61 of the Rennicke Report:

> *"Congestion in the Chicago terminal area can 'back up' rail operations and negatively impact rail service in southeastern Wisconsin."*
>
> *"Indeed, the addition of Line 5 product volumes to an already congested rail interchange may exacerbate congestion and impact rail transport for Line 5 products as well as other products that are transported by rail through Wisconsin."*

PLG comments: These statements are not supported by any facts, and reflect nothing more than broad generalizations concerning the Chicago Terminal that, for carload traffic, refer to historical rather than present day conditions.

The Chicago Integrated Rail Operations Center (CIROC) was established in December, 2015 to monitor and facilitate Chicago Rail Terminal operations. It is authorized via the Chicago Terminal Operating Condition Agreement between the Association of American Railroads, AMTRAK, BNSF, Belt Railway of Chicago (BRC), Canadian National (CN), CSXT, Indiana Harbor Belt (IHB), METRA, Norfolk Southern (NS) and Union Pacific (UP). CIROC operates as a 24/7 control center whose number one goal is to address congestion and reduce delays. CIROC has direct connections to each carrier's operations management systems via COP (Common Operations Picture), and tracks all rail movement activities to identify issues and facilitate resolutions. CIROC reports weekly details to the United States Surface Transportation Board (STB) regarding Chicago Rail Terminal delays, issues, yard dwell and individual railroad performance, which are published on the STB's website[55] in this format:

[54] Hyperbolic fallacy (also known as "'*inductive hyperbole*") occurs when something is stated much more strongly than the observations behind it support (https://rationalwiki.org/wiki/Hyperbole)

[55] https://www.stb.gov

EP 724 - US RAIL SERVICE ISSUES - DATA COLLECTION

Chicago Railroad	Year: 2022	Reporting week	Date Week Began:	03/13/22
			Date Week Ended:	03/19/22

Chicago Gateway	
Barr	*1,455*
Bensenville	*1,229*
Blue Island	*1,723*
Calumet	*896*
Cicero	*826*
Clearing	*4,641*
Corwith	*800*
Gibson	*438*
Kirk	*2,378*
Markham	*368*
Proviso	*1,195*
Other Yards *See EP 724 (Sub-No.3)*	*0*

2. Average Daily Number Of Trains Held For Delivery To Chicago	
CN	*0.00*
BRC	*0.00*
BNSF	*0.43*
CP	*0.00*
CSXT	*0.43*
IHB	*0.00*
NS	*0.00*
UP	*0.00*

NARRATIVE SUMMARY OF OPERATING CONDITIONS

Chicago Integrated Rail Operations Center (CIROC) is staffed 24/7 to monitor and facilitate rail operations. CIROC has direct connections with each carrier and track views to identify issues and assist in their resolution to address congestion and reduce delays.

The Chicago Terminal Operating Condition (OpCon) Agreement provides the framework necessary to quickly identify and mitigate, to the degree reasonably practicable, potential and current operating conditions or events that would negatively impact rail traffic moving via the Chicago Gateway. Safety of operations is integral throughout the OpCon plan processes.

The plan provides for an automated monitoring of terminal, yard, corridor and weather conditions linked to specific levels of volume/activity which could adversely impact terminal operations. These metrics, when exceeding preset levels will require predetermined countermeasures geared to effectively remove a set percentage of cars/trains from the affected location(s) in order to restore fluidity of operations.

Further deterioration of the automatic indicators will require additional, predetermined, focused countermeasures geared to remove an even greater percentage of volumes to expedite a more rapid recovery, while enabling unaffected areas to continue a more normal operation.

Overall Terminal Operating Conditions and Individual Yard, Road or Corridor conditions that impact operations are monitored and categorized separately for purposes of required countermeasures. The Operating Conditions are defined as Green, Yellow and Red. Actions between railroad partners range from a creation of by-pass traffic to specific diversion of Chicago traffic (cars and trains) to other gateways.

CIROC is charged with implementation and management of the Chicago Terminal Operating Condition Agreement which includes quick escalation in cases of ineffective or insufficient countermeasures.

CHANGE (+/-) IN REPORTED NUMBERS:
Reported numbers remained similar to last week.

OPCON (ALERT LEVEL) CHANGES:
There were no Elevated Levels during the report period.

EVENT(S) THAT AFFECTED OPERATING CONDITIONS:
There were no Major Events affecting the Terminal.

CIROC-reported issues generally receive significant attention, and railroad "short-term fix" response is rapid.

Also, if the potential CBR volume created by a possible Line 5 shutdown were indeed to be handled by CN, that railroad's traffic from Wisconsin can move directly to its Chicago Terminal Markham Yard in a "bypass" fashion, not requiring interchange to another carrier or any other sources of significant delay. This traffic would then be moved via CN to Sarnia, with no other carrier involvement. CN's rail lines, either owned or used via trackage rights, are shown in Figure 29, and Markham Yard is highlighted (yellow star).

In summary, establishment of CIROC and other initiatives of CN and its fellow Chicago terminal railroads have created a proactive approach to systematically mitigate delay and congestion, greatly reducing any risk that potential new rail traffic generated by a Line 5 shutdown would somehow cause a chain reaction of delays in Chicago that would then threaten rail shipping and commerce in Wisconsin.

Figure 29

From page 61 of the Rennicke Report:

> *"At-grade crossings represent one of the largest safety concerns of train operations, as motorists often think they have time to drive around a crossing gate if they do not see a train. A federal program, Operation Lifesaver, has invested hundreds of millions of dollars in improving the safety of at-grade crossings and in educating drivers. The result has been a steady lowering of the rate of fatalities associated with at-grade crossings. But as exposure increases, either through an increase in automotive traffic or increase in rail traffic, the number of accidents can increase. Furthermore, the perception that trains are blocking crossings longer and more often at a given location could lead motorists to take more risks.*

The addition of Line 5 product volume would exacerbate this situation on any rail route, as crossings would be impacted by the addition of up to eight 100-plus car trains per day. This impact would include additional wait times for road vehicles at crossings, leading to increased congestion on streets leading up to crossings. Public safety could be impacted if police and fire departments are unable to travel efficiently due to blocked crossings, or ambulances must wait to reach hospitals.

As an example, along the 410 miles in Wisconsin of the most direct rail route from Edmonton to Sarnia, the rail line crosses 358 public roads and several hundred more private roads (such as driveways to plants, offices, and residences).”

PLG comments: This foray by the Rennicke Report into the topic of grade crossings is another red herring. To follow the logic being argued, no railroad should ever entertain any new business because of potential increases in crossing delays and accidents. Further, these slippery slope[56] arguments (…*the perception that trains are blocking crossings longer and more often at a given location could lead motorists to take more risks…;” “Public safety could be impacted if police and fire departments are unable to travel efficiently due to blocked crossings, or ambulances must wait to reach hospitals”)* still fail to justify why alternative logistics solutions for a potential Line 5 shutdown are either unavailable or unviable. And, once again the Rennicke Report falsely assumes that all of the new potential rail volume contempated would have to be shipped over just one particular rail route.

Even if these false assumptions were accepted at face value, the Rennicke Report omits key facts regarding the particlar line that it has chosen to belabor. The Federal Railroad Administration’s Office of Safety Analysis website provides specific Highway Rail Accident Data. In 2021, there were ten (10) rail/vehicle incidents reported to Federal Railroad Administration for the CN central Wisconsin line from Superior to the Illinois border (Superior, Neenah and Chicago Subdivisions), with the accident causes as follows:

- TRAIN U25051-02 STRUCK A STALLED RV ON THE CROSSING. RV WAS NOT OCCUPIED AT THE TIME OF INCIDENT
- DRIVER OF SEMI TRUCK FAILED TO YIELD AND WAS STRUCK BY TRAIN Q19991-21.
- VEHICLE OPERATOR FAILED TO STOP AND RAN INTO THE SIDE OF TRAIN M34791-06.
- PICK UP TRUCK FAILED TO STOP AT CROSSING AND WAS STRUCK BY APPROACHING TRAIN.
- PEDESTRIAN RAN INTO THE SIDE OF TRAIN AND SUSTAINED FATAL INJURIES.
- DRIVER FAILED TO STOP AT INDUSTRY CROSSING AND WAS STRUCK BY TRAIN L59581-17. CROSSBUCKS AND YIELD SIGNS PROTECT CROSSING.
- Q19991-24 REPORTED STRIKING AN ABANDONED VEHICLE ON THE CROSSING.
- TRAIN Q19651-26 STRUCK A VEHICLE THAT WAS PARTIALLY STOPPED ON THE CROSSING.
- WESTBOUND DRIVER STOPPED AT THE CROSSING THEN PROCEEDED IN FRONT OF TRAIN M35791-24.

[56] A **slippery slope argument** (**SSA**), in logic, critical thinking, political rhetoric, and caselaw, is an argument in which a party asserts that a relatively small first step leads to a chain of related events culminating in some significant (usually negative) effect.[1] The core of the slippery slope argument is that a specific decision under debate is likely to result in unintended consequences. (From Wikipedia: https://en.wikipedia.org/wiki/Slippery_slope)

- DRIVER FAILED TO STOP AT CROSSING AND WAS STRUCK BY TRAIN Q11791-04.

In each case, the railroad and its operations were not at fault, and crossings were protected.

More broadly, the amount of time any crossing is blocked by a train is either mandated by law or negotiated between a serving carrier and the community/county where the crossing is located. Crossings utilized by emergency vehicles are given top priority for minimizing railroad occupancy and also designating alternate routes for vehicular traffic that support minimization of emergency response time. State, county and local agencies have and continue to actively work with railroads to close crossings in the interest of safety and mutual benefit and with the support of the U.S. Department of Transportation's Federal Railroad and Highway Administrations. CN, like all other U.S. railroads, has annual crossing closure goals as well as community outreach safety programs to raise crossing safety awareness and provide education resources.

From page 63 and 64 of the Rennicke Report:

> *"As described in Section II, in addition to transporting crude oil, Line 5 delivers NGLs to Plains Midstream facilities in Superior, where it is converted to propane for regional use; Rapid River, where it is converted into propane and sold to residents and businesses in Michigan's Upper Peninsula; and Sarnia, where it is converted into propane and butane. The Superior, Rapid River, and Sarnia fractionators will close if Line 5 shuts down, as there is no feasible alternative to supply them with required volumes of NGLs."*
>
> *"For the propane currently produced in Superior and distributed regionally, this relatively low volume makes it feasible that sufficient rail or truck fleets could be acquired to ship propane from Edmonton."*

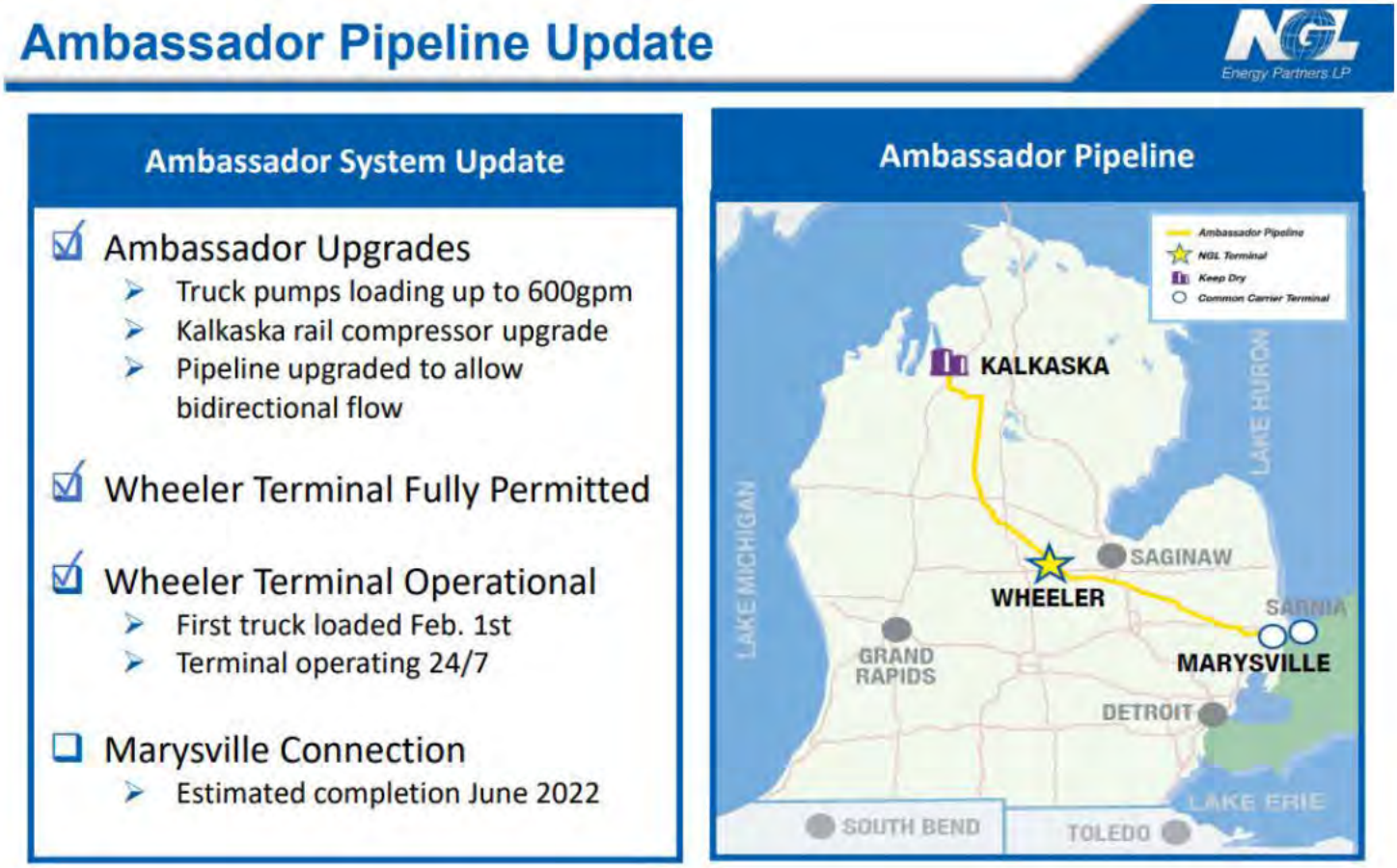
PLG comments: In the event of a Line 5 shutdown, the Superior fractionator would still have access to pipelined NGLs from Edmonton. The Superior fractionator could continue to receive the propane/butane mix from the pipeline and fractionate out the propane and butane. The propane could continue to be distributed out of Superior, as is currently happening today. The butane, however, would not be able to be injected back into Line 5. Refineries bring in butane, particularly in the winter, to blend into their gasoline. There are two refineries in St. Paul, MN (less than 170 miles from Superior) that could be potential demand sites for the butane. The existing truck loading rack at the Superior fractionator could likely be used for short distance destinations like St. Paul, MN. For long-distance deliveries, rail would be more ideal.

Potential new rail infrastructure at the Enbridge Superior Terminal (which shares a property line with the Superior fractionator) or existing rail infrastructure at the Cenovus Superior Refinery could be potential options for loading butane railcars. If the Rapid River fractionator were to close but the Superior fractionator continued to operate, the Superior fractionator could likely increase its throughput and serve some of the propane demand between Superior and Rapid River. Also, in the event that the Superior fractionator were to close, propane (instead of a propane/butane mix) could be injected into the pipeline at Edmonton and the existing Superior storage and distribution infrastructure could continue to be utilized to distribute propane out of Superior.

Elsewhere, NGL Energy Partners's Ambassador Pipeline goes from Marysville, MI to Kalkaska, MI as illustrated in Figure 30. NGL Energy Partners acquired this pipeline in March 2021,[57] and is making significant investments in propane distribution that will allow for more efficient delivery throughout Michigan.

[57] https://www.lpgasmagazine.com/ngl-supply-wholesale-acquires-ambassador-pipeline/

Figure 30



"Focused on being the most reliable propane supplier in the state"

From page 64 of the Rennicke Report:

> *"In addition, propane unloading facilities would need to be constructed in Superior."*

PLG comments: There is already an existing propane unloading facility in the Superior-area: Superior Fuel has a rail unloading terminal in Duluth, MN with a storage capacity of nearly one million gallons of propane.[58]

From page 64-65 of the Rennicke Report:

> *"Rail shipments of propane into Superior would be more economically viable, but at only five cars per day, it is unlikely the railroads would place a high priority on such a low volume movement. In addition, propane unloading facilities would need to be constructed in Superior."*

> *"Rail is infeasible as well, since the Rapid River terminal is not rail-served. Some shortfall volume could be served by propane retailers who receive via rail in Gulliver and Gladstone, but the low volumes (less than three loaded cars/day) would not be an attractive move for a railroad."*

[58] https://www.fox21online.com/2021/09/15/superior-fuel-opens-new-rail-terminal/

PLG comments: We disagree with the statements that characterize the propane volumes presently distributed out of Superior and Rapid River as not being large enough to be attractive for railroads, and also the claim that it is "infeasible" to supply northern Wisconsin and Michigan's Upper Peninsula with propane via rail.

Rail movements of 3-5 carloads of propane per day are significant volumes and would be seen as attractive to any Class I or short line railroad. While there would be startup costs associated with a switch to rail, the potential volumes involved are more than adequate to justify private capital investment to build unloading infrastructure. Many regional and individual propane terminals across the U.S., Mexico and Canada are regularly supplied with manifest rail service. Numerous examples can be cited, including:

1. Crestwood, a major propane supplier, operates a network of nine rail terminals in the eastern US.[59] Each of these facilities handle manifest volumes of propane by rail.
2. The Grafton & Upton Railway developed a propane rail terminal in 2018 to bring in propane to Massachusetts. The terminal has eight loading spots.[60]
3. On the U.S. West Coast, rail is the primary mode used to deliver propane to California, Oregon and Washington distributors and butane to refineries.
4. Additionally, distributors could quickly set up LPG supply points using railroad team tracks and rail-to-truck transloaders. The transloaders can be fixed or mobile.

A 2020 study commissioned by the Governor of Michigan to explore potential propane supply alternatives to the Upper Peninsula in the event of a disruption to Line 5 operations identified rail sourcing from Edmonton as the lowest-cost option, stating that "The most competitive options from Edmonton are transported by rail either directly to the delivery site or to a site in the vicinity and then trucked to the final destination. Even with additional investment in storage capacity considered in the cost, Edmonton (rail) options proved competitive with observed prices at Rapid River and Sarnia." The report concluded, "As long as Edmonton (propane) prices are low and rail operations are reliable, this option will be a cost-effective supply alternative." [61]

Rail delivery (or, in some cases, multimodal options like pipeline-to-rail or pipeline-to-truck) also increases flexibility to access the growing supply of U.S. propane, opening up other potential major propane sources like Conway, KS, Gulf Coast sources, and production from the Utica and Marcellus Shale plays in Ohio and Pennsylvania. All of these sources have multiple rail-served origination sites that could increase shipments to Michigan consumers. And, considering that U.S. propane production has more than doubled over the last decade, alternative supplies should be plentiful.[62]

Another area that should not be discounted as a significant source for Upper Peninsula propane customers is the nearby underground storage capacity that is already present in the Sarnia area (including Sarnia, Windsor, Corunna, ON and Marysville and St. Clair, MI), totalling close to one billion gallons.[63] Even though a disruption in Line 5 activity would likely reduce propane production from the Sarnia fractionator, at least in the short term, the area will continue to be a major propane hub supplied by other pipelines and rail sources. There is already significant propane loading infrastructure in the region.

[59] https://www.crestwoodlp.com/operations/storage-logistics/storage-assets/default.aspx
[60] Energy Transport Insider, *Grafton, MA Rail Propane Terminal Opening Projected by Labor Day*, 7/25/2017
[61] Public Sector Consultants for Michigan Department of Environment, Great Lakes, and Energy and Michigan Public Service Commission, *Analysis of Propane Supply Alternatives for Michigan*, revised April 2020, pp. 82-83.
[62] U.S. EIA {2011 production: 230.2 mm bbls; 2021 production: 632.9 mm bbls}
[63] Michigan Public Service Commission, 2019

In December 2021, the STB approved the purchase by short line holding company Watco of rail lines in Wisconsin and Michigan from the CN. Watco's operation of the 650-plus miles of rail lines is expected to begin in early 2022.[64] Figure 31 is a map of selected rail lines in Wisconsin and Michigan that highlights the routes acquired by Watco.

Figure 31

Like many other shortline operators, Watco is also known for expanding volumes on lines acquired from Class I railroads and could be expected to work proactively to accommodate new propane transload business within its new Wisconsin and Michigan service territory.

[64] Trains.com, *STB approves Watco purchase of Wisconsin, Michigan lines from CN*, 12/20/2021

From page 67 of the Rennicke Report:

> *"The calculations for the rail line capacity follow the methodology described in Association of American Railroads "National Rail Freight Infrastructure Capacity and Investment Study"".*

PLG comments: This approach is inappropriate as the 2007 methodology is not valid for line-specific analysis, as previously noted. The Rennicke Report methodology of breaking the route into twelve segments is meaningless vs. considering dispatching territories, and its assumptions relative to current conditions (trains per day and line capacity) are unsubstantiated by valid data. In order to be valid, train counts must be current and obtained directly from the serving railroad.

From page 69 of the Rennicke Report:

> *"Monthly tank car lease rate for propane is $1,000"*

PLG comments: The current lease value for pressure tank cars used for propane is approximately $700/month for a multi-year deal.[65]

Notwithstanding the vigor with which the Rennicke Report asserts that no alternative supply chain solutions are available or operationally viable to accommodate Line 5 products and markets in the event of a shutdown, it is an assertion that is simply false. As noted above, this assertion is often based on incorrect facts or flawed arguments, and is contradicted by the several examples cited by PLG of alternate origins, modes, nodes, and routes that could supply crude and NGLs to Line 5 markets. A summary of those alternate supply chain solutions is presented in Section IV of this report.

[65] Conversation with Clifton Linton from Energy Transport Insider, February 2022

III. Page-by-Page Opinion, Commentary, and Rebuttal Regarding the Earnest Report

Provided below is a sequential page-by-page review of content and statements within the Earnest Report that PLG believes warrant comments and/or rebuttal. We have provided page references plus verbatim excerpts of the content/statements in question, followed by our observations.

From page 9 of the Earnest Report:

> *"Refined products shortages may lead to panic buying, creating additional shortages and prices increases, making a problematic situation even more difficult. "*

PLG comments: This statement implies that no other alternative logistics solutions for crude and NGL feedstocks, or refined products to and within the Line 5 delivery region, are available or feasible. As we demonstrate throughout our report, there are multiple alternative supply chains that can be implemented. As such, this statement of the Earnest Report is hyperbolic and also a slippery slope argument.

From page 11 of the Earnest Report:

> *"There is no prospect for a new crude oil pipeline to take the place of Line 5, and even the construction of new rail unloading facilities will take years."*

PLG comments: This statement is problematic on several counts:

1. It only mentions a new crude oil pipeline and ignores the possibility of pipeline expansions or reversals. A pipeline expansion is a much more logical solution than a new crude oil pipeline because of permitting, cost, and time requirements. A potential Line 78 expansion would increase the capacity of Western Canadian crude oil to Sarnia, ON which is the termination point of Line 5. A Line 78 expansion would mostly consist of the simpler process of increasing compression rather than replacing all of the pipe. The ultimate annual capacity of line 78A could be as much as 800 kbpd (from 570 kbpd[66]) and the ultimate annual capacity of Line 78B could be as much as 525 kbpd (from 500 kbpd[67]).[68] Expansion of Line 78 capacity appears to be a viable option given all of these factors.

   Another potential option not requiring a new pipeline is the re-reversal of Line 9. Line 9 is a crude oil pipeline, originating at Sarnia, ON, and terminating at Montreal with a capacity of 300 kbpd.[69] The pipeline was first built in 1976 to carry crude oil from Sarnia to Montreal. Its first reversal was in 1998 and it was then reversed again in 2015 back to its original flow direction.[70] Reversing Line 9 another time would facilitate new crude flows to Sarnia, ON of approximately 300 kbpd, supplied by waterborne imports from the US and overseas sources. As describe in

[66] https://www.enbridge.com/~/media/Enb/Documents/Factsheets/FS_EnergyInfrastructureAssets.pdf?la=en
[67] https://www.enbridge.com/~/media/Enb/Documents/Factsheets/FS_EnergyInfrastructureAssets.pdf?la=en
[68] ESAI Energy, LLC, *Report for the Bad River Band of the Lake Superior Tribe of the Chippewa Indians on The Impact of the Shutdown of Enbridge Line 5 on the Flow of Crude Oil to Refiners*
[69] https://www.enbridge.com/~/media/Enb/Documents/Factsheets/FS_EnergyInfrastructureAssets.pdf?la=en
[70] https://www.cbc.ca/news/canada/montreal/enbridge-line-9-reversal-alberta-montreal-1.3344517

Section IV of this report, the Quebec refineries currently receiving crude from the presently east-flowing Line 9 could replace that supply with waterborne deliveries, some of which may be able to arrive via the Portland Pipeline.

2. The statement only mentions new rail unloading facilities, but existing rail unloading facilities are already in place in Sarnia, Corunna, Toledo, Nanticoke, Montreal, and Quebec City as identified earlier.

3. Unloading facilities can be built in less than "years." As detailed earlier, there have been facilities in more urban areas built in as few as 15 months.

From page 16 of the Earnest Report:

"The Superior fractionator is entirely reliant upon the continued operation of Line 5, because Line 5 is the means by which the Superior fractionator disposes of the unneeded butanes."

PLG comments: It is an overstatement to say the Superior fractionator is "entirely reliant" upon Line 5, because it implies that there are no other possible takeaway options for the butanes at Superior besides Line 5. Butanes would be marketable to various refineries in the upper Midwest, and could potentially be delivered via truck at a reasonable cost to the nearby (170 miles) refineries in St. Paul, MN. With additional rail loadout capability as described earlier in our report, butanes could also be shipped via rail to NGL cavern storage facilities near Sarnia during the offseason. The butane offtake requirement at Superior under such a scenario would amount to approximately two railcars per day, a manageable volume for manifest service and loading rack requirements.

Also, the Superior fractionator is a relatively simple fractionator given that it only fractionates out propane from a propane/butane mix. In the event the butanes were uneconomical to distribute from Superior, propane could be fractionated in Western Canada before being injected into the pipeline. All of the other infrastructure at the Superior fractionator site such as storage and truck loading could continue to be utilized to distribute propane as it is today.

From page 20 of the Earnest Report:

"If the Plains Superior, Rapid River, and Sarnia fractionators were to lose their NGLs feedstock from Line 5, there is no immediate NGLs feedstock alternative. Furthermore, all three of the Plains facilities are designed to produce propane and butanes from NGLs comprised nearly entirely of propane and butanes. This is an unusual NGLs product type that is generally only available in Western Canada because the other components typically found in NGLs, such as ethane and natural gasoline, are removed in Canada for use there."

PLG comments: There are multiple de-ethanization plants in the Marcellus/Utica region that extract ethane from "Y-grade," leaving a C3+ mixture which is composed of propane, butanes, and natural gasoline. As an example, MPLX has de-ethanization at their Majorsville, Mobley, and Sherwood complexes in West Virginia.[71] Once the ethane has been extracted, the only component left in the C3+ mixture that the Sarnia fractionator currently is not fractionating is natural gasoline. Natural gasoline is only 10% of the "Y-grade" mixture in the Marcellus/Utica,[72] so the additional processing would be significantly less than implied in the Earnest Report.

[71] https://www.mplx.com/About_MPLX/Gathering_and_Processing/MarcellusUtica_Operations/
[72] Muse Stancil, *Expert Report of Neil K. Earnest*

From page 22 of the Earnest Report:

> *"No single supply source will be able to replace the approximately [redacted] b/d of propane and [redacted] b/d of butanes produced from the NGLs delivered by Enbridge in 2019 to Superior, Rapid River, and Sarnia"*
>
> *"A supply loss of this size can only be met from a number of supply sources, likely consisting of some combination of NGLs fractionation facilities located in Alberta, the Midcontinent, the Marcellus/Utica Shale area, and the Gulf Coast. This will result in a more logistically complex and costly supply chain for propane consumers in northern Wisconsin and Minnesota, Michigan, Ontario and northern Ohio markets."*

PLG comments: These statements imply that multiple supply sources are a bad thing. Optionality is a good thing to have in logistics and energy trading. Supply and logistics problems can develop with any source or mode, so it is good to be able to pivot to other sources quickly to mitigate any issues. Market prices change between supply sources, so being able to pivot to whichever market source gives the lowest delivered cost is beneficial.

From page 25 of the Earnest Report:

> *"It is my assessment that the Asia-Alberta price differentials are wide enough such that propane exports to Asia from Alberta will continue and these volumes will not be available to supply the Midwest and Eastern Canada"*

PLG comments: This statement made in the Earnest Report supports the proposition that the Line 5 delivery area should be looking for alternative supply sources even while Line 5 is operational in order to rely less on Western Canada supply, which by the Earnest Report's own account could be diverted to the Asian export market. The Marcellus/Utica is significantly closer to Sarnia, ON than Western Canada, which makes it a logical source to consider. Now that both Western Canada and Marcellus/Utica propane producers are playing the export markets, it would be logical for Sarnia to establish supply chains from both origins to create additional supply optionality as export markets evolve and regardless of what happens to Line 5.

From page 29 of the Earnest Report:

> *"I estimated that about 17,000 b/d of propane would be available for Michigan and Ontario"*
>
> *"An estimated 165,000 b/d of propane from the Marcellus/Utica Shale NGLs fractionators is transported by the Mariner East pipeline system to Marcus Hook."*

PLG comments: The 17 kbpd of propane that the Earnest Report estimates would be available for Michigan and Ontario appears to be calculated by subtracting an estimated 2019 disposition from an estimated 2019 supply. First, it is unclear on where the existing mismatch of supply vs. disposition went in 2019. Second, it should not be automatically assumed that all volume that was transported by the Mariner East pipeline system (165 kbpd, primarily for exports) will continue if an increase in domestic demand occurs.

From page 29 of the Earnest Report:

> *The Mariner East 2 pipeline has approximately 192,500 b/d of propane transportation commitments*

PLG Comments: It appears that the Earnest Report has over-interpreted this statement from its own cited sources. Of the two sources listed, Energy Transfer Partners only says Mariner East 2 is "supported by long-term, fee based contracts.[73]" And, Antero has 50 kbpd of firm capacity on Mariner East 2, comprised of 35 kbpd for propane and 15 kbpd for butane, representing nearly one-third of the total Mariner East 2 capacity today.[74] This is only 50 kbpd of firm capacity, which does not necessarily mean it is all take-or-pay (or at what price) vs. the 192.5 kbpd of propane "transportation commitments" cited by the Earnest Report.

From page 35 of the Earnest Report:

> *Absent major investment, it appears the Kincheloe terminal has little capacity to significantly increase propane supply.*

PLG comments: First, "major investment" is a relative term. Secondly, the property owner of this facility, the Chippewa County Economic Development Corporation, is completing a $2.7 million rail enhancement to increase the facility's capacity. The expansion is being funded in part by the State of Michigan Freight Economic Development Program (FEDP) and in part through private sector investment.[75]

From page 36 of the Earnest Report:

> *"DCP Midstream Partners Marysville NGLs facility provides storage services to the Sarnia refining and petrochemical sector as well as the Sarnia fractionator through the Plains Sarnia Downstream System pipeline… Since this facility obtains its propane via Line 5, it has no ability to address the propane supply shortfall created by a Line 5 shut down."*

PLG comment: While this facility with its substantial storage capacity is presently served by Line 5, that does not mean that it could not be supplied by other means if Line 5 shuts down. In fact, this facility is rail served and could receive butane and propane by rail, store the products during "off-season," and then pipe/rail/truck out. It is pipeline-connected to area refineries.[76]

From page 38 of the Earnest Report:

> *"To replace the [redacted] b/d of lost propane supply, Superior will likely have to rely on truck deliveries from a number of propane rail terminals scattered across Wisconsin and elsewhere in the Midwest."*

PLG comments: First, it is unclear why, in a potential future state if propane is no longer terminated and distributed off Line 5 in Superior, the Earnest Report assumes that all replacement propane from other sources would need to be delivered to Superior. Presumably the Superior fractionator distributes propane locally and regionally. The specific destination end points could be serviced directly by future alternate supply points and would not need to first go through Superior.

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[73] https://ir.energytransfer.com/static-files/502ded10-ef44-467d-9c4f-6fbb67046022, page 25

[74] https://www.anteroresources.com/investors/news-events/press-releases/detail/167/antero-resources-reports-first-quarter-2019-financial-and

[75] https://www.michigan.gov/documents/mdot/Propane_by_Rail_in_Michigans_Upper_Peninsula_745595_7.pdf

[76] https://www.michigan.gov/documents/mdot/Propane_by_Rail_in_Michigans_Upper_Peninsula_745595_7.pdf

Secondly, if it were assumed that the replacement supply still needed to flow through Superior, we have already indicated elsewhere in our report [pages 9-11] that sufficient land exists at the Superior Terminal to add rail track and offload infrastructure to facilitate rail deliveries instead of truck. In addition, there is already an existing propane rail terminal in Duluth, MN that can be utilized as well.[77]

From page 39 of the Earnest Report:

> *"According to the American Transportation Research Institute ("ATRI"), the tanker truck marginal cost per mile was $2.155 in 2018. The marginal cost reflects the operational costs of the tanker truck, including fuel, truck lease payments, maintenance, insurance, driver wages, and driver benefits.*[65] *Based on the average distance between Superior and these rail terminals, I estimate that shutting down Line 5 will increase the cost of propane to Wisconsin consumers by $4 million per year. I regard this cost estimate to be conservative (i.e., low), because the trucking distance to the most distant rail terminal required to satisfy demand will generally establish the propane price in the Superior area. The calculation details can be found in Workpaper 1. "*

PLG comments: This statement is problematic on several counts:

1. Using this "marginal cost per mile" from ATRI is an unsound basis for estimating truck rates. It would not be considered a reliable or industry-standard metric to determine truck delivery costs.

2. The entire premise that replacement volumes of propane for Line 5 would terminate at regional rail facilities and then be trucked to Superior doesn't make sense. If the product is consumed right in Superior, then a local propane transload would be established (or existing facilities would be used). If the Superior fractionator is serving truck-served last mile destinations, then there would be no reason to truck the product to Superior in the first place.

3. As part of a potential redesign of the regional propane supply chain, a proper network optimization process would be performed that captures all the final destination points with their respective volumes. Then, running an optimization model would indicate where to expand existing or locate new rail distribution and storage terminals. This exercise would be done for the propane offtakers from both the Superior fractionator and the Rapid River fractionator. The Earnest Report accounts for none of this.

4. Lastly, the Earnest Report nowhere explains why, if Line 5 were to cease operations east of Superior, that propane or a propane/butane mix cannot still travel the Enbridge system from Western Canada and simply terminate at Superior to meet local and regional demand. We discuss this idea above on page 46.

From page 42 of the Earnest Report:

> *"Even assuming that a NGLs rail unloading facility could be permitted and build in the Sarnia area"*
>
> *"Supplying about 80,000 b/d of NGLs to the Sarnia fractionator would require a unit train operation, about 110 cars every day, but the NGLs are not available at a single location to load unit trains"*

[77] https://www.lpgasmagazine.com/superior-fuel-co-builds-supply-security-with-new-rail-terminal/

PLG comment: As stated earlier in our report, VIP Rail has two facilities in Sarnia area that are capable of offloading NGLs from rail. And, in terms of origination, NGL unit train loading facilities exist in the Bakken, Marcellus/Utica, and in Western Canada.

From page 43 of the Earnest Report:

> *"Historically, Michigan wholesale propane prices have been on average 12 percent lower than in neighboring Indiana and 9 percent lower than in Ohio"*

PLG comment: It is incorrect to assume that, absent a Line 5 shutdown, Michigan propane prices will continue be that much lower in price than Ohio. The Earnest Report on page 25 states that Western Canada now has access to Asian markets through marine exports (that started in Mid-2019), which has given Alberta more demand and an outlet to non-North American markets. Given that Michigan has enjoyed historically lower propane prices because of its access to traditionally landlocked/stranded Alberta propane, this historical Michigan price advantage could change as increased exports of Alberta propane occur off the west coast.

From page 67 of the Earnest Report:

> *"The crude oil shipments by rail required to replace Line 5 are 290,000 b/d"*

PLG comment: It is unclear as to why this number is used after a smaller number (227,000 b/d) is referenced in the prior paragraph. Also, this very definitive statement appears to assume that no pipeline expansions by either increased compression or use of drag reducing agents can be made. As discussed elsewhere in this report, there is the possibility of both of a Line 78 expansion and a Line 9 reversal that could potentially reduce, if not eliminate, any shortfall in crude oil supplies arising out of the shutdown of Line 78.

This statement also assumes that no increase in refined products imports to the region can be used to offset lower crude runs should they occur, though elsewhere the Earnest Report states that Michigan, Wisconsin and Ontario already rely on substantial volumes of refined products from other states and that an increase in those imports would have a negligible impact on consumer prices (0.5-1.0 cents a gallon of gasoline in Michigan and Wisconsin; 4-6 cents a gallon in Ontario).

In PLG's view, both strategies for crude and refined products supply are viable options.

From page 110 of the Earnest Report:

> *Workpaper 7 (Analysis of Enbridge 2019 form 6)*

PLG comment: The purpose and calculations of this table are unclear. However, the recent (2021) Line 3 expansion increased capacity significantly (by 380 kbpd)[78] so any analysis from 2019 Enbridge data would be invalid.

In summary, the Earnest Report contains similar problems as the Rennicke Report in asserting incorrectly that alternative logistics and supply options for Line 5 products and markets are unavailable or unviable.

[78] https://www.reuters.com/business/energy/enbridge-completes-line-3-oil-pipeline-replacement-project-starts-linefill-2021-09-29/

IV. Summary of Potential Alternative Supply Chain Solutions for Line 5 Products and Markets in the Event that Line 5 Ceases to Operate Through the Reservation

As noted in the introduction of this report, a foundational premise of the Rennicke Report is that alternative logistics solutions for Line 5 products and markets either do not exist or are operationally infeasible. To support that view, the Rennicke Report provides numerous statements and arguments that, as we have explained, are demonstrably false. The Earnest Report takes a similar position.

PLG has woven throughout its responses to suspect Rennicke Report and Earnest Report statements a variety of supply chain alternatives that can be pursued for Line 5 products and markets. In this section of our report we are providing a summary of those supply chain alternatives as follows:

1) Potential Line 78 pipeline initiatives for crude
2) Increase of waterborne shipments to Quebec
3) Line 9 re-reversal
4) Refinery-specific crude logistics solutions involving pipe, rail, and water
5) Multi-modal logistics solutions for NGLs

Shortfall of Line 78 Capacity vs. Line 78 and Line 5 2021 Volumes

In assessing different options for a Line 5 shutdown, it is important to first "table set" with an understanding of how Line 78 and Line 5 presently serve specific refineries today:

Figure 32: Estimated Deliveries from Lines 78/5 to 10 Refineries (000 b/d) in 2021 (Q1-Q3)[79]

Refinery	ex-Line 78/5
Sarnia - Imperial	102
Sarnia - Shell	74
Sarnia - Suncor	77
Nanticoke - Imperial	95
Montreal - Suncor	125
Quebec City - Valero	76
Detroit - Marathon	82
Toledo - PBF&BP	166
Warren, PA - United	64
2021 Total	**861**

The next step is to analyze the current capacities of pipelines involved with supplying crude oil from Line 78 and Line 5. This allows calculating the volume that Line 78 could handle with a Line 5 shutdown. Figure 33 illustrates these pipelines along with their capacities.

[79] ESAI Energy, LLC, *Report for the Bad River Band of the Lake Superior Tribe of the Chippewa Indians on The Impact of the Shutdown of Enbridge Line 5 on the Flow of Crude Oil to Refiners*

Figure 33

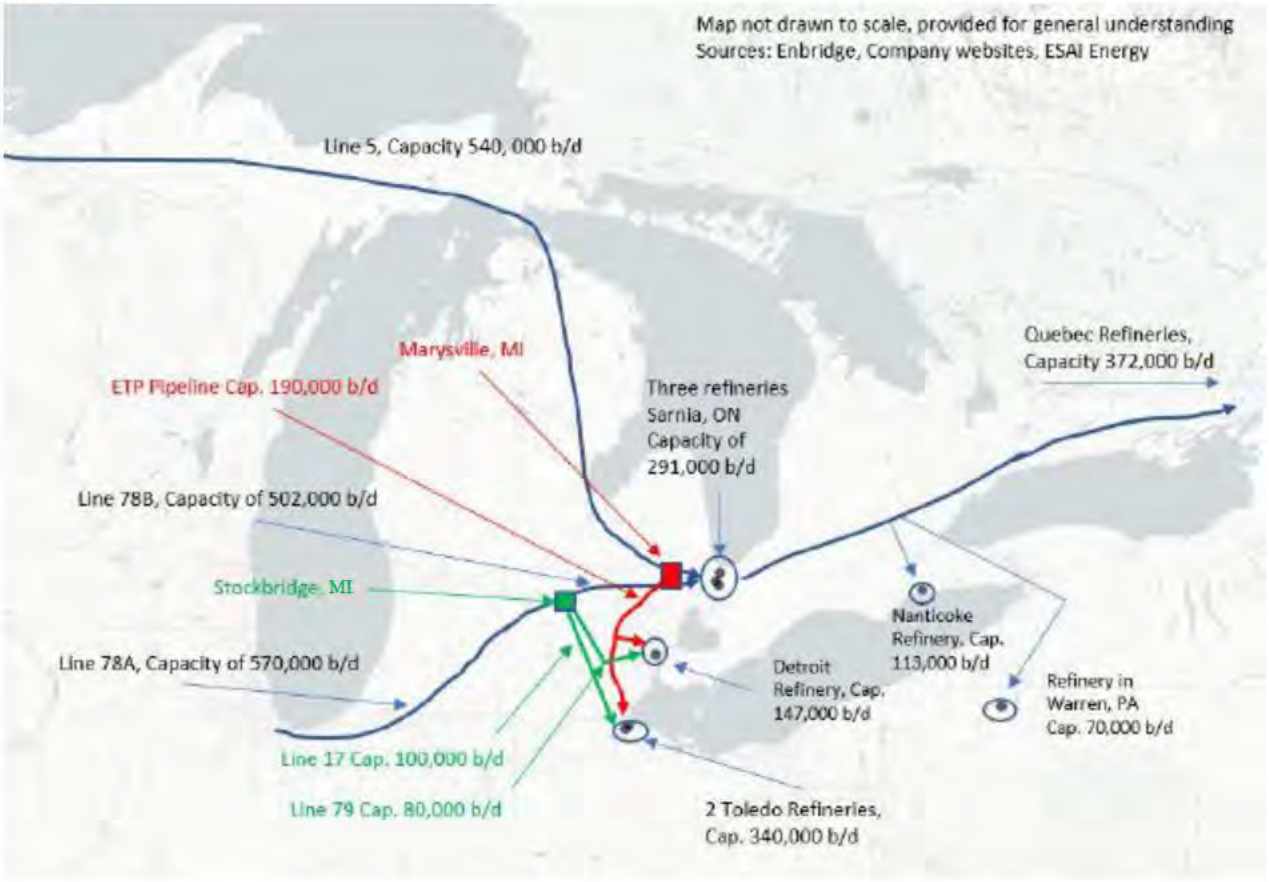


Figure 34: Line 17 and Line 79 Capacities and Throughputs

	Capacity (kbpd)	2021 YTD Throughput (kbpd)[80]
Line 17 (Toledo)	100	51
Line 79 (Detroit)	80	50
Total	**180**	**101**

As illustrated in Figure 33, Line 78A distributes crude oil to Line 17, Line 79 and Line 78B. Line 78A has a capacity of 570 kbpd, and in 2021 Line 78A delivered a total of 101 kbpd (Figure 34) to Line 17 and Line 79. After delivering 101 kbpd to Line 17 and Line 79, Line 78A would be able to deliver 469 kbpd to Line 78B. Line 78B's capacity of 502 kbpd would be sufficient to receive this 469 kbpd from Line 78A. Therefore, Line 78A's capacity of 570 kbpd is the limiting factor in delivering more crude oil to these refineries in the event of a Line 5 shutdown.

The shortfall of crude oil that Line 78 could supply vs. 2021 volumes supplied by both Line 5 and Line 78 is 291 kbpd. This is calculated by taking the 861 kbpd supplied in 2021 and subtracting Line 78A's capacity of 570 kbpd.

[80] ESAI Energy, LLC, *Report for the Bad River Band of the Lake Superior Tribe of the Chippewa Indians on The Impact of the Shutdown of Enbridge Line 5 on the Flow of Crude Oil to Refiners*

Line 78 Expansion

Perhaps the first and best opportunity to enable an alternative supply of crude via other pipelines would be the expansion of Line 78, primarily through increased compression within the line. The ultimate annual capacity of Line 78A with an expansion could be as much as 800 kbpd (from 570 kbpd) and the ultimate annual capacity of Line 78B could be as much as 525 kbpd (from 500 kbpd[81]).[82] The Earnest Report calculates a Line 5 delivery area would be allocated 769.7 kbpd if Line 5 is shutdown [assuming apportionment on the Enbridge Superior-to-Chicago segment].[83] For the purpose of this analysis, a conservative maximum capacity of 769.7 kbpd for expanded Line 78A will be assumed because of the potential apportionment on the Enbridge Superior-to-Chicago segment. The Line 78 expansion would mostly involve increasing the pressure of the pipeline by adding compression (vs. replacing with bigger pipe or twinning the pipeline). An expanded Line 78A would be able to deliver 589.7 kbpd to expanded Line 78B after filling Line 17 to and Line 79 to their full capacities as calculated in Figure 35.[84]

The limiting factor on crude flows to Sarnia would thus be expanded Line 78B's capacity of 525 kbpd.[85] The total crude oil capacity delivered by an expanded Line 78 system would be 705 kbpd. This includes the 180 kbpd that could be delivered from Stockbridge to Toledo and Detroit and 525 kbpd to Sarnia. The shortfall of crude oil that an expanded Line 78 would supply vs. 2021 volumes supplied by both Line 5 and Line 78 would be 156 kbpd.[86]

Figure 35

Expanded Line 78 System	Capacity (kbpd)	Capacity Required to Fill Line 17 & Line 19 (kbpd)	Capacity After Filling Line 17 & Line 79 (kbpd)
Line 78A	769.7	180	589.7
Line 78B	525	0	525

Increase Waterborne Imports to Quebec City and Montreal

Valero Quebec City currently receives waterborne imports of crude oil in addition to the 76 kbpd it receives indirectly from the Enbridge system. Valero Quebec City is not directly connected to the Enbridge system; rather it receives crude oil via tankers that are loaded from the Enbridge pipeline at Montreal and then sailed 155 miles up the St. Lawrence River to its refinery near Quebec City.[87] Suncor Montreal is connected to the Portland Pipeline that originates at a crude oil waterborne terminal, which is detailed below. Suncor Montreal currently receives 125 kbpd from the Enbridge system and also has capability to receive waterborne crude directly. Valero Quebec City and Suncor Montreal total a combined 201 kbpd of existing pipeline-supplied demand that could be replaced by waterborne imports. Were this 201 kbpd of existing Quebec volume to be displaced by waterborne imports and made available for consumption in the Sarnia area, the resulting total

[81] https://www.enbridge.com/~/media/Enb/Documents/Factsheets/FS_EnergyInfrastructureAssets.pdf?la=en
[82] ESAI Energy, LLC, *Report for the Bad River Band of the Lake Superior Tribe of the Chippewa Indians on The Impact of the Shutdown of Enbridge Line 5 on the Flow of Crude Oil to Refiners*
[83] Muse Stancil, *Expert Report of Neil K. Earnest*
[84] Detroit received 82 kbpd in 2021 ex-Line 78/5 (vs. 80 kbpd from Line 79 in this scenario) and Toledo received 166 kbpd in 2021 ex-Line 78/5 (vs. 100 kbpd from Line 17 in this scenario)
[85] After filling Line 17 and Line 79, Line 78A would still be able to deliver 589.7 kbpd to Line 78B but Line 78B would only be able to receive 525 kbpd
[86] 2021 ex-Line 78/5 of 861 kbpd – 705 kbpd supplied by expanded Line 78 = 156 kbpd
[87] https://rbnenergy.com/take-a-pipe-on-the-east-side-feeding-crude-to-quebec-refineries

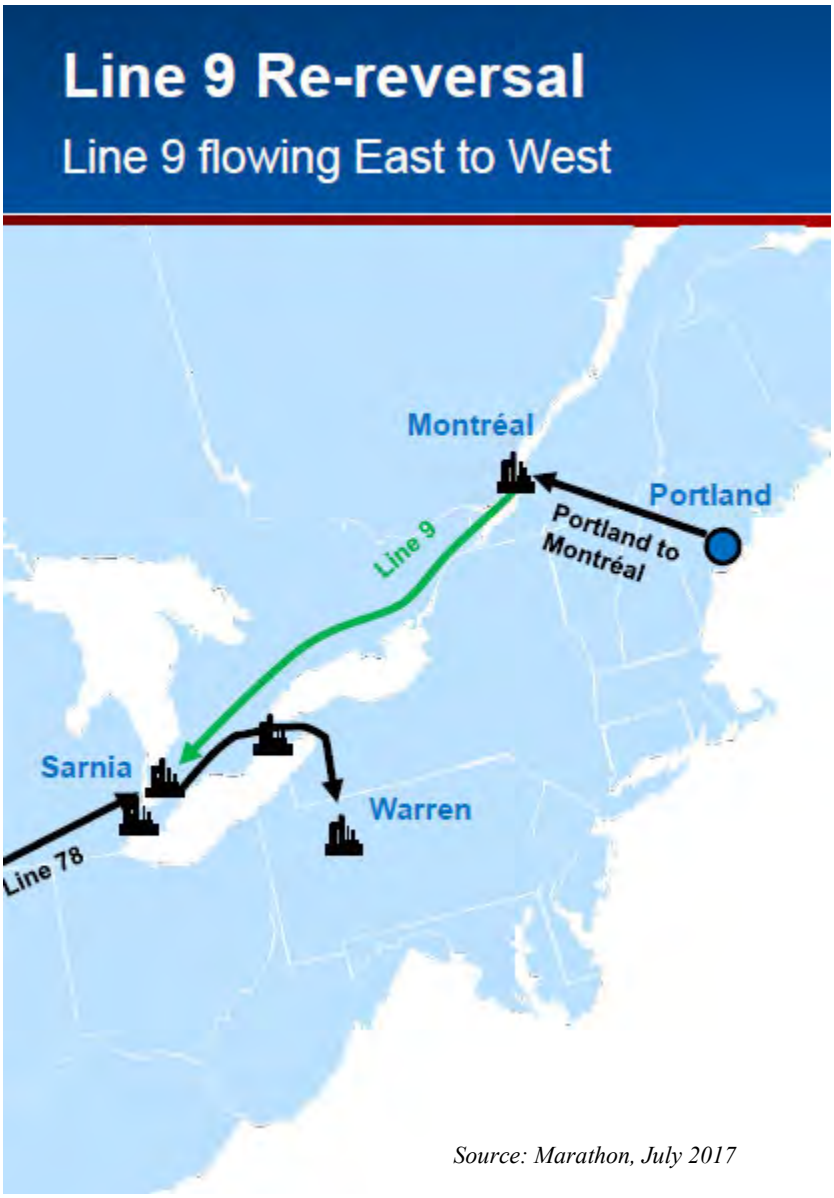
shortfall for Line 5 crude volumes in the event of a shutdown would be just 90 kbpd.[88] This waterborne imports displacement strategy combined with a Line 78 expansion would create a new supply level larger than the total shortfall that the Rennicke and Earnest Reports predict from a Line 5 closure.

Line 9 Re-Reversal

A Line 9 re-reversal is another pipeline related solution that would increase pipeline crude flows to Sarnia, ON and would not involve a new pipeline. As detailed earlier, Line 9 has already been reversed twice and currently flows from Sarnia, Onatrio to Montreal with a capacity of 300 kbpd. A Line 9 re-reversal would add 300 kbpd of crude oil pipeline capacity into Sarnia, ON.[89] 300 kbpd of increased crude oil capacity is larger than the total shortfall that the Rennicke and Earnest Reports predict from a Line 5 closure. With a Line 9 re-reversal, both Suncor Montreal and Valero Quebec City would lose access to crude oil from the Enbridge system, but as discussed in the preceding section both refineries have access to waterborne imports (direct from vessel or via the Portland to Montreal pipeline). In 2017, Marathon (which owns the Detroit refinery that is fed in part by Line 5) did a report on the impact of a Line 5 shutdown entitled, *Enbridge Line 5 Study – Impact of a Line 5 Shutdown,* in which it discussed alternative scenarios in the event of a Line 5 shutdown. Figure 36 is from this Marathon report and illustrates the Line 9 re-reversal concept as well as the pipeline from Portland to Montreal. The Marathon report also states that there would be minimal capital cost to reverse Line 9.

[88] Shortfall of 291 kbpd (calculated on page 52) – 201 kbpd = 90 kbpd
[89] Marathon Petroleum Company LP, *Enbridge Line 5 Study – Impact of a Line 5 Shutdown*, July 2017

Figure 36



Source: Marathon, July 2017

Potential Alternative Crude Oil Refinery Scenarios in Addition to Line 78 Expansion and Line 9 Re-Reversal (List Not Meant to Be Exhaustive)

Refinery	Potential Source Option(s)	Unloading Details Scenario 1 and Significant Infrastructure Required (if any)	Unloading Details Scenario 2 and Significant Infrastructure Required (if any)
Sarnia - Imperial	Western Canada, Bakken, Superior (from Enbridge system), Zenith-Joliet (from Enbridge system)	Utilize next door existing VIP Rail Sarnia terminal; pipeline connection	
Sarnia - Shell	Western Canada, Bakken, Superior (from Enbridge system)	Utilize next door existing VIP Rail Corunna terminal; additional track on available VIP land and pipeline connection	
Sarnia - Suncor	Western Canada, Bakken, Superior (from Enbridge system)	Rail to a VIP Rail site, then water movement to refinery; VIP is currently building dock infrastructure, additional storage tanks at a VIP Rail site	
Nanticoke - Imperial	Western Canada, Bakken, Superior (from Enbridge system), Zenith-Joliet (from Enbridge system)	Utilize existing 20 kbpd rail unloading capacity; potentially add more track and unloading equipment	
Montreal - Suncor	Eastern Canada, Permian, waterborne crude market, Western Canada, Bakken, Superior (from Enbridge system)	Utilize Portland Pipeline (24.2 kbpd throughput in January 2022) that runs from Portland, ME (where waterborne crude is injected into pipeline) to Suncor Montreal that has a capacity of 223 kbpd[90]	Utilize existing 40 kbpd crude by rail unloading capacity at refinery; Scenario 3: waterborne crude direct to refinery
Quebec - Valero	Eastern Canada, Permian, waterborne crude market, Western Canada, Bakken, Superior (from Enbridge system)	Increase waterborne imports	Utilize existing 60 kbpd crude by rail unloading capacity at refinery
Detroit - Marathon	Western Canada, Bakken, Superior (from Enbridge system)	Utilize existing rail infrastructure at pipeline-connected Marathon Woodhaven NGLs cavern terminal (may impact NGLs business); likely can use tanks at Buckeye Terminals next door	Develop crude by rail offload terminal at nearby Zug Island brownfield site; requires unloading equipment, potentially more track, storage tanks and pipeline connection to refinery
Toledo - PBF	Western Canada, Bakken, Superior (from Enbridge system)	Maximize existing rail facility onsite and truck offloading onsite supplied from nearby rail to truck terminal	
Toledo - BP-Husky	Western Canada, Bakken, Superior (from Enbridge system)	Develop crude by rail unloading capabilities at next door Midwest Terminal's Facility 1 terminal; storage tanks and pipeline connection to refinery	
Warren, PA - United	Western Canada, Bakken, Superior (from Enbridge system)	Maximize limited rail offloading at refinery	Rail deliveries to Hamburg, NY where volumes are transloaded and trucked to West Seneca, NY for injection into Kiantone Pipeline that feeds refinery

[90] https://www.cer-rec.gc.ca/en/data-analysis/facilities-we-regulate/pipeline-profiles/oil-and-liquids/pipeline-profiles-montreal.html

Other Potential Alternative Scenarios - NGLs

Propane and butane have seasonal demand, so large storage is beneficial as it allows stockpiling in the offseason from distant supply sources. This enables a nearby, readily available inventory during the peak season of winter. Fortunately, there are 32,555,000 barrels[91] of underground NGLs storage capacity in Michigan and Sarnia-Windsor, ON as illustrated in Figure 37 below. Note that this is higher than the annual propane and butane production of the three Line 5-related fractionators of 30,550,500 barrels per year (Figure 38). These underground NGLs storage facilities in Sarnia-Windsor and most of the underground NGLs storage facilities in Michigan are pipeline-connected. Pipeline connectivity could allow for rail delivery to one NGLs storage facility followed by a pipeline move to another NGLs storage facility to maximize rail unloading capabilities.

Figure 37

Table 4. Hydrocarbon Gas Liquids Underground Storage Capacity

Ower/Operator	Location	Underground Storage
Plains Midstream	St. Clair, Michigan	84,000,000
DCP Midstream	Marysville, Michigan	336,000,000
Marathon Petroleum	Woodhaven, Michigan	73,710,000
Plains Midstream	Alto, Michigan	54,600,000
Sunoco Logistics	Inkster, Michigan	33,600,000
Michigan Total		**581,910,000**
Plains Midstream	Windsor, Ontario	197,400,000
Plains Midstream	Sarnia, Ontario	243,600,000
Alberta Ltd.	Corunna, Ontario	218,400,000
Suncor Energy Products	Sarnia, Ontario	49,560,000
Imperial Oil	Sarnia, Ontario	76,440,000
Sarnia – Windsor, Ontario Total		**785,400,000**

Source: Upper Peninsula Energy Task Force

Figure 38: 2019 NGLs Production from Line 5 Related Fractionators[92]

	Propane (bpd)	Butane (bpd)	Propane (,000 barrels/yr)	Butane (,000 barrels/yr)
Superior, WI	[redacted]			
Rapid River, MI				
Sarnia, ON				
Total				

Total Propane and Butane (,000 barrels/yr)	[redacted]

[91] 581,910,000 gallons + 785,400,000 gallons = 1,367,310,000 gallons or 32,550,000 barrels

[92] Muse Stancil, *Expert Report of Neil K. Earnest*

Potential Alternative NGLs Market Area Scenarios (List Not Meant to Be Exhaustive)

NGLs Market Area	Source Option(s)	Unloading Details Scenario 1	Unloading Details Scenario 2
Sarnia	Western Canada, Marcellus/Utica, Bakken	• Utilize existing rail infrastructure at NGLs storage caverns in the area including Plains-St. Clair, DCP Midstream-Marysville, and Plains-Sarnia to receive propane and butane. • Utilize significant storage to inject in the offseason and distribute during peak season of winter.	• Maximize existing rail infrastructure at Plains Sarnia fractionator to offload same propane/butane mix its receiving today from Western Canada. • Rail infrastructure at a VIP rail site could be utilized but a pipeline connection to fractionator would likely be required which was not analyzed.
Superior, WI	Western Canada, Marcellus/Utica, Bakken	• Continue to receive propane/butane mix via Enbridge pipeline and distribute propane the same as today. • Distribute butane via truck to St. Paul, MN refineries or add new rail loading infrastructure to distribute butane to further destinations including Sarnia.	• Receive propane via the Enbridge pipeline and distribute the same as today utilizing the fractionator's storage and truck loading. • Propane could also be received by rail at existing nearby Superior Fuels rail terminal.
Michigan Upper Peninsula	Western Canada, Marcellus/Utica, Bakken	• Utilize existing five rail unloading facilities, two of which are being upgraded with help from the Michigan Freight Economic Development Program.[93] • Additional rail facilities could be developed including simple rail direct to truck transloading on yard or industry track.	• Distribute from Kalkaska, MI which has a processing plant and access to the bidirectional Ambassador Pipeline. • Ambassador Pipeline is projected to be pipeline connected to Marysville, MI and its NGLs storage caverns in June 2022[94]
Northern Wisconsin	Western Canada, Marcellus/Utica, Bakken	• In addition to supplies from Superior, WI as detailed above, utilize CHS's Hixton, WI terminal (ability to offload six railcars in four and a half hours) that opened in 2014.[95]	• Utilize Alliance Energy Services' Waupaca, WI Terminal that has rail siding of 51 railcars and 1.75 million gallons of storage that opened in 2017.[96]

[93] https://www.michigan.gov/documents/mdot/Propane_by_Rail_in_Michigans_Upper_Peninsula_745595_7.pdf
[94] NGL Energy Partners LP, *Investor Presentation February 2022*
[95] https://www.progressiverailroading.com/canadian_national/news/CHS-to-build-CN-served-propane-terminal-in-Wisconsin--40661
[96] https://alliancec3.com/terminal-locations/

Appendix A – Case Materials Reviewed

- *Expert Report of William J. Rennicke,* January 21, 2022
- *Expert Report of Neil K. Earnest*, Muse, Stancil & Company, January 31, 2022
- *The Impact of the Shutdown of Enbridge Line 5 on the Flow of Crude Oil to Refiners*, ESAI Energy, LLC, January 31, 2022
- *Enbridge Line 5 Study – Impact of a Line 5 Shutdown*, Marathon Petroleum Company LP, July 2017
- *Enbridge Line 5 Study – Impact of a Line 5 Shutdown*, Marathon Petroleum Company LP, July 2, 2020, revised August 10, 2020
- Court Document: *DEFENDANTS' OBJECTIONS AND RESPONSES TOPLAINTIFFS' FOURTH SET OF NTERROGATORIES,* Case No. 3:19-cv-602, dated: March 24, 2022

Appendix B – Relevant Credentials

PLG Consulting provides consulting and management services in strategy, supply chain, and logistics engineering focused on the industrial economy. Founder and CEO Graham Brisben formed the business in 2001 following a career in the railroad and trucking industries, where his various operations and business development roles helped to identify the market need for objective, expert consulting services for shippers, transportation companies, financial firms, government entities, and other stakeholders in the world of commodity supply chain and logistics. With a team of over 40 industry veteran consultants, PLG serves over 300 clients in the energy, renewables, chemicals, minerals, bulk commodities, private equity, and surface transportation sectors.

The firm's relevant articles, presentations, and speaking engagements include:

- *"Energy & Materials in the Age of Decarbonization: Implications for Rail,"* Rail Equipment Finance Conference, La Quinta, CA, March 2022
- *"Navigating in a Volatile World: Chemicals, Plastics, & Polymers Pricing and Supply Trends,"* AWA Global Release Liner Conference & Exhibition, Chicago, IL, November 2021
- *"Reshaping the Chain: Supply Chain Update,"* Southwest Association of Rail Shippers Annual Meeting, San Antonio, TX, March 2021
- *"Capturing a Decade of Opportunity: Anticipating and Understanding Supply Chain Evolutions,"* Railroad Financial Corporation virtual presentation, March 2021
- *"North American Energy Update: Opportunities and Challenges for Rail in Upstream, Refining, Chemicals and Renewables,"* Rail Equipment Finance Conference, La Quinta, CA, March 2020
- *"Updated: From Upstream to Downstream: Opportunities and Challenges for Rail,"* North American Rail Shippers Association Annual Meeting, San Antonio, TX, May 2019
- *"Crude-by-Rail and Refined Products Transport Infrastructure,"* Bank of America Merrill Lynch 2019 Transportation and Industrials Conference, Boston, MA, May 2019
- *"From Upstream to Downstream: Opportunities and Challenges for Rail,"* Rail Equipment Finance Conference, La Quinta, CA, March 2019
- *"From Drilling to Downstream: Opportunities and Challenges for Rail,"* Rail Equipment Finance Conference, La Quinta, CA March 2018
- *"The Future Has Arrived: Petrochemicals and Energy by Rail,"* Southwest Association of Rail Shippers, San Antonio, TX, February 2018
- *"North American Energy Insights,"* North American Rail Shippers Association annual meeting, San Francisco, CA, May 2017
- *"North American Energy Revolution: Rail Impacts Downshifting to Downstream,"* Rail Equipment Finance Conference, La Quinta, CA, March 2017
- *"The Changing Energy Landscape: Implications for Rail,"* Rail Equipment Finance Conference, La Quinta, CA, March 2016
- *"The Changing Landscape for Energy: Shale Oil & Gas Outlook,"* Southwest Association of Rail Shippers, Dallas, TX, October 2015
- *"The North America Energy Revolution: Implications for Rail,"* The Rail Summit – Supply Chain Conference, Chicago, IL, April 2015

- *"The North America Energy Revolution: Implications for Rail,"* Rail Equipment Finance Conference, La Quinta, CA, March 2015 and Union League Club, Chicago, IL, February 2015
- *"Moving Crude Oil by Rail,"* Transportation Research Board 94th Annual Meeting, Washington, D.C., January 2015
- *"Shale Development: The Evolving Transportation Impacts,"* The Rail Summit, Chicago, IL, June 2014
- *"Shale Development: The Evolving Transportation Impacts,"* Rail Equipment Finance Conference, La Quinta, CA, March 2014
- *"Crude by Rail Report,"* Stifel Capital Markets conference call, December 2013
- *"Crude by Rail Report,"* Rail Trends conference, New York, NY, November 2013
- *"Oil & Natural Gas: The Evolving Freight Transportation Impacts,"* CIT Rail Resources Conference, Jackson Hole, WY, July 2013
- *"Oil & Natural Gas: The Evolving Freight Transportation Impacts,"* GE Capital – Q3 All Employee Meeting, Chicago, IL, July 2013
- *"Oil & Natural Gas: The Evolving Freight Transportation Impacts,"* Midwest Association of Rail Shippers, Lake Geneva, WI, July 2013
- *"Oil & Natural Gas: The Evolving Freight Transportation Impacts,"* FTR State of Freight Summit, Chicago, IL, May 2013
- *"Shale Development in Argentina: The Evolving Supply Chain,"* Frac Supply Chain Summit, Buenos Aires, Argentina, April 2013
- *"Oil & Natural Gas: The Evolving Freight Transportation Impacts,"* Rail Equipment Finance Conference, La Quinta, CA, March 2013
- *"Oil & Natural Gas: The Evolving Freight Transportation Impacts,"* Northwestern University Transportation Center – Business Advisory Committee Meeting, Evanston, IL, October 2012
- *"Mapping the Current Proppants Transportation Infrastructure,"* Proppants Summit, Denver, CO, July 2012