FLOW
FOR LOVE OF WATER

Protecting the Common Waters of the Great Lakes Basin
Through Public Trust Solutions

December 22, 2017

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Director Heidi Grether Michigan Department of Environmental Quality P.O. Box 30458 Lansing, Michigan 48909-7958	Ms. Valerie Brader Executive Director Michigan Agency for Energy P.O. Box 30013 Lansing, Michigan 48909-7958
Director Keith Creagh Michigan Department of Natural Resources Executive Division P.O. Box 30028 Lansing, Michigan 48909	

VIA ELECTRONIC SUBMISSION

RE: PUBLIC COMMENTS ON DYNAMIC RISK *FINAL* ALTERNATIVES ANALYSIS REPORT

Dear Governor Snyder, Attorney General Schuette, Director Grether, Director Creagh, and Executive Director Brader:

On August 4, 2017, For Love of Water ("FLOW") submitted to the State of Michigan our official comment on Dynamic Risk ("DR") Line 5 Draft Alternatives Analysis ("Draft Report") in the hopes that the fundamental problems we identified would be addressed in the Final Report. Unfortunately, DR's Final Report failed to address these material problems, and thus, remains a flawed report not suitable as the basis for decision-making regarding the fate of Line 5.

FLOW reiterates our initial comments and provides additional comments to the State of Michigan regarding its paramount role as public trustee to protect the Great Lakes and their tributary waters from risk of serious harm. Once again, our research and analyses for the past three years demonstrate that unless the State takes immediate action to decommission Line 5 in the Straits and implement available alternative capacities, lines, and modifications of the overall design capacity of the Lakehead system, the State has violated this public trust duty to the citizens of Michigan. It has further failed to implement the Petroleum Pipeline Task Force's recommendation for a full and comprehensive alternative analysis.

In addition to the comments that follow, FLOW submits that the consulting agreement between the State, DR, and Enbridge that gave Enbridge an "in camera" review and comment period on the DR report before it was released constitutes an inherent conflict of interest. Accordingly, FLOW requests full disclosure by

Enbridge and the State of all comments, edits, or changes to the DR report resulting from the Enbridge review, or submitted by Enbridge to DR regarding the Final Report. Governor Snyder, Attorney General Schuette, and DEQ Director Grether have expressed a commitment to transparency in this process, including this report. Enbridge agreed to transparency in its November 25, 2017 agreement with Governor Snyder and the State. We request that you post this information on the DEQ and Pipeline Safety Advisory Board websites immediately, and grant an opportunity for FLOW and other commenters to review and supplement their comments. If this is not done, the DR Final Report is presumed to be unreliable.

I. THE STATE'S PUBLIC TRUST DUTY IS PARAMOUNT AND CONTINUOUS.

The Great Lakes are subject to a public trust, and the State of Michigan has an affirmative duty to act as the legal trustee on behalf of citizens to protect these public trust waters and bottomlands and dependent public uses of navigation, commerce, fishing, swimming, boating, and the ecological environment. This duty is perpetual, continuing, and paramount to other private or public purposes, including the 1953 easement. As a result, independent of the easement with Enbridge, the State can exercise its power and duty to revoke or modify the easement or its uses. Although authority under the 1953 easement grants Enbridge the pipeline right-of-way, the common law public trust doctrine overlies and governs the use of the lake's bottomlands notwithstanding an easement granting private use. As declared by the United States Supreme Court in a landmark Great Lakes public trust case involving Lake Michigan,

> [T]here always remains with the state the right to revoke those powers and exercise them in a more direct manner, and one more conformable to its wishes. So with trusts connected with public property, or property of a special character, like lands under navigable waters; they cannot be placed entirely beyond the direction and control of the state. [1]
>
> Any grant of the kind is necessarily revocable, and the exercise of the trust by which the property was held by the State can be resumed at any time. Undoubtedly there may be expenses incurred in improvements made under such a grant which the State ought to pay; but, be that as it may, the power to resume the trust whenever the State judges best is, we think, incontrovertible.[2]

The "public trust doctrine is alive and well in Michigan."[3] The public's property interest is "a title held in trust for the people of the State that they may enjoy the navigation of the waters, carry in commerce over them, and have liberty of fishing therein freed from the obstruction or interference of private parties."[4] The State, as a sovereign, is the primary trustee of the waters, bottomlands, and related natural resources of Michigan's Great Lakes, which represent 20 percent of the world's fresh surface water.[5] The lakes and their connecting tributary waters are held in perpetual public trust for citizens. The administrator of the trust does not have the power to abdicate its responsibility as trustee in favor of private parties.[6] Moreover, the legislature cannot give away or sell its discretion; Enbridge's easement is subject to termination and revocation.[7]

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[1] *Illinois Central R Rd v Illinois*, 146 US 387, 453-4 (1892); *Obrecht*, 361 Mich. at 415 (adopting *Illinois Central R. R* and upholding the requirements of the Great Lakes Submerged Lands Act, MCL 324.32501 et seq., as consistent with the public trust standards of *Illinois Central*).
[2] *Illinois Central R. Co. 146* U.S. at 455.
[3] *Glass v. Goeckel*, 473 Mich. 667, 681 (Mich. 2005).
[4] *Ill. Central R.R. Co. v. Ill.*, 146 U.S. 387, 452 (1892); *Obrecht v National Gypsum*, 361 Mich. 399 (Mich. 1960); *Glass v Goeckel*, 474 Mich. 667 (Mich. 2005).
[5] *Glass*, 473 Mich. at 683,673.
[6] *Ill. Central R.R. Co.*, 146 U.S. at 453.
[7] *Id.*, 146 U.S. at 460.

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II. PROCEDURAL HISTORY IN DETERMINING THE FATE OF LINE 5 IN MICHIGAN

Enbridge is known in Michigan for its catastrophic Line 6B pipeline rupture in 2010, causing the largest inland oil spill in U.S. history with clean-up costs exceeding $1.2 billion along a 40-mile stretch of the Kalamazoo River. Between 2010 and 2013, Enbridge systematically and strategically expanded Line 6B's (now Line 78) pipeline average capacity from 283,000 barrels per day ("bbl") to 500,000 bbl[8] from Flanagan, IL to Sarnia, Ontario (with ultimate design capacity at 800,000 bbl) *and* increased Line 5's volume over 10 percent from 490,000 bbl to 540,000 bbl. After the Kalamazoo disaster, instead of systematically examining the impacts to Michigan's air, water, and land and requiring Enbridge to evaluate feasible and prudent alternatives, the State of Michigan allowed Enbridge to expand its pipeline operations across the state in piecemeal fashion without the full public scrutiny required under law.

It wasn't until 2014 that State officials initiated steps to address the 64-year old Line 5 in the Straits of Mackinac. Governor Snyder established a task force by executive order to make recommendations on Line 5 and other hazardous liquid pipelines in the state. A year later, the task force released its report with four key Line 5 recommendations to address the unacceptable risk of a release of crude oil in the Straits: ban heavy crude oil, demand additional information from Enbridge, obtain an independent analysis on risk and magnitude of harm, and obtain an independent comprehensive analysis of alternatives that would lead to a removal of this risk to the Great Lakes.

The Task Force recommendations set the wheels in motion for the creation of the Pipeline Safety Advisory Board ("PSAB" or "Advisory Board") under another executive order issued in September 2015 to implement and facilitate these recommendations. This Advisory Board included representatives not only from key state agencies but also from Enbridge and Marathon refineries as well as National Wildlife Federation and Tip of the Mitt.

Over two years later, despite mounting evidence of Enbridge's ongoing serious violations of the easement to occupy our public waters and bottomlands in the Great Lakes, only one of the independent draft reports was available for public comment – the Dynamic Risk draft alternatives analysis – because of a conflict of interest on the part of the hired consultant that forced the State to scrap the risk report.

A closer look reveals that Dynamic Risk's ("DR") final alternative report released on November 20 also raises grave conflict of interest problems on top of significant technical errors and omissions, flawed assumptions, and missing data, which this comment submission will address in detail below. The actions of Enbridge and handling of the reports by the consultants have undermined and jeopardized the objectives of the Task Force, the Pipeline Safety Advisory Board, and State and now endanger the waters, public trust, and protected public uses, health and safety.[9]

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[8] Reuters. *Enbridge plans $1.3 bln Line 6B replacement.* (May 11, 2012). Retrieved from http://www.reuters.com/article/enbridge-idUSL1E8SB36J20120511; MLive *Enbridge Inc. crews replace Line 6B oil pipeline in Mendon; $1.3 billion project end slated for 2014.* (Aug. 13, 2013) Retrieved from http://www.mlive.com/business/west-michigan/index.ssf/2013/08/enbridge_inc_crews_replace_lin.html.

[9] To further complicate matters, on May 23, 2017, the U.S. Environmental Protection Agency ("USEPA") and the Department of Justice ("DOJ") entered into a final Consent Decree to settle Enbridge's case for civil penalties and other relief for CWA violations arising out of the rupture of its Line 6B in 2010. As part of the decree, measures were added to Enbridge's entire Lakehead System, including the following programs for Line 5 on span management program, biota investigation, in-line inspections, investigation and repair of axially-aligned features, pipeline movement investigation, quarterly inspection using acoustic leak detection tool. https://www.epa.gov/sites/production/files/2017-06/documents/enbridgeentered-cd_0.pdf The EPA and DOJ relied

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In early November 2017, the public learned that Enbridge has acted in bad faith and misled both Michigan and federal officials about the condition of Line 5 for over three years. We now know that there are at least 48 bare metal spots and/or coating gaps near the 128 total anchor locations on Line 5 in the Straits of Mackinac.

Then, in a stunning turn of events, just a week after DR's final report was released for public comment, and without knowledge by the Pipeline Safety Advisory Board, which he charged with taking such comment, Governor Snyder announced an agreement with Enbridge on November 27, 2017 to fast track a tunnel alternative under our Great Lakes. While the Governor's closed-door deal with Enbridge attempts to set a time line to indefinitely extend the lifespan of Line 5 by August 15, 2018, Enbridge still has a pending anchor permit proceeding under the Great Lakes Submerged Lands Act that requires the corporation to demonstrate twofold: (1) no substantial likelihood of harm, impairment or pollution to public trust waters and resources; and (2) no feasible and prudent alternatives to locating oil pipelines in the open waters of the Great Lakes.

In sum, the State of Michigan has established a multi-year, multi-phased process that has resulted in disqualifying conflicts of interest for the study consultants, delayed any meaningful decisions to protect the paramount interests of the Great Lakes, and allowed Enbridge to continue to profit from its aging asset that threatens our public water. The Governor's Agreement is an attempt to undermine any façade of public engagement and compliance with public trust law to protect the paramount interests of the Great Lakes.

III. MAJOR SHORTCOMINGS OF THE DYNAMIC RISK FINAL ALTERNATIVES ANALYSIS REPORT

This section highlights major shortcomings, flawed assumptions, and conclusions of Dynamic Risk's Final Report, which currently fails to evaluate realistic alternatives to allowing the continued operation of 64-year-old oil pipelines in the open waters of the Great Lakes.[10]

A. The Final Report Improperly Narrowed the Scope of Work.

The State of Michigan's scope of work for this report is clear: "to provide the State of Michigan and other interested parties with an independent, comprehensive analysis of alternatives to the existing Straits Pipelines, and the extent to which each alternative promotes the public health, safety and welfare and protects the public trust resources of the Great Lakes." In addition, Dynamic Risk's Final Alternatives Analysis Report ("Final Report") should have provided a systematic comparison of the feasibility, costs, benefits and risks of several alternatives, plus an independent, detailed engineering evaluation of the existing pipelines and their safe and reliable operating life. The November 27, 2017 Agreement between Enbridge and the Governor that narrows the alternative review and analysis by resolution of the Governor's PSAB demonstrates strong proof of the arbitrariness of DR's approach and Final Report. The Advisory Board adopted a resolution amending the Governor's Agreement with Enbridge that demands Line 5 be shut down until a full investigation can be conducted on Line 5 in light of significant coating gap and integrity issues. In addition, the Advisory Board demands a new detailed analysis on the public

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on Enbridge's representations that its proposed anchor remedy would help stabilize Line 5 on the lakebed and minimize the risk of pipeline rupture; recent Enbridge disclosures in November, however, reveal that the anchors may have caused coating gaps in potentially 128 locations along the pipeline. Enbridge has not yet conducted visual inspections of potentially 80 coating gaps.

[10] *Id.*

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need for Line 5 in Michigan, a more robust study of alternative pipeline capacity to reroute the portion of Line 5's flow dedicated to Michigan's needs, and a more robust study of options to supply propane and oil to meet Michigan's needs currently met by Line 5 and to transport of oil to market from northern Michigan. Due on June 25, 2018, this report will provide a detailed evaluation of the actual net benefits and costs in terms of environment, jobs, fishing and public trust to address alternatives to meet the needs of the 18 percent of the rural population in UP for propane and alternatives to meet the need to transport light crude from northern LP to Sarnia and southern Michigan; it also urges a comprehensive alternatives analysis of existing and potential modification of design capacity within the larger pipeline system across southern Michigan to Sarnia and Detroit and Toledo. The PSAB's position also supports the expert, technical and legal analysis and opinions submitted by FLOW and other organizations regarding the legal necessity to expand the alternatives analysis.

Despite a 380-page report with hundreds of pages of appendices, DR's Final Report again rejected the two most critical alternatives, leaving the State and the public with only four alternatives to compare and consider: (1) status quo Line 5 remains in the Straits; (2) new pipeline route and rail car; (3) new tunnel, and (4) abandonment of Line 5 in the Straits. This report again dismissed examining Alternative 2's existing pipeline infrastructure, reasoning that they are required to identify Enbridge's undiminished existing Line 5 product flow from Superior, Wisconsin to Sarnia, Ontario. Nowhere in the scope of work is there such a limitation. Rather, Dynamic Risk imposes this product limitation to each remaining analysis except for Alternative 6, which only examines the amount of Line 5 product relied upon by Michigan citizens and businesses. By failing to apply the same product transport numbers across all of the alternatives, the Final Report analysis makes it impossible for the state and public to make an apples-to-apples comparison of these options. Moreover, as a result of Dynamic Risk's arbitrary failure to adequately examine existing pipeline capacity and infrastructure in Alternative 2, the State and the public have been deprived of a thorough examination of whether the existing pipeline infrastructure in, through and out of the Great Lakes region provides a feasible and prudent alternative to Line 5.[11]

The arbitrary rejection of recently increased and adjustable capacity of existing pipeline infrastructure, along with other assumptions, unfairly tilted the report toward constructing a new line in a tunnel in the Straits, which does not avoid the risk of a release and catastrophic harm to Lake Michigan, Lake Huron, and the Straits. In fact, Line 5 traverses over 245 other water crossings, many of which are direct tributaries into the Great Lakes. The significant water, economic, public health, and ecological interests of the state, local communities, the tribes, and their citizens are not served by the continued operation of the Straits Pipelines. In sum, a premature rejection of potentially viable alternatives resulted in a final product preventing government officials and the public from making informed conclusions on the risk of Line 5 to the Straits of Mackinac, impact on the corridors through Michigan and viable alternatives that eliminate the need for Line 5.

B. The Final Report Dismisses the Most Credible Alternative of Existing Pipeline Infrastructure and Provides Insufficient Reasoning for the Exclusion.

The Final Report ignores using existing pipeline infrastructure as an alternative to Line 5 in the Straits, which was one of the alternatives the State contractually required Dynamic Risk to analyze. It is

[11] Fortunately, there is sufficient information for others to conduct the analysis of the "existing alternative pipeline infrastructure" to conclude that with a few adjustments over 12 to 18 months this option is a quite suitable if not preferred. See FLOW Dec. 2015 Alternatives Report, p. 21 http://flowforwater.org/wp-content/uploads/2015/12/FLOW-Composite-Report-12-14-15-FINAL-1.pdf and Section III and Appendix A of *Comments on the Dynamic Risk Report: Draft Final Report – Alternatives Analysis for the Straits Pipeline.* Richard Kane. (August 4, 2017) http://flowforwater.org/wp-content/uploads/2016/04/A-RK-Alt.pdf.

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unacceptable that the contractor eliminated this alternative in the final stages of analysis in violation of the express terms of the state contract and the clear recommendations and standards outlined in the Michigan Petroleum Pipeline Task Force Report. Dynamic Risk's excuse is poor at best, reasoning that the statement of work provided "no provision for mixed alternatives (multi-modal transport or permutations or combinations of multiple lower capacity alternatives)." (Final Report ES-2). Systems can and do adapt, and a multi-modal transport may be critical to a feasible and prudent alternative that protects the Great Lakes.

Dynamic Risk states it made an early decision to remove from its study a comprehensive analysis of transporting Line 5 oil through other existing or modified pipelines, a decision that skewed study results. Back in 2015, FLOW's experts urged the state to conduct a broad system approach or otherwise face compromised and skewed results: "The overall purposes of the crude oil pipeline network in and around the Great Lakes must not be drawn or evaluated too narrowly; in other words, segments of the whole system should not be isolated from the evaluation of the system as a whole."

Instead, the contractor summarily eliminated without good-faith or proper analysis the larger pipeline system around the Great Lakes as a viable alternative, arbitrarily determining that "it was highly probable that either a new build pipeline or alternative transportation such as rail would be required to manage capacity." This is exactly what happens as systems adjust and adapt. As indicated above, the Final Report does not even consider the fact that Enbridge's Line 6B's design capacity was doubled after Enbridge's massive 2010 oil spill, or that new replacement lines were being constructed that could be modified or adjusted to accommodate crude oil transport without Line 5 or the risk to the Great Lakes and meet the needs of Michigan, Canada, and Enbridge.

In December 2015, expert advisors to FLOW analyzed and documented the practicality of this alternative for Michigan's energy needs,[12] and FLOW comments and these experts' reports have been part of the public record of the State, including the Pipeline Safety Advisory Board, Attorney General's Office, and MDEQ. In this expert report titled "*Eliminating the Line 5 Oil Pipelines' Unacceptable Risk to the Great Lakes through a Comprehensive Alternatives Analysis and Systems Approach*,"[13] FLOW came to this conclusion:

> All alternative options must be considered. A comprehensive and full range of options is needed to comply with the Michigan Petroleum Pipeline Task Force recommendations and the Governor's Executive Order establishing the Michigan Pipeline Safety Advisory Board. Alternatives explored must not be limited solely to options for transporting liquid petroleum currently carried by Line 5 in the Straits. A comprehensive alternatives analysis should review the transport of crude oil through the lens of the entire Great Lakes region's system of oil pipelines, routes, capacity and ability to deliver liquid petroleum currently carried by Line 5 in the Straits. Without a comprehensive pipeline systems view, state and federal decision-makers are unable to identify and evaluate the best alternative to Enbridge's Line 5 twin pipelines in the Straits of Mackinac.

Thus, it is fundamental that a system-wide approach is required to an essentially system-wide expansion by Enbridge of crude oil transport through the Great Lakes region and Michigan. Finally, Dynamic Risk's Final Report fails to advance the legal obligations of the MPSC and DEQ that require comprehensive impact and alternatives assessments.

[12] *See* http://flowforwater.org/wp-content/uploads/2015/12/FLOW-Composite-Report-12-14-15-FINAL-1.pdf
[13] http://flowforwater.org/wp-content/uploads/2015/12/FLOW-Composite-Report-12-14-15-FINAL-1.pdf

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C. The Final Report Erroneously Assumes that the State of Michigan Must Guarantee that Enbridge Is Able to Deliver 540,000 barrels or 23 Million Gallons of Oil Daily through Line 5.

Dynamic Risk assumes in its Final Report that it is charged with the goal of finding an alternative that guarantees Enbridge the transport of the 540,000 bbl of crude oil or other petroleum liquids (if at full capacity), in addition to the volumes transported through other pipeline infrastructure and/or new infrastructure. DR also assumed that the condition of Line 5 upstream and downstream from the Straits is acceptable for continued operation. As a matter of law and fact, however, this is not correct. The charge to Dynamic Risk by the Petroleum Pipeline Task Force report, the Pipeline Safety Advisory Board and Michigan law is to determine if there is an alternative that first protects the paramount interests and uses protected by the public trust doctrine in the Great Lakes[14] and the declared "paramount public concern" in water, natural resources and public trust under the Michigan Constitution and law.[15]

In the 1953 easement agreement between Enbridge (predecessor Lake Pipe Line Company) and the State of Michigan to occupy our public waters, the State did not covenant to keep oil pipelines operating. In fact, as noted elsewhere, it is the other way around. The easement is subject to the overriding public trust and public value of the Great Lakes, and Enbridge covenants to exercise the prudence of an ordinary person at all times. The State, as indicated by Michigan Public Service Commission ("MPSC") records, originally authorized the pipelines in the Straits for 120,000 bbl with the option to increase the flow rate to 300,000 bbl through the addition of four pump stations.[16] Decades later, Enbridge unilaterally increased the flow rate to 490,000 bbl. In 2013, Enbridge invested $100 million from its $2.6 billion dollar expansion of its Lakehead system to increase operating capacity to 540,000 bbl by adding new pump stations and anti-friction injection facilities that were not authorized by the MPSC in 1953—an expansion of 80 percent of the original design capacity.[17] Despite a manifold increase from original volume or capacity and expanded use of Line 5, Enbridge applications to the MPSC have beguilingly characterized the additional approval of pump stations and other equipment as merely "maintenance," "rehabilitation," or for "integrity," and divided these applications into several segments.[18]

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[14] FLOW Dec. 2015 Alternatives Report, p. 7-8 http://flowforwater.org/wp-content/uploads/2015/12/FLOW-Composite-Report-12-14-15-FINAL-1.pdf

[15] Mich Const. 1963, art. 4, sec. 52; Michigan Environmental Protection Act, Part 17, N REPA, MCL 324.1701 et seq; MEPA is deemed the legislative response to the constitutional mandate to protect water and the environment from harm under art. 4, sec. 52.; *Ray v Mason Co Drain Comm'r*, 393 Mich 294; 224 NW2d 883 (1975); *State Hwy Comm'n v Vanderkloot*, 392 Mich 159; 220 NW2d 416 (1974).

[16] *See* Michigan Public Service Commission, Opinion and Order, In the matter of the Application of Lakehead Pipe Line Company for approval of construction and operation of a common carrier oil pipeline (Case D-3903-53.1, March 31, 1953) p. 6, March 31, 1953. http://www.michigan.gov/documents/deq/Appendix_A.3_493982_7.pdf

[17] FLOW Report: A Scientific and Legal Policy Report on the Transport of Oil in the Great Lakes: (1) Recommended Immediate Actions on the Transport of Oil Through Line 5 Under the Straits of Mackinac; and (2) Supplemental Comments on the Michigan Petroleum Pipeline Task Force, Sept. 21, 2015. http://flowforwater.org/wp-content/uploads/2015/09/FINAL-FLOW-9-21-15-REPORT-ON-ACTION-PLAN-AND-COMMENTS.pdf

[18] FLOW Public Comments on Enbridge's Joint Application to Occupy Bottomlands of the Great Lakes, p. 12-13 (June 29, 2017) http://flowforwater.org/wp-content/uploads/2017/06/FINAL-2017-06-29-17-Comments-to-DEQ-USCOE-Joint-App-Enbridge-for-Supports.pdf ; Enbridge undisputedly has narrowed the scope of review of impacts and reasonable or suitable alternatives to the massive expansion of crude oil through Michigan by dividing the new pipeline and equipment and new facilities for 6B into separate applications and segments. E.g., see Line 6B

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In the past few years, Enbridge has implemented its purpose to greatly expand its crude oil transport system to 800,000 bbl from Alberta and North Dakota through its Lakehead System[19] in the Great Lakes and Midwest regions of the U.S. Numerous press releases, news reports, articles, and Enbridge applications to MPSC, and other agencies, and MPSC records, findings, and decisions show a massive expansion through a multibillion-dollar investment to increase capacity through changes to its pipeline infrastructure.[20] For example, after their Line 6B disaster in 2010, Enbridge filed a number of applications to the MPSC to add a new replacement Line 6B parallel to the failed line based on a misleading stated purpose of "preventive maintenance." In fact, the new Line 6B (now Line 78) has doubled the ultimate design capacity for transport of light and heavy crude up to 800,000 bbl, with a few relatively simple adjustments,[21] making Line 5 inessential.[22]

To date, the MPSC has never considered or determined the cumulative environmental impacts and feasible and prudent alternatives of the entire pipeline system as part of the massive expansion in either Line 5 or Line 6B. Some documents note that Line 6B has operated under a reduced capacity of 240,000 bbl to maintain lower pressure to minimize the risk of a release of the aging old Line 6B that ruptured,[23] So the expanded 800,000 bbl ultimate design capacity is more than three-fold. It should be noted that Line 6B's last Segments 6 and 7, from Stockbridge to Sarnia, have a current capacity of 500,000 bbl, because Enbridge obtained approval for another

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Segmentation Map and "maintenance" applications for several anti-friction stations to increase volume flow rate in Line 5.

[19] "Enbridge's Lakehead Pipeline System ("Lakehead System") includes a network of pipelines that are grouped within rights-of-way that collectively span 1,900 miles from the international border near Neche, North Dakota to delivery points in the Midwest, New York, and Ontario. The products transported by these pipelines allegedly include natural gas liquids and a variety of light and heavy crude oils." The Lakehead System is the part of Enbridge's larger Mainline System with more than 3,000 miles of pipeline corridors in the United States and Canada and is the single largest conduit of liquid petroleum into the United States, delivering on average 1.7 million barrels of oil in to the U.S. each day-a figure that accounts for 23% of the U.S. crude oil imports. *See USEPA v Enbridge Energy LP*, Civil Action No. 1:16-cv-914, Consent Decree, (May 23, 2017), p 4. https://www.epa.gov/sites/production/files/2017-05/documents/enbridge_entered_consent_decree_may_2017.pdf

[20] *See the following documents, which are hereby incorporated by reference:* Enbridge Energy Partners Announces Major Expansions of Its Lakehead System (May 15, 2012) http://www.marketwired.com/press-release/enbridge-energy-partners-announces-major-expansions- of-its-lakehead-system-nyse-eep-1658358.htm; Application for Enbridge Energy 2012 for Amendment to the Aug. 3, 2009 Presidential Permit for Line 67 to Increase Operational Capacity of Pipeline Facilities http://www.state.gov/e/enr/applicant/applicants/202433.htm; In re Enbridge Energy, Limited Partnership Application Case No. U-17020, Pre-Filed Direct Testimony of Mark Sitek And Exhibits, pp. 6-7, 12, 20-21, 25 https://efile.mpsc.state.mi.us/efile/docs/17020/0010.pdf; MPSC Approves Enbridge Energy Crude Oil and Petroleum Pipeline Running Through 10Michigan Counties (Jan. 31, 2013) http://www.michigan.gov/mpsc/0,4639,7-159-16400_17280-294097--,00.html; MPSC Approves Enbridge Energy Limited Partnership Request to Construct Part of Line 6B Pipeline Along Alternative Route in Marysville (Sept. 24, 2013) http://www.michigan.gov/mpsc/0,4639,7-159-16400_17280-313062--,00.html

[21] For example, Dynamic Risk arbitrarily cuts off its consideration of the "existing alternative pipeline infrastructure" alternative, because the doubled 880,000 bbl for Line 6B (Line 78) ends at Stockbridge, where 340,000 bbl are diverted on new and upgraded lines to Detroit and Toledo, and the remaining 540,000 bbl continuing to Sarnia. In fact, Line 6b from Stockbridge to Sarnia could have been or could easily be adjusted in combination with other simple changes in the system to handle light crude now carried by Line 5.

[22] In re Enbridge Energy, Limited Partnership Application Case No. U-17020, Pre-Filed Direct Testimony of Mark Sitek and Exhibits, p 25. https://efile.mpsc.state.mi.us/efile/docs/17020/0010.pdf.

[23] See Enbridge's Keystone-Like Expansion, pipeline and capacity chart, http://insideclimatenews.org/map-another-major-tar-sands-pipeline-seeking-us-permit, and accompanying text.

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segment to increase capacity through a southern branch to Toledo and Detroit refineries.

As a result of these faulty assumptions, DR ignored the following critical issues necessary to properly evaluate the decommission alternative:

- A scenario with a planned decommissioning date should have been analyzed. No time was provided for the system to adapt given notice that Line 5 would be decommissioned in 18 to 24 months.
- No economic and optimization analysis of shipments or capacity shortfalls was conducted given a Line 5 decommissioning date assuming that Canadian crude oil exports transiting Michigan would be largely affected and not supplies vital to Michigan and Northern US and Canada refineries.
- DR failed to forecast and consider new projects from other pipeline companies to move crude oil and NGLs from Ohio, West Virginia and Pennsylvania to Michigan and Canada replacing materials from the West.
- Line 5 is an enabler for Canadian crude oil exports from eastern Canada and planned projects to export from Portland, Maine. The Final Report does not include an analysis of the most likely alternatives where Line 5 decommissioning would be adequately covered by pipeline projects underway and on-hold pending a decision to transport Canadian crude oil to the Gulf Coast and West Coast.
- Line 5 outside of the Straits was constructed with much lower standards and has leaked and ruptured at least 29 times since 1968 according to FOIA records obtained by the National Wildlife Federation. Line 5 is being patched and repaired along the other 640 miles in Michigan. Line 5 is much older than Line 3, 1953 compared to 1960. Enbridge is pursuing a major Line 3 replacement project given its age and increased maintenance and repair costs. A reasonable assumption is that similar replacement/expansion projects would be pursued by Enbridge if an alternative were approved that allows continued operation across the Straits. This scenario at a minimum would maintain current Great Lakes risk levels and be a major disruption to the citizens and tribes of Michigan.

D. The Final Report Fails to Provide a Credible Worst-Case Scenario Spill and Cost Analysis and Grossly Underestimates the Impact on Michigan of a Line 5 Spill.

Despite clear contractual expectations, the Final Report explicitly admits that it does not provide a worst-case scenario spill and cost analysis, which was one of the main objectives of this report and was specifically required by the State in its request for proposals under Section II-B. DR Draft Report in section 2.4.2.2.1.1 (or page 2-72) entitled Study Limitations, states, "The objective of the study has been to establish realistic consequences of possible oil spill scenarios, and does ***not*** represent worst case scenarios."

Section II-B of the Scope of Work for DR clearly states that the analysis shall consider, for each alternative, the worst-case spill or release scenario consistent with the approach described in Part II-A of the Request for Information and Proposals for an Independent Risk Analysis for the Straits Pipelines issued by the State.

> "This would include identifying the "worst case discharge" consistent, at a minimum, with the definition of that term in 40 CFR 194.5 as "the largest foreseeable discharge of oil, including a discharge from fire or explosion, in adverse weather conditions." The identification of the "worst case" should also consider, *consistent with best practices in high-hazard industries, the maximum*

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potential release, before applying engineering and procedural controls intended to minimize releases. The identification of the 'worst case' should also consider *the most adverse foreseeable weather conditions* including, but not limited to, storms and/or ice cover. The analysis would include, but not be limited to, consideration of the following:

(1) the design and placement of the existing pipelines, control systems, leak detection methods, and shut-off valves to determine the various types of physical or operational failures or other potential hazards that could result in releases of oil or other products, including both sudden releases and longer-term releases that could be undetected using the existing systems ;
(2) the types of products being transported and the maximum design flow rate;
(3) the potential failure of release detection methods, control systems, or shut-off valves to operate as intended;
(4) the quantity of the oil or other products that could be released at the maximum design flow rate before the flow was cut off; and
(5) the quantity and fate of oil or other products remaining in the affected pipeline(s) at the maximum design flow rate after the flow is cut off."

Dynamic Risk admits it did not conduct a "worst-case scenario" when it considered risks and probabilities of threats and degree of harm for purposes of its alternative analysis. As a result, the risks and probabilities are not reliable or credible.[24] Moreover, the Dynamic Risk approach ignores standard methodology for risk assessment of hazardous liquids and materials used in the industry, under the Clean Water Act for offshore facilities, and industry experts and professionals.[25] How is risk evaluated? What is the relationship between risk, magnitude of harm or consequences, and probabilities? For Dynamic Risk's alternative analysis to be credible and reliable, it must start with the basic formula that Risk equals Consequence (degree of harm) multiplied by Probability.[26] Where magnitude of harm is high, as with the Great Lakes, probability is correspondingly lower and risk can be high. Where risk is high, standard protocols require the avoidance of the risk or high degree or magnitude of harm if an alternative exists. If this approach and a reliable "worst-case scenario" are not followed, the potential for events that could result far greater harm to the Great Lakes are discounted or ignored.

Under statutory, regulatory, and common law, a risk to the Great Lakes must be entirely avoided or eliminated in circumstances where the harm is so high (e.g., Great Lakes oil spill) even if the probability of the event occurring is relatively low.[27] Because the Great Lakes and public trust are so highly valued under law and the Michigan Constitution, such risks become unacceptable and demand implementation of alternatives that eliminate the risk of the high degree of harm as a priority over other considerations that are considered significant.

Dynamic Risk's reliance on both active and passive control systems to reduce the potential magnitude of a spill violates the scope of work called for by its contract with the State. Sole reliance on this approach or PHMSA 49 CFR 194.105 was not proper for a worst-case analysis. It is a risk reduction strategy to lower

[24] According to the Final Report, an oil spill would cost $147 to $310 million when Enbridge's cleanup costs of its Kalamazoo River Line 6B pipeline oil spill in 2010 cost more than $1.2 billion (Final Report ES-25-26).
[25] FLOW Dec. 2015 Alternatives Report, p.8-9 http://flowforwater.org/wp-content/uploads/2015/12/FLOW-Composite-Report-12-14-15-FINAL-1.pdf
[26] See Appendix B of *Comments on the Dynamic Risk Report: Defining A Worst-Case Release Scenario for the Enbridge Crude Oil Pipelines Crossing the Straits of Mackinac*. Richard Kane. (August 4, 2017). http://flowforwater.org/wp-content/uploads/2016/04/B-RK-Risk.pdf
[27] FLOW Dec. 2015 Alternatives Report, p.8-9 http://flowforwater.org/wp-content/uploads/2015/12/FLOW-Composite-Report-12-14-15-FINAL-1.pdf

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risk to an "acceptable level." The approach defined by PHMSA does not follow the hazardous industry approach for a worst-case scenario ("WCS"), but it is consistent with an alternate release scenario ("ARS") for emergency response planning. Unfortunately, government officials, first responders and the general public often assume that the PHMSA definition identifies the WCS; it does not. ARS release scenarios that include valves, alarms, supervisory control and data acquisition ("SCADA") systems that act to reduce release quantities are "active protective control measures" and the scenarios developed are called Alternate Release Scenarios ("ARS"). Release quantities from an ARS are less than a WCS. Moreover, Dynamic Risk's report actually fell short of 49 CFR 194.105 by subjectively selecting ideal or optimal results for active control measures, rather than a realistic range based on history of Enbridge or the industry with other spills and releases.

By contrast, other federal regulations under the EPA and DHS define WCS using good risk management practices that only take credit for passive protection controls such as fixed secondary containment but not active controls such as block valves etc. because they may not work.[28] Accordingly, the State of Michigan should insist on EPA, DHS, and hazardous risk management methodologies for the "worst-case scenario" to determine risk, including maximum potential release, adverse extreme weather conditions (e.g., ice, storms, seiches, etc.), and other requirement based on hazardous risk management industry's best practices. In addition, because "worst-case" risk analysis requires potential or foreseeable severe weather events, the effect of climate change on the frequency and magnitude of these events must be included.[29]

The magnitude of the risk of a spill is vastly understated, particularly in light of the independent study conducted by the University of Michigan, which concluded that the Straits of Mackinac are the "worst possible place" for a Great Lakes oil spill, with 720 miles of shoreline vulnerable along Lake Michigan and Lake Huron.

The need for a proper "worst-case scenario" risk assessment is also essential due to the cancellation of the DNV draft risk report because of a conflict of interest between it and Enbridge. To help fill the void left by this cancellation, FLOW experts have researched and submitted two credible worst-case reports "*Defining a Worst-Case Release Scenario for the Enbridge Crude Oil Pipelines Crossing the Straits of Mackinac – Line 5*" and "*The Worst-Case Scenario for a Rupture of Enbridge Line 5 at the Straits of Mackinac*."[30] This technical report examines two foreseeable potential major catastrophic rupture of both lines by anchor strike and a slow undetected leak. The first worst-case scenario involving an anchor strike that removes both 20" lines under the Straits (a distinct probability) concludes there would be a release of 60,000 barrels or 2.5 million gallons of crude oil[31] in comparison to the 24,000 barrels released into the Talmadge Creek tributary to the Kalamazoo River (Enbridge's Line 6B Marshall spill). The slow 20-day undetected leak scenario concludes that it could exceed the size of a catastrophic failure, releasing as much as 24,000 bbl per week.

[28] See FLOW Dec. 2015 Alternatives Report, p. 9 http://flowforwater.org/wp-content/uploads/2015/12/FLOW-Composite-Report-12-14-15-FINAL-1.pdf
[29] *Id.* at 6.
[30] See Appendix B of *Comments on the Dynamic Risk Report: Defining A Worst-Case Release Scenario for the Enbridge Crude Oil Pipelines Crossing the Straits of Mackinac.* Richard Kane. (August 4, 2017). http://flowforwater.org/wp-content/uploads/2016/04/B-RK-Risk.pdf and Appendix C of *Comments on the Dynamic Risk Report: The Worst-Case Scenario for a Rupture of Enbridge Line 5 at the Straits of Mackinac.* Gary Street, P.E. (August 4, 2017) http:/flowforwater.org/wp-content/uploads/2016/04/C-GS-WCS.pdf
[31] A single rupture from anchor drag would release approximately 30,000 barrels (1.25 million gallons).

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E. The Final Report Unlawfully Skews the Alternatives Analysis Toward the Tunnel or Replacement Alternative in the Straits (Alternative 4b).

Dynamic Risk's Final Report continues to show an unfair bias towards building a tunneled pipeline in the Mackinac Straits. It fails to consider the risk of a spill to the Great Lakes, rivers and streams from other portions of the 64-year-old pipeline if the Straits portion were rebuilt. Dynamic Risk prefers new pipelines, which was evident when the firm aggressively promoted building a tunnel in its proposal to do this report, and its analysis is deeply flawed. Critically, as more fully described in section III, B., above, and F. below, the Final Report arbitrarily chops off the most feasible, prudent and viable alternative to any transport of crude oil in the Straits and Great Lakes. The Great Lakes are paramount to any other interest that may compete with it.[32] A bias toward the tunnel replacement line subordinates this paramount interest.

The report estimates a much lower cost for a tunnel than other estimates for this type of infrastructure. Dynamic Risk's Final Report estimates the price tag of constructing a tunnel under the Straits at $153 million cost. (3-16). Even Enbridge acknowledges that the Draft "Report's analysis of the trenching and tunneling alternatives, appears to significantly understate the technical difficulties and likely costs of such a project."[33]

This $2,825,294 report surely should offer credible and realistic estimates. Dynamic Risk, however, cannot support its estimate that constructing a tunnel would cost $50 million less than decommissioning the existing Line 5 pipeline. In fact, it would be far more costly than decommissioning Line 5, and in any event because the primary purpose of the alternatives analysis is to protect the paramount public trust in the Great Lakes, differences in cost are not a basis to reject an alternative unless it is shown to be infeasible or imprudent.[34]

The Final Report concludes the project would disrupt northern Michigan's tourism economy for 27 months during a massive construction phase with heavy impacts on Mackinac, Cheboygan and Emmet counties. (Final Report at 3-17). It describes more than two years of semi-trucks hauling massive amounts of rock and soil creating traffic congestion, noise and air pollution and straining public services (policing, medical) that "beyond their limits." (Final Report at 3-19). Moreover, the study notes that construction crews would compete for short-term rental housing with seasonal tourism employees. That would likely raise housing costs as well as availability, negatively impacting motels, restaurants and other tourist-oriented businesses.

The Final Report makes no mention that underground oil pipelines still rupture and that a tunnel would still leave the Great Lakes vulnerable to oil spills, including other portions of Line 5 along the Lake Michigan and its tributaries. According to the U.S. Coast Guard ("USCG"), the segment of Line 5 that could represent the biggest threat to the Great Lakes is a 90-mile stretch along US Route 2 from Manistique to St. Ignace. Along this 90-mile stretch, Line 5 is a single 30-inch line located in places within a half-mile of Lake Michigan, crossing under at least 20 rivers and creeks that feed into the big lake. It is a six-hour drive from Manistique to Detroit where Enbridge's contracted oil spill response team,

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[32] See public trust law, Sec. I; Mich Const. art. 4, sec. 52.

[33] Enbridge Comments on Dynamic Risk Assessment Systems, Inc. Draft Report: Alternative Analysis for the Straits Pipeline, August 4, 2017, at 2. *Available at:* https://www.enbridge.com/~/media/Enb/Documents/Projects/line5/Enbridge%20Comments%20to%20Draft%20Dynamic%20Risk%20Alternative%20Analysis%20for%20the%20Straits%20Pipeline%204%20Aug%2017.pdf?la=en

[34] *Wayne County Health Dept. v Olsonite*, 79 Mich. App. 668 (1977).

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Marine Pollution Control, is located in the event additional response equipment is needed.[35] In short, any tunnel option in the Straits (tunneled, installed below the lakebed using horizontal directional drilling, or trenched in secondary containment) will not eliminate the unacceptable risk to the public trust waters of the Great Lakes..

Most importantly, the Final Report fails to address the infeasibility of obtaining a new conveyance or occupancy agreement and other permits under the Great Lakes Submerged Lands Act[36] and the directional drilling ban.[37] The Attorney General has declared no new crude oil pipelines will be authorized in the Great Lakes. The GLSLA already expressly prohibits oil and gas wells, drilling, and associated pipelines in or under the Great Lakes.[38] When Michigan took title to the bottomlands and waters in trust on admission to statehood in 1837, it took "absolute" title in trust of these lands and waters.[39] A tunnel cannot be authorized without complying with the paramount public trust and the GLSLA standards, and it cannot be approved unless it is shown there will be no impairment or substantial interference and no feasible and prudent alternative consistent with the state's paramount concern for public health, safety, and its air, water, and natural resources.[40]

F. The Final Report Disguises the Fact that Line 5 Is Not Essential to Michigan's Overall Economy

Line 5 is not essential to Michigan's overall energy needs. Michigan consumers and businesses rely on only five to 10 percent of the crude oil and natural gas liquids transported by Line 5 because the majority is destined for Canada or export out the East Coast. The Final Report substantiates this fact: "The majority of Line 5 throughput is delivered to the Sarnia, Ontario terminal in Canada where it is then transported to refineries across eastern Canada and the U.S." (Final Report at 4-4). The Final Report contained facts establishing that decommissioning is possible because feasible and cost-effective alternative exist to meet the energy and infrastructure needs of Michigan. The Final Report also made these factual findings, concluding that without Line 5, Upper Peninsula propane and Lower Peninsula oil transport needs could be met by truck transport; and that alternative sources of oil exist for Michigan refineries. Significantly, such alternatives would not burden Michigan consumers or businesses beyond existing seasonable cost fluctuations. (Final Report at 4-6-4-25).

G. The Final Report Overestimates Decommissioning Line 5's Impact on U.P. Propane Supply.

The analysis of the transportation of propane in the U.P. and Michigan-produced crude oil in the Lower Peninsula is completely inadequate and does not provide reasonable information for government officials and citizens to make informed decisions. In fact, the current system is oversized to handle the much lower quantities if the Line 5 Straits crossing flow stopped. The feasible alternative is to consider combinations of transportation options. However, DR rejected this realistic combination of alternatives, thereby leaving decision-makers without feasible alternative information.

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[35] Keith Matheny, "Great Lakes face threat from Enbridge Line 5," Oct. 3, 2015 http://www.freep.com/story/news/local/michigan/2015/10/06/great-lakes-face-threat-another-enbridge-line/73170338/

[36] MCL 324.32501 et seq. and its Rules.R 322.1001 et seq.

[37] See Mich. Comp. Laws §§ 324.33938, 324.32503.

[38] MCL 324.32503(2).

[39] *Wilcox v Jackson*, 13 Pet. 498, 10 L Ed 264 (1839); *Pollard's Lessee v Hagan*, 3 How. 212, 11 L. Ed. 565 (1846); McMorran Milling Co., 201 Mich 301 (1918*); State v Venice of America Land Co*., 160 Mich 680 (1910).

[40] GLSLA Rule 1015, R 322.1015; MEPA, MCL 324.1705.

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What we know from the Final Report is that data provided by Enbridge says more than 95% of liquefied natural gas transported in Line 5 goes to Sarnia, Ontario. Less than 5% stays in Rapid River in the Upper Peninsula for processing into propane. Yet the flawed Final Report concludes that up to 35 railcars per week or 15 truckloads per day would be necessary to transport propane in the Upper Peninsula. Independent experts advising FLOW, however, found it would take only one railcar or 3 - 4 truckloads per day to replace Line 5 propane supply to the U.P.[41] Most significantly, the Final Report admits that that it would only take installation of a 4-inch pipeline to continue supplying liquefied natural gas ("NGLs") to the Rapid River processing facility.

H. The Final Report Continues to Underestimates the Probability of Pipeline Failure by Ignoring 50 Years of Structural Stress, Currents, and Gravitational Forces.

The Final Report ignores mounting evidence from Enbridge of Line 5 pipeline stresses, deformations, erosion, and bending from extreme currents and gravity in its risk modeling over the past 64 years moving on the lakebed floor of the Great Lakes. The Final Report boldly asserts, "An evaluation of the above inspection data indicates that there is ***no evidence*** that historical spans have degraded the integrity of either the East or West crossing." (Final Report at ES-13)

Over the pipeline's 64-year history, strong currents in the Straits of Mackinac have scoured the lake bottom underneath Line 5. According to public documents, Enbridge allowed multiple unsupported spans to develop during the first 50 years of Line 5's operation, raising the risk of pipeline failure from bending stress and fatigue. Reports filed with the EPA's Consent Decree reference a Kiefner & Associates 2016 report that identified a 2003 survey of 16 unsupported spans greater than 140 feet; the longest at 224 feet on the east leg and 286 feet on the west leg. The most recent evidence shows that Line 5 is bent and deformed where Enbridge is currently requesting permission to anchor it to the lakebed.

Enbridge's efforts to maintain pipeline supports were especially deficient during the 23-year period beginning in 1980 and ending in 2003. Enbridge documents that surfaced this year confirm that the company only got serious about fixing erosion under Line 5 in 2001 after allowing many unsupported spans greater than 75-feet to go unchecked for decades. Yet Dynamic Risk failed to factor into its risk analysis the impact of 50 years of unsupported pipeline spans**.**

I. The Final Report Fails to Examine the Causes and Impacts of Pipeline Damage on Line 5 Despite Documented Evidence of Pipeline Damage.

The Final Report fails to analyze new evidence disclosed by Enbridge affecting the pipeline's integrity, including external corrosion, bends, 48 bare metal spots and/or coating gaps caused by the installation of screw anchors (another 80 locations will be visually inspected by divers in 2018), compromised cathodic protection, and historic excessive pipeline spans greater than the 75-feet limit (including a 286-foot span that was unsupported for years), as required by the legal operating agreement with the State of Michigan. Dynamic Risk's rationale for not analyzing new information related to the 48 bare metal spots: "it would be inappropriate to speculate on any of the above aspects of the coating condition." (Final Report ES-12). The question is: why would it be "inappropriate" when this is exactly the type of analysis the State of Michigan and the public expect. These independent experts are supposed to analyze the relevant information and evaluate the integrity of a failing aging infrastructure that threatens some 20 percent of the planet's fresh surface water. The only concession the Final Report makes is this: "that findings of the

[41] FLOW. The Upper Peninsula Has Viable Options to Line 5 for Its Propane Supply and Economy (Summer 2017) http://flowforwater.org/wp-content/uploads/2017/06/JR022-PROPANE-20170606.pdf

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CPCM tool [a cathodic protection inspection tool] may not be considered as definitive evidence that the coating in the Straits Crossing segments is well bonded to the pipe." (Final Report at ES-12).

J. The Final Report Underestimates the Economic and Natural Resource Damage of a Line 5 Spill at $100-200 million.

The Final Report continues to inadequately account for the full range of potential economic impacts of an oil pipeline rupture under the Straits of Mackinac. Just on its face, the report's economic number defies logic in light of Enbridge's 2010 $1.2 billion Kalamazoo disaster and the potential catastrophic harm for affected shoreline communities, tourism revenue, drinking water, fisheries, etc. The Final Report, however, rejects comparing Enbridge's Line 6B disaster to a potential Line 5 spill, reasoning that "there are too many differences in spill characteristics to draw effective comparisons." (Final Report at PR-15). This reasoning seems particularly weak since DR's estimate of a Great Lakes oil spill is one tenth the cost of an inland stream.

In addition, the Final Report overlooks the economic value[42] of *ecosystem services* provided by the aquatic and terrestrial ecosystems of the Great Lakes and how they would be affected by a credible worst-case oil spill. Validated tools exist for the valuation of these ecosystem services, and it would be in the best interest of current and future users of the resources of the Great Lakes to make decisions that consider the full range of their economic values. According to Michigan State University's Ecological Economist Professor Robert Richardson: "Ecosystems provide a range of benefits to all people, including the benefits of provisioning, regulating, cultural, and supporting services. The services and functions of ecosystems are critical for the support of life on Earth, and they contribute to human welfare both directly and indirectly. Ecosystem services are the functions of an ecosystem that generate benefits or value to humans; they are the conditions and processes through which natural ecosystems sustain and fulfill human life." [43] An example of valuation of ecosystem services from the Great Lakes comes from Krantzberg & de Boer (2008)[44] where the value of "Wetlands & Biodiversity" is estimated at $69 billion. These valuable ecosystem services include nutrient cycling, flood/erosion control, pollination, hydrological flows, and more. Any credible evaluation of Line 5 and the potential oil spill impacts must analyze ecosystem services.

The Final Report uses a number of vague and undefined terms, including "restoration costs of the natural environment" and "natural environment." The Final Report's use of a "broad range of environmental damages" would presumably include more than "air, water, and soil impacts"; however, this does not consider impacts to aquatic and terrestrial wildlife, habitat, and plants, and would also be subject to determination in terms of scope (e.g., would "water" include upstream impacts?).

Similarly, two other inadequately defined terms include "net income foregone in the sustainable harvest of a commercial resource", and "…a subsistence resource." Use of such terms limits the scope of economic damages to lost income only in harvestable resources (and again, the definition of "sustainable

[42] The Final Report uses a 6 percent discount rate to estimate present values; there is a great deal of economics literature that argues for very low (or zero) discount rates when estimating environmental costs primarily because of all of the non-market elements of environmental impacts.
[43] Robert B. Richardson, Ph.D. "Ecosystem Services and Food Security: Economic Perspectives on Environmental Sustainability," College of Agriculture and Natural Resources, Michigan State University, October 26, 2010 (citations omitted) http://www.mdpi.com/2071-1050/2/11/3520
[44] Krantzberg, Gail; De Boer, Cheryl. A Valuation of Ecological Services in the Laurentian Great Lakes Basin with an Emphasis on Canada. American Water Works Association. June 2008. https://www.awwa.org/publications/journal-awwa/abstract/articleid/15895.aspx

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harvest" could be subject to determination). This would seemingly ignore lost income (and derived benefits)[45] from non-commercial harvest (such as recreational fishing) and derived benefits from other forms of non-harvest recreation (e.g., value of beach recreation, bird watching, etc.) This also ignores foregone income from other commercial activities, such as lost revenue from tourism (including its sub-sectors, such as lodging, restaurants, and services [e.g., Mackinac Island Ferries]). This would also ignore economic damages borne by municipal drinking water systems, coastal residential property owners, and commercial real estate. Those damages would all have restoration costs associated with them. During the period of contamination, water presently used for municipalities and agriculture would presumably have to be replaced (i.e., bottled water, other sources for irrigation water). Finally, the Final Report does not mention scope of time considered, and there is potential for long-term consequences to the State's image, in terms of lost tourism revenue and coastal property values (think: *unPure Michigan*).

The Final Report also avoids acknowledging the wide range of uncertainty, including a worst-case scenario, which would have significant and widespread economic impacts and implications. An economic impacts study commissioned by the Sault Ste. Marie Tribe of Chippewa Indians concludes that the economic impacts of even a moderate breach of Line 5 would be economically substantial to the region. The report details the economic impact of a moderate spill in the counties of Emmet, Cheboygan, Mackinac, Charlevoix, Presque Isle, Chippewa, Luce, Benzie, Leelanau, Grand Traverse, Antrim, and Alpena. According to the report, the total GDP decline was estimated to exceed $800 million in the first year. Further, the aftermath of a breach is destined to result in a decline in property values totally over $1.2 billion. Additionally, the report comments on casino resorts, a main source of income and employment for the tribe. A spill is estimated to devastate casino resorts, resulting in a revenue decline of $69 million and a decline of up to 450 jobs over a three-year period.

Oil spills are known to affect ecosystems for decades.[46] The 2010 BP Horizon Spill offers a salient example of the lasting ecological impacts oil spills cause to animal and plant life in the Gulf of Mexico. A recent study, published in the journal *Archives of Environmental Contamination and Toxicology*, combined a review on fish numbers after the Deepwater Horizon spill with two studies the researchers published in 2014 on bird populations following the disaster.[47] The spill, caused by a BP oil well that blew out and gushed 200 million gallons of crude for 87 days, killed thousands of mammals and sea turtles and more than 1 million birds, and caused the accelerated loss of marsh areas through erosion and oil coverage.

Michiganders have deep, cultural connections to the Great Lakes. From fishing on its piers to weekend trips with the family to the beach, Michiganders value the Great Lakes for their livelihood and for their families' and friends' wellbeing. The State's successful tourism campaign, *Pure Michigan*, is built upon the image of Michigan's unspoiled waters and beaches and the iconic view of the Mackinac Bridge over the Straits. The value of these beaches, waters, and their ecosystems is estimated to be worth billions of dollars (Krantzberg and de Boer, 2008). Given the long-term ecological and economic impacts of oil spills, a credible and informative economic analysis of an oil spill within the Straits of Mackinac must

[45] Derived benefits mean economic benefits that accrue to both producers and consumers, like in the case of profits to recreational fishing operations, and satisfaction or "utility" that is enjoyed by recreational anglers. Therefore. there would be losses on both sides in the event of a spill.
[46] National Research Council (US) Committee on Oil in the Sea. 2003. Oil in the Sea III: Inputs, Fates, and Effects. https://www.ncbi.nlm.nih.gov/books/NBK220710/.
[47] Alexander Kaufman. "New Studies Show How The 2010 Gulf Oil Spill Still Starves Fish At Sea And Plants On Shore." Huffington Post, July 18, 2017 http://www.huffingtonpost.com/entry/new-studies-show-how-the-2010-gulf-oil-spill-still-starves-fish-at-sea-and-plants-on-shore_us_596e210ce4b010d77673edce?ncid=inblnkushpmg00000009

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quantify the value of these ecosystem services and passive uses, and incorporate them in estimates of potential damages.

K. The Final Report Fails to Evaluate the Future Market Demand for Transporting Petroleum and Natural Gas Liquids in an Ever-changing and Complex Commodities System.

The question of whether Line 5 is necessary to transport petroleum and natural gas liquids must take into account future market demand for these commodities. How much pipeline capacity will be needed in the future is an important question in assessing the future need for Line 5.

The emerging consensus is that the electrification of transportation will soon reduce future demand for petroleum. The evidence of an imminent dramatic shift in oil markets is overwhelming.

- Recent petroleum sector forecasts by Bloomberg, Navigant, Goldman Sachs, Wood Mackenzie, and others indicate that the transition to electric vehicles will accelerate quickly in the next 2 – 4 years with a corresponding drop in the demand for transportation fuels.
- The global auto industry has made clear that petroleum-free drivetrains will dominate future manufacturing investments with General Motors, VW, Volvo, and others announcing a clear shift in future product offerings that will not use petroleum products.
- Many countries including England, France, Norway, Netherlands, Slovenia, India and China have announced their intentions to ban the sales and, in some cases, the use of vehicles with internal combustion engines.
- Seven international oil companies – Exxon Mobil, Conoco Phillips, Statoil, Koch Industries, Marathon, Imperial Oil and Royal Dutch Shell are writing off tar sand assets in Alberta in recognition of reduced demand and declining profits.
- 213 North American oil and gas companies filed for bankruptcy in 2015 and 2016, listing more than $85 billion in debt.

The Final Report must take these future trends into account and assess the market impact of declining demand and the corresponding need for Line 5 as a conduit for petroleum products.

L. The Final Report Fails to Evaluate Tribal Sovereign Concerns and Rights.

The Final Report fails to consider tribal sovereign water-dependent treaty fishing rights and feedback on the basis that Dynamic Risk was not a party to tribal and state consultations. Under the Treaty of 1836, tribal sovereign rights in fishing are *superior* to any other interests, particularly interests of private persons using waters and bottomlands of the Great Lakes. This rationale is an unacceptable dismissal of input by a sovereign nation with superior fishing treaty rights. The five federally recognized tribes whose fishing grounds are located at the Straits of Mackinac have a deep cultural, spiritual, and economic connection to the Straits of Mackinac and the Great Lakes. Nearly 60 percent of the whitefish commercial fishery comes from the Straits.

M. The Final Report Erroneously Calculates the Probability of a Pipeline Rupture based on Average Weather Conditions Rather Than Extreme Conditions of High Winds and Waves.

Wind and wave conditions in the Straits of Mackinac fluctuate greatly, yet Dynamic Risk removed from their analysis the most likely condition when a rupture would occur—during peak wind and wave velocity. Peak water velocity in the Straits is estimated at least 20 percent higher than what Dynamic Risk evaluated. This decision to use meteorological data from a period where "Wind conditions are fairly

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average compared to other years, without any particular high wind events or extreme situations" defies common sense. According to the National Oceanic Atmospheric Administration ("NOAA"), "[t]he number of high-wave days expands dramatically if looking at when waves reached a 3- to 4-foot average for at least one hour of a day: That occurred, on average, 91 days per year between 2010 and 2014 . . . Waves reached 4 feet or higher at least part of a day an average of 44 days per year."[48]

Excluding the very conditions that would be expected to lead to a rupture of Line 5 is neither explained in the Final Report, realistic, or scientifically credible. As a result, DR has not considered the peak or frequency of more extreme wave action and currents. Moreover, the forces of currents are dependent on wind velocities, and not just wave size. Given that water pressure forces on Line 5 generally and scaled with water currents based on reliable wave data and wind velocities, Dynamic Risk's failure to use a robust examination of rupture risk on the most critical oil pipeline in the Great Lakes is a serious error.

N. The Final Report Raises Serious Conflict of Interest Concerns and Neglects to Provide the State with an Independent, Fair Analysis of the Alternatives to Line 5.

Conflict of interest, unfortunately, has been a pervasive problem throughout this entire process with the State of Michigan. Enbridge agreed to pay for the $3.2 million alternatives and risk analysis reports and serves alongside Marathon Petroleum on the Michigan Pipeline Safety Advisory Board that is advising Governor Snyder about the fate of Line 5. Enbridge's reach extends beyond paying for studies that are supposed to determine the fate of the Great Lakes. Recent evidence raises grave concern as to whether Dynamic Risk and its draft report have satisfied this conflict of interest prohibition. Any findings in the report must be viewed with that bias in mind.

Instead of turning to one of the state's universities to lead the study, officials chose Dynamic Risk even though the firm has worked for Enbridge on pipeline projects (recently the Sandpiper and the Line 3 Expansion Project) and is a leading player in the pipeline infrastructure industry. Dynamic Risk also conducted studies for Canadian officials that led to the approval by Quebec authorities of the reversal and expansion of 39-year-old Enbridge Line 9B, which in March 2016 began transporting heavy crude oil from western Canada to Sarnia, Ontario.

In addition, there are serious questions as to whether the authors of this Final Report, like those of the canceled risk report, have a conflict of interest. On August 24, 2016, as part of its contractual agreement with the State of Michigan, Dynamic Risk agreed to the following conflicts and ethics provision: "Contractors will uphold high ethical standards and is prohibited from (a) holding or acquiring an interest that would conflict with this Contract; (b) doing anything that creates an appearance of impropriety with respect to the award or performance of the Contract; or (c) attempting to influence or appearing to influence any State employee by the direct or indirect offer of anything of value."

Here's what we know. The consulting firm's vice president has an extensive history of working alongside of, and in support of, Enbridge. Also Dynamic Risk's chief engineer, James Mihell, may have worked for Enbridge on *Line 3's Replacement Project: Assessment of Accidental Releases: Technical Report* during the same period that Dynamic Risk developed the Line 5 Alternatives Assessment in direct violation of the contractual agreement with the State of Michigan. Enbridge hired Dynamic Risk for this Line 3 report in the fall of 2015, issued a draft on October 1, 2016, and a final report on January 13, 2017. Mihell's final signature appears on the Line 3 report dated January 13, 2017. To address this potential conflict of

[48] Keith Matheny. "Oil spill, high waves: A Great Lakes disaster scenario," Free Press, Dec. 5, 2015.https://www.freep.com/story/news/local/michigan/2015/12/05/enbridge-pipeline-straits-mackinac-oil-spill-waves/76728434/

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interest, the State of Michigan must determine if Dynamic Risk's Mihell worked on Enbridge's Line 3 report between August 24, 2016 (signing of the Line 5 contract) and January 13, 2017 (completion of the Line 3 report). A clear conflict of interest exists at any time up to the completion of this Draft Report.

Other companies with direct ties to Enbridge are playing key roles in the alternative study. The Stantec Company, which designs pipelines from engineering to construction, provided design support for the Keystone Pipeline and has been involved in the construction of multiple tunnels. According to Dynamic Risk's proposal to the state, G.A. Purves, Director of Oil & Gas for Stantec, and a member of the Line 5 Project Team, has provided engineering support for six Enbridge pipeline projects over two construction seasons. Harold Henry, another Line 5 Project Team member for Stantec, was project manager on Enbridge's Line 4 pipeline expansion. Riyaz Shiyji, Stantec director, provided support for multiple Enbridge projects in Canada.

Kelly Geotechnical Company also was selected to participate as a key Line 5 Project Team member while also providing engineering work for Enbridge pipelines in Minnesota and North Dakota on the same Sandpiper project involving Dynamic Risk. In addition, Kelly worked on an Enbridge gas pipeline project in 2015, the Enbridge Northern Gateway Pipeline Project from 2005-2015, and Spectra Energy projects from 2009 to 2011. Enbridge recently merged with Spectra. Line 5 project team member Shane A. Kelly, senior engineer for Kelly, worked in support of two Enbridge pipeline projects and two Spectra Energy projects.

All in all, this Final Report favors allowing Line 5 to continue to operate and/or allowing Enbridge to build new oil infrastructure and further expand its operations. That bias grows out of past and anticipated future business relationships between Enbridge and the report's authors. The standard for establishing credibility in the report's findings is outlined in the Task Force Report and requires that the authors are "wholly independent from any influence by Enbridge." Throughout the report it is evident that the analytic framework and that some of the conclusions significantly favor Enbridge and render the draft report unreliable and discredited.

Finally, as described on page 1 of these supplemental comments, the contractual provisions for Enbridge to conduct its own "in camera" review of the DR Final Report before it was released establishes an inherent potential conflict of interest. Unless DR, Enbridge, and the State disclose to the public on the DEQ or MPSAB website all comments, suggested edits, revisions or modifications of the Final Report, it must be deemed unreliable. The transparency called for by Governor Snyder (including the recent November 27th agreement with Enbridge) and other state officials demands such full disclosure.

O. The Final Report Ignores Feasible and Prudent Alternatives That Supply Line 5 Product Without Jeopardizing the Great Lakes. The Final Report Also Affirms That Line 5 Can Be Decommissioned With Minimal Disruption or Increased Cost to Michigan Consumers and Businesses and Is the Lowest Risk Option to Protect the Great Lakes.

Decommissioning Line 5 in the Straits of Mackinac is the only alternative that will prevent an oil spill with catastrophic consequences for the Great Lakes and the State of Michigan. DR's Final Report findings are consistent with FLOW's 2015 independent expert report, which concluded that:

- Decommissioning the twin pipelines in the Mackinac Straits to prevent a catastrophic oil spill would not disrupt Michigan's or the Midwest's crude oil and propane supply.
- Available capacity and flexibility to meet energy demand in the Great Lakes region already exists in the North American pipeline system run not only by Canadian-based Enbridge, but also by

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competitors supplying the same refineries in Detroit, Toledo, and Sarnia, Ontario.

- At least 90 percent of the oil moved through Line 5 ends up in Canadian refineries, undermining claims that the pipeline is an important source of crude for the Marathon refinery in Detroit.

The Final Report's evaluation of Alternative 6 affirms that there are feasible and prudent alternatives readily available that both meet Michigan's energy needs currently served by Line 5 *and* completely eliminate the risk to the Great Lakes. Feasible and prudent alternatives presently exist for:

> (1) delivering propane to Upper Peninsula consumers by truck and eventually by a 4-inch new pipeline;
> (2) transporting Northern Lower Michigan crude oil from Lewiston to refineries by truck (and eventually by an 8-inch pipeline); and
> (3) securing alternative crude oil sources for the Detroit and Toledo refineries from excess pipeline capacity on Line 6B (renamed 78) and the Mid-Valley Pipeline. (Final Report at 4-18).

The larger conclusion, based on this evidence, is that that the Straits Pipelines can be decommissioned with minimal disruption or increased cost to Michigan consumers and businesses.

IV. CONCLUSION

The DR Final Report collapses under the weight of the sheer number of faulty assumptions, misjudgments, errors and omissions it contains, nullifying its value as a tool in decision-making. The study can only be characterized as a poor rough draft that complicates the simple (by ignoring existing infrastructure as a feasible and prudent alternative) and simplifies the complicated (by favoring a tunnel and ignoring significant cost and engineering matters). On its face, the study is fundamentally flawed and cannot be redeemed through quick editing and continued bias or arbitrary cutting off of the significant technical and thoughtful comments and questions raised by organizations and citizens from a wide-range of interests and concerns. It should be set aside.

These facts are clear: The magnitude of a risk of an oil spill in the Great Lakes is too severe to allow Line 5 to continue to operate in the Great Lakes. Michigan should not put the Great Lakes, our economy, health, drinking water, fisheries, and way of life at risk from a catastrophic oil spill any longer.

Regardless of whether the significant flaws in the report are addressed, the State has ample information it needs to act under law, both in terms of the lack of benefit to Michigan interests from continuing with the status quo (or adopting the tunneling or trenching alternatives) and the significant costs to Michigan and tribal interests of doing so. It is not necessary to take another six-months or year to flesh out all of those costs in the detail that should have been present in the draft report.

Decommissioning Line 5 in the Straits of Mackinac is the only alternative that will prevent an oil spill with catastrophic consequences for the Great Lakes and the State of Michigan. It is time for the state to stop delaying action with flawed studies, exercise its legal duty as public trustee, and shut down Line 5. The state should use that authority under the easement to revoke and/or terminate it, and under the Great Lakes Submerged Lands Act, and its Rules, to require Enbridge to submit and demonstrate through comprehensive alternative analysis that there is no other feasible and prudent alternative combination of existing, modified and expanded pipeline capacity and design capacity to Line 5 and any other crude oil

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pipeline in or under the Straits and Great Lakes.[49]

The time for studies has ended. It is time for action. That action should be the state's revocation of the easement and the decommissioning of Line 5.

Thank you for the opportunity to comment.

Sincerely yours,

James M. Olson
President

Elizabeth R. Kirkwood
Executive Director

CC: U.S. Senator and Hon. Gary Peters
U.S. Senator and Hon. Debbie Stabenow

[49] MCL 324.32501 et seq. The GLSLA expressly prohibits oil wells and the necessary pipelines for transport in the public trust waters or on under the bottomlands of the Great Lakes.

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