



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

August 4, 2017

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VIA ELECTRONIC SUBMISSION

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

Dear Michigan Office of the Attorney General, Michigan Department of Environmental Quality (“MDEQ”), Michigan Department of Natural Resources (“MDNR”) and Michigan Agency for Energy (“MAE”):

For Love of Water (“FLOW”) is submitting this official comment in response to the Line 5 Draft Alternatives Analysis prepared by Dynamic Risk for the State of Michigan. As you are aware, for over three years, FLOW (“For Love of Water”) – a Great Lakes policy center – has independently examined and submitted reports and comments on the technical, scientific, circumstances, and legal principles we believe the State should apply when addressing Enbridge Energy LLP’s (“Enbridge”) Line 5 twin-pipelines in the Straits of Mackinac. It is particularly important to consider the paramount public trust interests of the Great Lakes, the age and condition of the pipeline, the currents and dynamic forces affecting the pipeline, the high risk of severe harm, and the existence of easily adjusted alternative pipeline capacities and infrastructure when evaluating the pipelines in the Straits.

As in the past, the goal of our research and analysis is to provide officials with an independent and credible source of information to assist the State of Michigan in the exercise of its legal responsibility to protect the Great Lakes and their tributary waters from risk of serious harm. This responsibility is “a high, solemn and perpetual duty”<sup>1</sup> to protect the paramount public trust in these waters from endangerment and unacceptable risks. Once again, our research and analyses 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 Lakehead system, the state has violated this duty.

**I. INTRODUCTION: PROCEDURAL HISTORY IN DETERMINING THE FATE OF LINE 5**

<sup>1</sup> *Collins v Gerhardt*, 237 Mich 38; 211 NW 115, 118 (1926).

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<sup>2</sup> 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 evaluating 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") 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. Nearly two years later, despite mounting evidence of Enbridge's ongoing serious violations to occupy our public waters and bottomlands in the Great Lakes, only one of the independent draft reports is available for public comment – the Dynamic Risk draft alternatives analysis – because of a conflict of interest on the part of the consultant for the State that forced the State to scrap the risk report. A closer look reveals that Dynamic Risk's draft alternative report 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 draft 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.<sup>3</sup>

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, allowed Enbridge to continue to profit from its aging asset that threatens our public waters, and failed to set a bright and definitive time line to decommission Line 5.

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<sup>2</sup> 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](http://www.mlive.com/business/west-michigan/index.ssf/2013/08/enbridge_inc_crews_replace_lin.html).

<sup>3</sup> 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](https://www.epa.gov/sites/production/files/2017-06/documents/enbridgeentered-cd_0.pdf)

## II. DYNAMIC RISK DRAFT ALTERNATIVES ANALYSIS REPORT

According to the State of Michigan's scope of work, the overall objective of Dynamic Risk's alternatives analysis report "is 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, this report would provide 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 scope of work charged Dynamic Risk to evaluate six alternatives, which include:

Alternative 1: Construct one or more new pipelines that do not cross the open waters of the Great Lakes and then decommission the existing Straits pipelines.

Alternative 2: Utilize existing alternative pipeline infrastructure that does not cross the open waters of the Great Lakes and then decommission the existing Straits pipelines.

Alternative 3: Use alternative transportation methods (e.g., rail, tanker trucks, oil tankers and barges) and then decommission the existing Straits pipelines.

Alternative 4: Replace the existing Straits pipelines using the best available design and technology. This Alternative considered two separate Straits pipeline crossing designs: a. Alternative 4.a. Conventional trenched installation b. Alternative 4.b. Tunnel installation

Alternative 5: Maintain the existing Straits pipelines. As part of the analysis associated with this Alternative, the results of the threat and risk modeling were leveraged to provide an evaluation of the safe and reliable operating life of the existing Straits crossing pipelines

Alternative 6: Eliminate the transportation of all petroleum products and natural gas liquids (NGLs) through the Straits of Mackinac segment of Enbridge's Line 5 and then decommission that segment. This alternative would also reflect potential viability of continued NGL deliveries to the Upper Peninsula at Rapid River, and the continued receipt of Michigan light oil production at Lewiston.

Despite producing a 337-page report with hundreds of pages of appendices, this Draft Report summarily 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. 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 Draft 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.<sup>4</sup>

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<sup>4</sup> 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->

As more fully described later in these comments, the arbitrary early rejection of recently increased and adjustable capacity of existing pipeline infrastructure, along with other assumptions, 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.. The tunnel alternatives only serve to reduce, not prevent a spill and disaster. 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.

### III. MAJOR SHORTCOMINGS IN THE DRAFT ALTERNATIVES REPORT

This section highlights major shortcomings in Dynamic Risk’s Draft Alternatives Analysis Report (“Draft 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.<sup>5</sup> At the outset, two threshold matters concerning the report must be addressed.

First, Dynamic Risk assumes in its Draft 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. 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<sup>6</sup> and the declared “paramount public concern” in water, natural resources and public trust under the Michigan Constitution and law.<sup>7</sup>

Second, as described above, Dynamic Risk admittedly 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. 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.<sup>8</sup> 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.<sup>9</sup> 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

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[content/uploads/2015/12/FLOW-Composite-Report-12-14-15-FINAL-1.pdf](http://flowforwater.org/wp-content/uploads/2015/12/FLOW-Composite-Report-12-14-15-FINAL-1.pdf) and Section III below, including Appendix A. Richard Kane. *Comments on the Dynamic Risk Report: Draft Final Report – Alternatives Analysis for the Straits Pipeline*. (August 4, 2017).

<sup>5</sup> *Id.*

<sup>6</sup> 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>

<sup>7</sup> 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).

<sup>8</sup> 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>

<sup>9</sup> Appendix B. Richard Kane. *Defining A Worst-Case Release Scenario for the Enbridge Crude Oil Pipelines Crossing the Straits of Mackinac*. (August 4, 2017).

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) and the probability of the event occurring is relatively low.<sup>10</sup> Dynamic Risk estimated there is a 1 in 60 chance probability that a release will occur damaging 20 miles of waters, natural resources, and shoreline between 2018 and 2053—in the next 35 years. Despite the fact that Dynamic Risk did not follow “worst-case scenario” risk protocols, this risk is itself unacceptable, and if a proper risk and worst-case analysis is applied, the degree of harm from threats and vulnerabilities and risks is much higher. 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.

Other significant flaws, errors, or improper analyses by Dynamic Risk are set forth below. The Draft Report:

- **Incorrectly assumes Line 5 is 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 Draft 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. . . . Of the NGLs transported on Line 5, less than 5% are delivered into Rapid River [in the Upper Peninsula]. Lewiston oil injections are also less than 5% of Line 5 current throughput and do not appear to be increasing.” (Draft Report at 4-4 and 4-5).

The Draft 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 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 findings of FLOW’s 2015 expert report, co-authored by a retired Dow chemical engineer and a highly regarded hazardous materials risk management specialist, specifically informed deliberations by State officials and the Pipeline Safety Advisory Board; however, the Dynamic Risk Draft Report never makes mention of this public record and report or any other studies that have examined alternative existing pipeline infrastructure.

- **Ignores feasible and prudent alternatives that supply Line 5 product without jeopardizing the Great Lakes.**

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<sup>10</sup> 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>



The Draft 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 (Draft Report at 4-6-4-13);
- (2) transporting Northern lower Michigan crude oil from Lewiston to refineries by truck (Draft Report at 4-14-4-15); and
- (3) securing alternative crude oil sources for the Detroit and Toledo refineries (Draft Report at 4-16-4-21).

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.

While not examined in this Draft Report, FLOW independently prepared a 2015 expert report titled "*Eliminating the Line 5 Oil Pipelines' Unacceptable Risk to the Great Lakes through a Comprehensive Alternatives Analysis and Systems Approach*,"<sup>11</sup> 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.

- **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.**

In the 1953 easement agreement between Enbridge (predecessor Lake Pipe Line Company) and 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.<sup>12</sup> 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

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<sup>11</sup> <http://flowforwater.org/wp-content/uploads/2015/12/FLOW-Composite-Report-12-14-15-FINAL-1.pdf>

<sup>12</sup> 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](http://www.michigan.gov/documents/deq/Appendix_A.3_493982_7.pdf)

the original design capacity.<sup>13</sup> 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.<sup>14</sup>

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<sup>15</sup> 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.<sup>16</sup> 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,<sup>17</sup> making Line 5

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<sup>13</sup> 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>

<sup>14</sup> 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 Segmentation Map and “maintenance” applications for several anti-friction stations to increase volume flow rate in Line 5.

<sup>15</sup> “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](https://www.epa.gov/sites/production/files/2017-05/documents/enbridge_entered_consent_decree_may_2017.pdf)

<sup>16</sup> 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 10 Michigan Counties (Jan. 31, 2013) [http://www.michigan.gov/mpsc/0,4639,7-159-16400\\_17280-294097--,00.html](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](http://www.michigan.gov/mpsc/0,4639,7-159-16400_17280-313062--,00.html)

<sup>17</sup> 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.

inessential.<sup>18</sup>

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,<sup>19</sup> So the expanded 800,000 bbl ultimate design capacity is nearly four-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 segment to increase capacity through a southern branch to Toledo and Detroit refineries. Had the MPSC or MDEQ when it received new improvements to Line 5 properly evaluated alternatives to the Lakehead system, including Lines 6B and Line 5, from 2011 through 2015. Had this been demanded, the high risks and degree of harm that threatens to irreparably destroy Straits and massive reaches of Lake Huron and Lake Michigan would have been identified and alternatives to eliminate the risk implemented.

- **Dismisses the most credible alternative of existing pipeline infrastructure and provides insufficient reasoning for the exclusion.**

The Draft 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 unacceptable that the contractor eliminated this alternative in the early stages of analysis in violation of the express terms of state contract and the clear recommendations and standards outlined in the Michigan Petroleum Pipeline Task Force Report. As a result, the Dynamic Risk report leaves 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.

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 urge the state to conduct a broad system approach or otherwise would 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." As indicated above, the DR analysis 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.

Expert advisors to FLOW have analyzed and documented the practicality of this alternative for Michigan's energy needs,<sup>20</sup> and FLOW comments and these experts' reports have been part of the public

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<sup>18</sup> 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>.

<sup>19</sup> 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.

<sup>20</sup> See <http://flowforwater.org/wp-content/uploads/2015/12/FLOW-Composite-Report-12-14-15-FINAL-1.pdf>



record of the State, including the Pipeline Safety Advisory Board, Attorney General's Office, and MDEQ. Yet the Dynamic Risk report does not mention these comments and reports. 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. Requiring such an approach for Dynamic Risk's draft alternatives analysis will also advance the legal obligations of the MPSC and DEQ to require comprehensive impact and alternatives assessment.

- **Overestimates the impact on propane supply of decommissioning Line 5.**

What we know from Dynamic Risk's Draft 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 Draft 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.<sup>21</sup> Most significantly, the Draft 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.

- **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 Draft 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. The Dynamic Risk 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 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 ;

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<sup>21</sup> 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>

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’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 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.<sup>22</sup>

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 (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 global warming on the frequency and magnitude of these events must be included.<sup>23</sup>

Not surprisingly, the Draft Report uses assumptions of risk and an averaging model of all oil spills that are not credible. The result is estimates that:

- An average of 20 miles of shoreline would be impacted by a spill. By contrast, the University of Michigan 2016 study found that over 700 miles of coastline in Lakes Michigan and Huron are vulnerable to a catastrophic oil spill.
- An oil spill would cost \$100 to \$200 million when Enbridge’s cleanup costs of its Kalamazoo River Line 6B pipeline oil spill in 2010 cost more than \$1.2 billion.

The Draft Report grossly underestimates a worst-case release from Line 5 limiting this number to 4,500 barrels (coincidentally the number Enbridge uses to estimate worst-care spill). The magnitude of the risk of a spill is vastly understated, particularly in light of the independent study conducted by the University

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<sup>22</sup> 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>

<sup>23</sup> *Id.* at 6.

of Michigan, which concluded that the Straits of Mackinac are the “worst possible place” for a Great Lakes oil spill, which could pollute up to 720 miles of shoreline along Lake Michigan and Lake Huron.

The need for a proper “worst-case scenario” risk assessment is also essential as a result of 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 submit 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.*”<sup>24</sup> 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<sup>25</sup> 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.

- **Grossly underestimates the probability of pipeline failure by ignoring 50 years of structural stress, currents, and gravitational forces.**

The Draft Report estimates the likelihood of pipeline failure at an alarming 1 in 60 chance by ignoring 50 years of pipeline history (prior to 2003), including evidence of pipeline stresses, deformations, erosion, and bending from extreme currents and gravity in its risk modeling. An investigation and calculations submitted with these comments by Dr. Ed Timm reflect the reality of the effects of waves, turbulence and sagging of unsupported spans on the twin-pipelines from 1953 forward show an alarmingly high or imminent probability of occurrence.<sup>26</sup>

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.

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<sup>24</sup> See Appendix B. Rick Kane. *Defining a Worst-Case Release Scenario for the Enbridge Crude Oil Pipelines Crossing the Straits of Mackinac – Line 5*, (August 4, 2017) and Appendix C. Gary Street, P.E. *The Worst-Case Scenario for a Rupture of Enbridge Line 5 at the Straits of Mackinac*. (August 4, 2017).

<sup>25</sup> A single rupture from anchor drag would release approximately 30,000 barrels (1.25 million gallons). Timm, E. E. (2017) *An Analysis of Errors and Omissions in the Dynamic Risk, Inc. Line 5 Alternatives Analysis, Option 5*. Retrieved from MPSAB website: <https://mipetroleumpipelines.com/sites/mipetroleumpipelines.com/files/Errors%20and%20Omissions%20Technical%20Note.pdf> “A very simple risk estimate for the whole of the underwater section of Line 5 can be done based on the average failure rate for all DOT 195 pipelines from all causes. This risk is given as 0.89 failures/(1000 mi \* yr)<sup>23</sup>. Using this figure, the risk of failure for the 8.15 miles of twinned lines under the Straits gives a failure rate of 7.25\*10<sup>-3</sup> per year.”

<sup>26</sup> Appendix D. Dr. Timm. *Technical Note: An Analysis of Errors and Omissions in the Dynamic Risk, Inc. Line 5 Alternatives Analysis, Option 5*, p. 9-11 (July 20, 2017).

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.

Instead, Dynamic Risk estimated pipeline risk using a flawed mathematical model that assumed the pipeline to be in brand new condition and started the analysis in 2018 to predicting risk of pipeline rupture or failure to 2053. While Dynamic Risk predicted a 1 in 60 chance of pipeline rupture and release of 4500 barrels, this does not account for continuous damage to the pipelines over the 64 years they have been subjected to the effects of currents and gravity, causing bending, deformation, and potentially serious fatigue that could result in failure. As a result, the expected failure probability of Line 5 under the Straits is 46.4% in 2017 and 72.5% in 2053 based on the average failure rates for all DOT 195 pipelines from all causes, according to a July 21, 2017, analysis by Dr. Ed Timm.<sup>27</sup> Dynamic Risk's 1.6% figure simply does not compute based on the historical condition and stresses documented on Line 5 in the Straits.

- **Fails to examine the causes and impacts of pipeline damage on Line 5 despite documented evidence of pipeline damage.**

The Draft Report states that two bends found within three feet of a girth weld in the exposed underwater section of Line 5 (West Leg) are of unknown origin but "may have been intentionally or unintentionally created as part of the installation process." (Draft Report 2-33). This statement is speculation on the part of the authors of the Alternatives Analysis. A review of publicly available records and data by Dr. Ed Timm suggests that the type of bends and other damage found along the pipeline are consistent with damage created by gravity and strong currents and not original installation in 1953:

These features are not consistent with "sag bends" that form as a pipeline is sagged into place along a poorly graded path but rather appear to have been bent both vertically and laterally which is what would be expected if they had been formed by the combined forces of gravity and currents. It is exceedingly unlikely that these bends were formed during construction since the pipe was pulled along the bottom of the Straits using great force, a process that would insure a straight path. These bends are not mentioned on the 1979 profile drawing of the pipe which includes many notes about the condition of the pipe at that date.<sup>28</sup>

Original Bechtel documentation also makes no mention of this damage. That this critical finding of damage was dismissed by the authors of the Alternatives Analysis without any investigation or explanation is puzzling and demands a full explanation of the evidence.

In addition, the Draft Report does not acknowledge or account for the structural stress and bending damage identified in the Kiefner report and Enbridge's 2017 anchoring permit request, showing problems with unsupported spans up to 286 feet in length.

Enbridge's span spreadsheet provides an insight on the W11 span indicating the following: "Install anchors to support deflection area just south of span W-11." Of the 22 new screw anchors for which Enbridge is currently requesting legal permission from the MDEQ under a Great Lakes Submerged Lands Act ("GLSLA") permit to install new structures on Line 5 in the Straits, five are to be located in areas

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<sup>27</sup> *Id.*

<sup>28</sup> *Id.* p. 16.

where bends and other features point to pipeline damage. According to Dr. Timm, this permit request acknowledges that “Line 5 under the Straits was damaged due to the forces of gravity and current sometime after construction.”<sup>29</sup>

Documents also show that section of pipe is ovalized twice with inspection reports revealing that both ovalizations have worsened slightly since 2013. Enbridge’s 2013 and 2016 [inspection reports](#) document these anomalies by sending “geopig” robots inside the pipeline to check for problems. Dynamic Risk speculates that these anomalies (bends and ovalizations) occurred during 1953 construction,<sup>30</sup> a speculation that contradicts fluid dynamics, years of forces and repeated erosion, and evidence of bending and deformation or “ovaling.”<sup>31</sup> (Draft Report 2-33).

- **Erroneously calculates the probability of a pipeline rupture based on average weather conditions rather than extreme conditions of high winds and waves.**

Most people understand that structures do not fail during nice weather. 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% higher than what Dynamic Risk evaluated. This decision to use meteorological data from a period where “Wind conditions are fairly average compared to other years, without any particular high wind events or extreme situations” defies common sense. Excluding the very conditions that would be expected to lead to a rupture of Line 5 is neither explained in the Alternatives Analysis nor realistic. As a result, Dynamic Risk has not considered the peak or frequency of more extreme wave action and currents. Given that water pressure forces on Line 5 generally and scaled with water currents, 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.

- **Operates from a bias favoring a tunnel in the Straits of Mackinac (Alternative 4b).**

Dynamic Risk’s Draft Report estimates the price tag of constructing a tunnel under the Straits at \$150 million cost, failing to even cite other comparable estimates for this type of infrastructure. 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.<sup>32</sup>

The Draft 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. (Draft Report 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 “could be stretched beyond their limits.” (Draft Report 3-19). Moreover, the study notes that construction crews would compete for short-term rental housing with seasonal tourism employees. That

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<sup>29</sup> *Id.* p. 19.

<sup>30</sup> [http://www.mlive.com/news/index.ssf/2017/07/line\\_5\\_bends\\_ovals.html](http://www.mlive.com/news/index.ssf/2017/07/line_5_bends_ovals.html)

<sup>31</sup> Appendix D. Dr. Timm. *Technical Note: An Analysis of Errors and Omissions in the Dynamic Risk, Inc. Line 5 Alternatives Analysis, Option 5*, p. 18, (July 20, 2017).

<sup>32</sup> *Wayne County Health Dept. v Olsonite*, 79 Mich. App. 668 (1977).



would likely raise housing costs as well as availability, negatively impacting motels, restaurants and other tourist-oriented businesses.

The Draft 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, Marine Pollution Control, is located in the event additional response equipment is needed.<sup>33</sup>

In addition, the Draft Report fails to address the infeasibility of obtaining a new conveyance or occupancy agreement and other permits under the Great Lakes Submerged Lands Act.<sup>34</sup> 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.<sup>35</sup> 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.<sup>36</sup> 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.<sup>37</sup>

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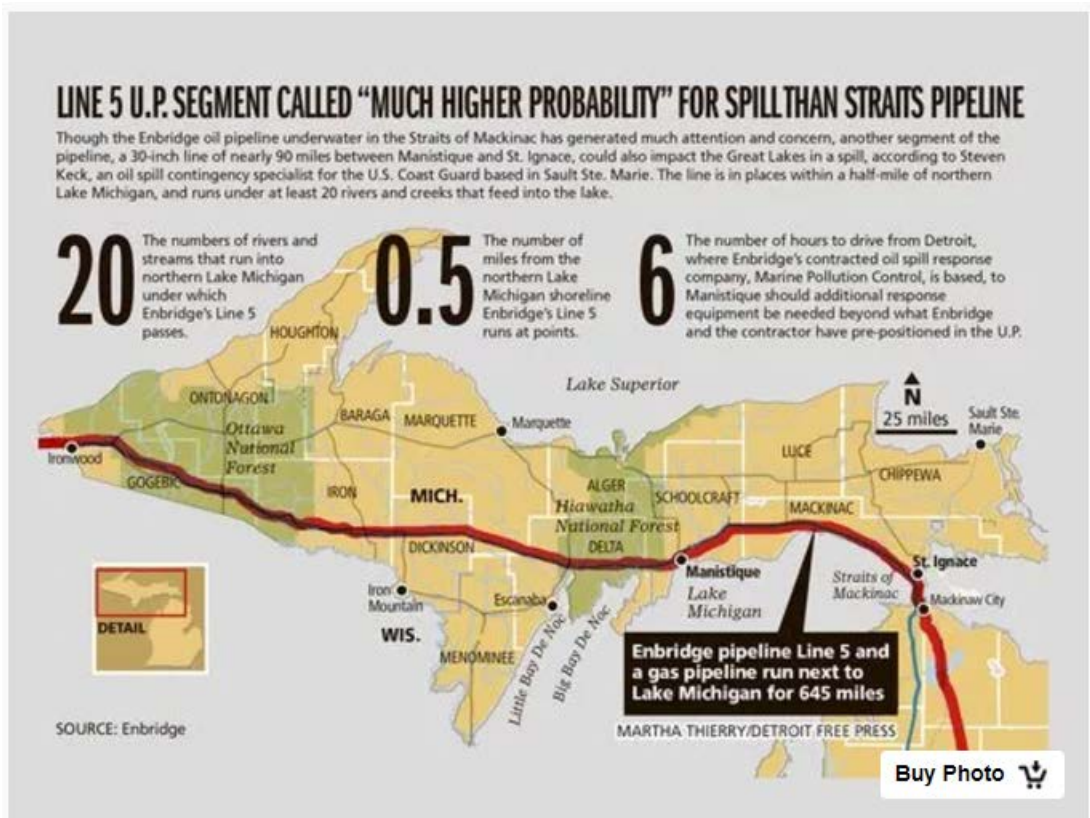
<sup>33</sup> Keith Matheny, “Great Lakes face threat from Enbridge Line 5,” Oct. 3, 2015 <http://www.freep.com/story/news/local/michigan/2015/10/06/great-lakes-face-threat-another-enbridge-line/73170338/>

<sup>34</sup> MCL 324.32501 et seq. and its Rules.R 322.1001 et seq.

<sup>35</sup> MCL 324.32503(2).

<sup>36</sup> *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).

<sup>37</sup> GLSLA Rule 1015, R 322.1015; MEPA, MCL 324.1705.



- Underestimates the economic and natural resource damage of a Line 5 spill at \$100-200 million.

The Draft Report inadequately accounts for the full range of potential economic impacts of an oil pipeline rupture under the Straits of Mackinac. At the July 6, 2017 Lansing presentation, Dynamic Risk admitted that they only evaluated environmental costs that could be “monetized.” Specifically, the report overlooks the economic value 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.”<sup>38</sup> An example of valuation of ecosystem services from the Great Lakes comes from Krantzberg & de Boer (2008)<sup>39</sup> where the value of

<sup>38</sup> 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>

<sup>39</sup> 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>

“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.

In addition, the report avoids acknowledging the wide range of uncertainty, including a worst-case scenario, which would have significant and widespread economic impacts and implications. 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.

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. (ES-2) Further, the aftermath of a breach is destined to result in a decline in property values totally over \$1.2 billion. (ES-3) 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. (ES-4)

Oil spills are known to affect ecosystems for decades.<sup>40</sup> The 2010 BP Horizon Spill offering 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.<sup>41</sup> 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 impacts of oil spills, a credible and informative economic analysis of an oil spill within the Straits of Mackinac must quantify the value of these ecosystem services and passive uses, and incorporate them in estimates of potential damages.

- **Lacks critical data and suffers from methodology problems.**

There is no reference to multiple technical submissions made to the Pipeline Taskforce and the PSAB,

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<sup>40</sup> 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/>.

<sup>41</sup> 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=inbInkushpmsg00000009](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=inbInkushpmsg00000009)

including reports from Kiefner & Associates, Dr. Timm,<sup>42</sup> FLOW, Oil & Water Don't Mix, Straits Area Concerned Citizens for Peace, Justice, and the Environment, Sierra Club, National Wildlife Federation and many other organizations. The PSAB was informed that these submissions were being provided to the consultant.

In addition, the State of Michigan should demand Enbridge release the following documents cited in the Dynamic Risk Alternatives Analysis:

[12] Analysis of Spans, J. P. Kenny report to Enbridge, 2003.

[37] Bechtel Corporation, "Specifications for the Construction of 630 Mile Crude Oil Pipeline," 1952.

[48] Hanson Survey & Design Ltd., "Interrupted Close Interval Pipeline Survey Report," September, 2003.

[71] Det Norske Veritas, ""Recommended Failure Rates for Pipelines", DNV Report No. 2009-1115, Rev. 1," November 16, 2011.

[83] Det Norske Veritas, "Recommended Practice DNV-RP-F105, "Free Spanning Pipelines", " February, 2006.

[88] K. Koushan, ""Vortex Induced Vibrations of Free Span Pipelines," Norwegian University of Science and Technology, Centre for Ships and Ocean Structures, 2009.

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<sup>42</sup> Timm, E. E. (2015) *Enbridge Energy Partners Limited Line 5, Straits of Mackinac Crossing Engineering Opinion Report*; Timm, E. E. (2015) *Quality Control and Interpretation of Pipeline In-Line-Inspection (ILI) Data*. Retrieved from FLOW website: <http://flowforwater.org/wp-content/uploads/2015/09/Final-Appendices-9-21-15.pdf>; Timm, E. E. (2015) *Regarding the Protective Coating and Support Requirements of Line 5*. Retrieved from FLOW website: <http://flowforwater.org/wp-content/uploads/2015/09/Final-Appendices-9-21-15.pdf>; Timm, E. E. (2016) *Bimodal Modeling of Buried Pipeline External Pitting Corrosion*; Timm, E. E. (2016) *Regarding Enbridge Line 5 Non-Compliance with 1953 Easement Requirements: A Mechanistic Analysis of Straits Pipeline Washout Phenomena*. Retrieved from FLOW website: <http://flowforwater.org/wp-content/uploads/2016/08/FLOW-FINAL-Supplemental-Letter-to-DEQ-USCOE-with-Technical-Note-Dr.-Ed-Timm-08-25-16.pdf>; Timm, E. E. (2017) *Regarding Enbridge Line 5 Coating Condition and Related Observations*. Retrieved from FLOW website: <http://flowforwater.org/wp-content/uploads/2017/06/Final-Letter-re-corrosion-violations-3-9-17-SIZE-ADJUSTED.pdf>; Timm, E. E. (2017) *An Investigation into the Effect of Near Bottom Currents on the Structural Stability of Enbridge Line 5 in the Straits of Mackinac*. Retrieved from NWF Blog: <http://blog.nwf.org/wp-content/blogs.dir/11/files/2017/03/2017-Edward-Timm-Currents-and-Stresses-Report.pdf>; Timm, E. E. (2017) *Regarding Enbridge Line 5 Non-Compliance with 1953 Easement Requirements: A Mechanistic Analysis of Straits Pipeline Washout Phenomena* (Supplemental Addendum to Technical Note). Retrieved from FLOW website: <http://flowforwater.org/wp-content/uploads/2017/06/APPENDIX-E.pdf>; Timm, E. E. (2017) *An Analysis of Errors and Omissions in the Dynamic Risk, Inc. Line 5 Alternatives Analysis, Option 5*. Retrieved from MPSAB website: <https://mipetroleumpipelines.com/sites/mipetroleumpipelines.com/files/Errors%20and%20Omissions%20Technical%20Note.pdf>

The Dynamic Risk analysis lacks considerable additional data and information, further undermining its value. It fails to analyze the effective life of the existing pipelines. It does not report on the number of anchor drops in the Great Lakes, weakening still further the “worst case” analysis. It also fails to use primary data collection or public processes, reasoning that this 337-page document should be regarded as “preliminary screening exercises.” (Draft Report TS-5).

- **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 Draft 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 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 Draft 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 anticipation of 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.

#### **IV. THE STATE'S PUBLIC TRUST DUTY IS PARAMOUNT AND CONTINUOUS.**

As well established by FLOW's research and previous comments to the Pipeline Task Force, the Pipeline Advisory Board, DEQ, and Attorney General, 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.<sup>43</sup>

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.<sup>44</sup>

The "public trust doctrine is alive and well in Michigan."<sup>45</sup>The public's property interest is "a title held in

<sup>43</sup> *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*).

<sup>44</sup> *Illinois Central R. Co.* 146 U.S. at 455.

<sup>45</sup> *Glass v. Goeckel*, 473 Mich. 667, 681 (Mich. 2005).

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.”<sup>46</sup> 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.<sup>47</sup> 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.<sup>48</sup> Moreover, the legislature cannot give away or sell its discretion; Enbridge’s easement is subject to termination and revocation.<sup>49</sup>

## V. CONCLUSION

The alternatives study 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. To summarize, the study:

- Wrongly assumes that Line 5 is essential to Michigan’s overall economy.
- Ignores feasible and prudent alternatives that supply Line 5 product without jeopardizing the Great Lakes.
- Erroneously assumes that the State of Michigan must guarantee that Enbridge is able to deliver 23 million gallons of oil daily through Line 5.
- Dismisses the most credible alternative of existing pipeline infrastructure and provides insufficient reasoning for the exclusion.
- Overestimates the impact on propane supply of decommissioning Line 5.
- Fails to provide a credible worst-case scenario spill and cost analysis and grossly underestimates the impact on Michigan of a Line 5 spill.
- Grossly underestimates the probability of pipeline failure by ignoring 50 years of structural stress, currents, and gravitational forces.
- Fails to examine the causes and impacts of pipeline damage on Line 5 despite documented evidence of pipeline damage.
- Erroneously calculates the probability of a pipeline rupture based on average weather conditions rather than extreme conditions of high winds and waves.
- Raises serious conflict of interest concerns and neglects to provide the state with an independent, fair analysis of the alternatives to Line 5.
- Operates from a bias in favoring a tunnel in the Straits of Mackinac (Alternative 4b)
- Underestimates the economic and natural resource damage of a Line 5 spill at \$100-200 million
- Lacks critical data and suffers from methodology problems.

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. 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

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<sup>46</sup> *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).

<sup>47</sup> *Glass*, 473 Mich. at 683,673.

<sup>48</sup> *Ill. Central R.R. Co.*, 146 U.S. at 453.

<sup>49</sup> *Id.*, 146 U.S. at 460.

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.

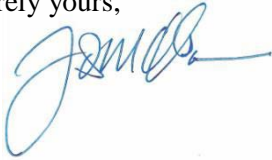
Regardless of whether the significant flaws in the report are addressed, the State has the information it needs to act under law, both in terms of the lack of benefit to Michigan interests from continuing with the status quo (or adopting the tunneling or trenching alternatives) and the significant costs to Michigan 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 through enforcement of its easement, an agreement that Enbridge has consistently violated.

The time for studies has ended. It is time for action. That action should be the state's termination 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: Michigan Governor Rick Snyder Michigan Attorney General Bill Schuette  
MDNR Director Keith Creagh  
U.S. Senator and Hon. Gary Peters  
U.S. Senator and Hon. Debbie Stabenow