

## Reasons to Decertify the Enbridge Integrated Contingency Plan for the Superior Region (#866) Response Zone

### Executive Summary

Prevention of an oil spill is the absolutely best course of action, but Enbridge's best efforts to maintain high operational readiness on an aging pipeline cannot guarantee this. It is critical that a well conceived oil spill response plan be on hand, accompanied by adequate pre-positioning of necessary assets and trained personnel within close proximity of a spill site. This is absolutely necessary to minimize ecological and economic losses and to protect public safety. A careful review of Enbridge's Integrated Contingency Plan for the Superior Region Response Zone and prior After Action Reports from recent Spill Exercises leads to the conclusion that **Enbridge is ill-prepared to contain and clean up an oil spill in the upper Great Lakes including the Straits of Mackinac.** Furthermore, the U.S. Department of Transportation (USDOT), Pipeline and Hazardous Materials Safety Administration (PHMSA) should never have certified the Enbridge Contingency Plan with its inherent shortcomings and oversights. This lack of due diligence needs to be corrected and a moratorium on crude oil shipments through Line 5 needs to be ordered until this situation is remedied.

### Authorities

#### Pertinent Federal and State Authorities

In accordance with regulations outlined in 49 CFR 194 (Response Plans for Onshore Pipelines), Enbridge must prove that they have a federally approved contingency plan that identifies adequate resources to contain and clean-up a spill from their facilities. Amendments to these laws were included in Public Law 112-90 entitled "Pipeline Safety, Regulatory Certainty, and Job Creation Act of 2011. In addition, certain sections of 33 CFR 311 -Water Pollution Control Act impact PHMSA's authority to approve Enbridge's Contingency Plan for the Superior Region (#866) Response Zone including Line 5.

49 CFR 195 (Transportation of Hazardous Liquids by Pipeline) prescribes safety standards and reporting requirements for pipeline facilities used in the transportation of hazardous liquids or carbon dioxide. It includes requirements for accident and safety-related condition reporting, design requirements, construction, pressure testing, operation and maintenance, high consequence areas, integrity management, pipeline personnel qualifications and corrosion control. An array of reasonable concerns have been noted over the last year by non-industry reviewers that Enbridge's integrity management, corrosion control systems and operations and management of Line 5 are inadequate to prevent a catastrophic release of crude oil into the waters of the Great Lakes.

The State of Michigan is currently conducting a comprehensive review of the risk that continued operations of Line 5 poses to the economy and environment of the region, in addition to the degree of liability compensation that Enbridge currently holds and whether suitable alternatives exist for the transmission of liquid hazardous materials through the line.

These studies are confined to the Straits of Mackinac segment of Line 5, as the State of Michigan has legal oversight based on its 1953 Easement Agreement with Enbridge's predecessor. Our concerns extend beyond this 4.1 mile segment to all of Line 5 where a catastrophic spill will cause irreconcilable damage across northern lakes Michigan and Huron.

#### **49 U.S.C. §194 - Response Plans for Onshore Pipelines**

This legislation prescribes requirements for pipeline operators to develop oil spill response plans to mitigate substantial harm to the environment by discharging oil into or on any navigable waters of the United States or adjoining shorelines.

This legislation defines the requirement for response plans to explicitly address adverse weather conditions, including ice conditions, temperature ranges, weather-related visibility, significant wave heights and current velocities to insure that an oil spill can be contained and removed and that ecological damages can be remediated. The northern Great Lakes, including the Straits of Mackinac, typically undergoes dramatic weather changes for at least 6 months of every year that can affect the operational readiness of any response plan. Enbridge's failure to adequately address these factors is discussed later in this document.

The Enbridge Contingency Plan states *"Each operator shall submit a statement with its response plan, as required by §§194.107 and 194.113, identifying which line sections in a response zone can be expected to cause significant and substantial harm to the environment in the event of a discharge of oil into or on the navigable waters or adjoining shorelines<sup>1</sup>"* and designates that this information is contained in Annexes 1.5, 1.9 and 3.1. Unfortunately, Annexes 1.9 and 3.1 are completely redacted restricting the public's right to know whether Enbridge is compliant with this legal requirement. The Environmental Sensitivity Atlas produced by the U.S. Environmental Protection Agency in reduced spatial detail for use by first responders is the basis of this information and is publically accessible. **Enbridge's redaction of this information is not justifiable.** PHMSA should require that Line 5 be designated as an area of "significant and substantial harm to the environment" in the Contingency Plan.

Section 60109(a) of 49 U.S.C. defines "Imminent Hazard" as the existence of a condition related to pipelines or pipeline operations that present a substantial likelihood that death, serious illness, severe personal injury, or substantial endangerment to health, property, or the environment may occur." Nowhere in Enbridge's Contingency Plan do they recognize the imminent hazard of transportation of hazardous liquids through Line 5.

Part 194 defines "High Volume Areas" as "an area which an oil pipeline having a nominal outside diameter of 20 inches (508 millimeters) or more crosses a major river or other navigable waters, which, because of the velocity of the river, would require a more rapid response in case of a worst case discharge."

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<sup>1</sup> Enbridge Integrated Contingency Plan for the Superior Region (#866) Response Zone, Annex 4, p. 3

The Enbridge Contingency Plan indicates that they can respond within 54 hours to a Tier 3 incident.<sup>2</sup> **Any discharge of oil into the Great Lakes should be considered a Tier 3 incident.** This is clearly an unacceptable response time for any major spill into northern Lake Michigan or the Straits of Mackinac, considering the transient times identified in recent University of Michigan oil spill dispersion hydrodynamic modeling. **This condition is a major violation of Part 194.** All response times are now redacted in Enbridge's Version 3 of the subject response plan. One would conclude that this is an attempt to obscure facts about their inability to mobilize equipment and personnel to contain a spill of considerable size into Great Lakes waters. Redaction of information is rampant throughout the Contingency Plan without strong rationale for this level of increased security.

§194 also defines "Maximum Extent Practicable" as *"the limits of available technology and the practical and technical limits on a pipeline operator in planning the response resources required to provide the onwater recovery capability and the shoreline protection and cleanup capability to conduct response activities for a worst case discharge from a pipeline in adverse weather."* This is a troublesome concept which Enbridge can use to justify its failures to pre-position necessary assets near high consequence areas along the route of Line 5, its failures to conduct adequate spill response exercises and its inadequate investment in training for first responders.

§194.7 - Operating restrictions and interim operation authorization - This section states *"(a) An operator of a pipeline for which a response plan is required under §194.101, may not handle, store, or transport oil in that pipeline unless the operator has submitted a response plan meeting the requirements of this part. (b) An operator must operate its onshore pipeline facilities in accordance with the applicable response plan. (c) The operator of a pipeline line section described in §194.103(c) may continue to operate the pipeline for two years after the date of submission of a response plan, pending approval or disapproval of that plan, only if the operator has submitted the certification required by §194.119(e)."*

When PHMSA decertifies the Enbridge Contingency Plan for Line 5 due to the shortcomings identified in this document, **Enbridge must restrict products shipped by Line 5 to natural gas liquids only** until the material violations of Part 147 are corrected.

### **33 U.S.C. §1251 et seq. (1972) - Water Pollution Control Act (Clean Water Act)**

The Clean Water Act (CWA) is very explicit by stating that *"(b)(1) The Congress hereby declares that it is the policy of the United States that there should be no discharges of oil or hazardous substances into or upon the navigable waters of the United States, adjoining shorelines, ..."*

The CWA identifies that *"The President shall, in accordance with the National Contingency Plan and any appropriate Area Contingency Plan, ensure effective and immediate removal of a discharge, and mitigation or prevention of a substantial threat of a discharge, of oil or a hazardous substance— (i) into or on the navigable waters; (ii) on the adjoining shorelines to the navigable waters; (iii) into or on the waters of the exclusive economic zone; or (iv) that may affect natural resources belonging to, appertaining to, or under the exclusive management*

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<sup>2</sup> Ibid, Annex 1, Facility & Locality Information, p. 43.

*authority of the United States. (B) In carrying out this paragraph, the President may— (i) remove or arrange for the removal of a discharge, and mitigate or prevent a substantial threat of a discharge, at any time; (ii) direct or monitor all Federal, State, and private actions to remove a discharge; ... “*

Furthermore, the CWA authorizes the federal government to exert command and control over any oil spill recovery effort, to levy penalties for spills and recover clean-up costs from the responsible party (Enbridge in the case of Line 5), and to determine whether the federal government would assume total control of an oil spill if substantial threats exist to public health or welfare. The CWA directs the federal government to assume oversight responsibility for protecting the Great Lakes from a massive oil spill catastrophe. **The federal government has both the statutory authority and the ethical responsibility to determine that Enbridge’s Contingency Plan for Line 5 violates specific legal requirements** as identified in this document.

### **Failure to Consider Line 5 Segments as “High Consequence Areas”**

Section 60109(a) of 49 U.S.C. defines “High-Consequence Areas.” It is unclear whether PHMSA or Enbridge have designated key stretches of Line 5 as “High-Consequence Areas” in accordance with Section 6 of PL 112-90. This information may be redacted from the publically accessible layers on the National Pipeline Mapping System. If so, why? The public has a right to know of the risk for operations of the line.

The 135-mile portion of Line 5 from Manistique to St. Ignace, under the Straits of Mackinac, down and across the Indian River, and onward to Wolverine, Michigan is clearly a high-consequence area. This stretch is critical for drinking water supplies to almost all coastal communities across northern lakes Michigan and Huron and homeowners along the Inland Route of Michigan. The area that Line 5 crosses also provides substantial ecological functions to the flora/fauna of the area, including a large track of critical fishery environment. **If these areas are not designated as High-Consequence Areas, PHMSA must rectify this oversight** and require Enbridge to enhance its oil spill response and recovery capabilities accordingly.

The Enbridge Contingency Plan states: *“The High Consequence Areas (“HCAs”) and Unusually Sensitive Areas (“USAs”) that are detailed and defined for this Plan are an integral part of the Enbridge Superior Response Zone for emergency response. Due to the magnitude of the mapping involved the Enbridge Superior Region HCA Mapbook has been compressed into electronic media, and is accessible through regional offices.”*<sup>3</sup> If these areas are actually designated and mapped according to Enbridge’s claim, why are they not in the public domain?

### **Failure to Prove that Contingency Plan is Implementable**

#### Enbridge 2013 Certification Indefensible

Based on the DOT/PHMSA criteria, Enbridge Line 5 is considered to be a system of “Significant and Substantial Harm.” The Enbridge Superior Region Zone Contingency Plan states that

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<sup>3</sup> Enbridge Integrated Contingency Plan Superior Region (#866) Response Zone, Annex 3.0

*“Enbridge certifies to ... PHMSA ... that we have obtained, by contract or other approved means, the necessary private personnel and equipment to respond, to the maximum extent practicable, to a worst case discharge.”<sup>4</sup> This statement cannot be substantiated by facts.* Enbridge claims that the Integrated Contingency Plan covering Line 5 operations underwent extensive, first-ever PHMSA coordinated peer review before being approved in July 2013. This is more hyperbole than fact.

### Manpower and Equipment Mobilization Implausible

PHMSA should never have approved the Enbridge Contingency Plan with the lack of detail on equipment and personnel that can be mobilized in the first 12 hours after an incident occurs. This is a time for immediate response, considering ice conditions, variable currents and heavy waves that frequently occur over northern Lakes Michigan and Huron.

### **Worst Case Scenario Grossly Underestimated**

49CFR§194 states that a “Worst Case Discharge” is *“the largest foreseeable discharge of oil, including a discharge from fire or explosion, in adverse weather conditions. This volume will be determined by each pipeline operator for each response zone and is calculated in accordance to §194.105.”*

Enbridge’s Contingency Plan states: *“Each operator shall determine the worst-case discharge for each of its response zones and provide the methodology, including calculations, used to arrive at the volume<sup>5</sup>”* with detailed information available in Core 1.2.2 - Glossary WCD & Annex 1.9. The Enbridge Contingency Plan also states: *“Each response plan must plan for resources for responding, to the maximum extent practicable, to a worst-case discharge, and to a substantial threat of such a discharge”* with detailed information included in Annex 1.9, & 2.3 OSRO. Annex 1.9, covering local spill response equipment, is now fully redacted in Enbridge’s Version 3 of the response plan. One would conclude that this redaction is hiding a failure to pre-position necessary assets to contain and clean up a spill.

### Maximum Release from Michigan Upper Peninsula Segment Not Defined

A worst case spill scenario has not been made public for the Line 5 segment from Manistique to St. Ignace in the Upper Peninsula of Michigan which has been estimated to be 45,000 bbls or 10 times greater than the worst case for the Straits of Mackinac segment. The most environmentally sensitive area of this line segment is between the pumping stations of Manistique, Gould City, Naubinway and St. Ignace. This information must be publically announced; **the public has a right to question the risk to which it is exposed.**

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<sup>4</sup> Ibid, Annex 1, p. A1-4

<sup>5</sup> Ibid, Annex 4, p.3

### Maximum Release from Straits of Mackinac Segment Under Assessed

The worst case discharge described by Enbridge in numerous public meetings across the region is 4,500 bbls or 189,000 gallons of crude oil from the Straits of Mackinac segment of Line 5. This estimate is based on a fantasy that the pipeline can be shut down within 3 minutes of a detected significant drop in pressure. This estimate conflicts with Enbridge's own documentation to the Michigan Attorney General which nearly doubles this estimate.<sup>6</sup> This estimate also grossly underestimates what would happen if both 20" lines under the Straits of Mackinac were ruptured by an anchor dragging from a passing freighter which would increase the oil release up to 60,000 bbls.

Enbridge has repeatedly claimed that the Straits of Mackinac segment can be isolated within 3 minutes by remotely shutting of valves upstream and downstream of the Straits. This scenario does not reflect the reality that a Line 5 shutdown would require a cascade of individual shutdowns at each pumping station from Superior, Wisconsin to St. Ignace, Michigan and beyond. **PHMSA needs to reassess this worst case scenario and provide suitable rationale to the public.**

### Maximum Release from Michigan Lower Peninsula Segment Not Defined

A worst case spill scenario has not been made public for the Line 5 segment from Mackinaw City to Indian River in the Lower Peninsula of Michigan which has been estimated to be 45,000 bbls or 10 times greater than the worst case for the Straits of Mackinac segment. The most environmentally sensitive area of this line segment is in the proximity of Douglas, Burt and Mullet Lakes, the crossing of the Indian River and along the Pigeon River State Forest. This information must be announced; the public has a right to know the risk to which it is exposed.

### **Oil Dispersion Transport Inadequately Addressed**

#### Currents and Waves in the Great Lakes Exceeds Limits of Existing Control Techniques

The Enbridge Contingency Plan states: *"Current speed - Surface currents greater than 1 knot may cause boom failure or entrapment of oil beneath the boom when the boom is deployed perpendicular to the current. .... Boom can be deployed at varying angles as the current increases."*<sup>7</sup> Obviously, booms are going to be inoperable in the Straits of Mackinac for most of the time when storm movements are crossing the Great Lakes; there is also no mention of their effectiveness when surface currents vary as they normally do in the Straits. Analysis of 1990 buoy data for surface currents indicates that 30% of the time speeds exceed 1 knot and 5% of the time exceed 2 knots. As such, **boom deployments in the Straits of Mackinac are likely ineffectual for a significant portion of the year.**

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<sup>6</sup> Correspondence from Enbridge (Brad Shamlala) to Attorney General Bill Schuette and DEQ Director Dan Wyant, June 27, 2014, entitled "Enbridge Lakehead Systems Line 5 Pipelines at the Straits of Mackinac, p. 19

<sup>7</sup> Enbridge Integrated Contingency Plan Superior Region (#866) Response Zone, Version 2, Section 2.4.7.3



From published news articles, initial hydrodynamic model projections show that 6 hours after a release: *“The oil sheen has moved west into Lake Michigan toward the St. Helena Island Nature Preserve, but probably remains midway between the peninsulas. It hasn’t spread out much and is concentrated in a roughly 2-mile diameter circular patch which, based on currents, could potentially hit land anywhere between the Headlands Preserve on the Lower Peninsula and Straits State Park in the Upper Peninsula. Response to the spill is thus far limited to local crews using equipment already stashed onsite.”*<sup>8</sup>

Currently, only 2,000 feet of boom are prepositioned in the immediate Straits area, not the 30,000 feet necessary to contain a 2-mile diameter circular patch of oil. It is highly implausible that there are sufficient trained personnel and marine resources to deploy the meager 2,000 feet of pre-positioned boom within the first 6-hours of a release.

Analysis of wave information generated by the U.S. Army Corps of Engineers Waterways Experiment Station indicates that 37% of the time, waves in the Straits of Mackinac are 3 feet high or greater and 12% of the time waves in the area are 4 feet or higher. From a recent Detroit Free Press article: *“When you get above 3-, 4-, 5-foot seas — definitely at 5 feet — you are beyond where you can safely deploy these things [booms] and have them do any good,”* said Jerry Popiel, incident management adviser for the Coast Guard’s 9th District, which includes the Great Lakes.<sup>9</sup>

On Enbridge’s website describing the Michigan Technological University monitoring buoy deployed in the Straits of Mackinac, Jamey Anderson, coordinator of marine operations at Michigan Tech’s Great Lakes Research Center, states, *“The air temperature dropped 12 degrees inside of five minutes. The wind speed picked up from six or seven miles an hour to 35. The wind direction was all over the place, just swirling, really violent. And the wave heights went from less than one foot to six feet...all in the span of about 10 or 12 minutes.”* **This is an example of the unique weather and water conditions that occur in the Straits of Mackinac.**

#### Physical Dimensions of the Straits of Mackinac and Adjacent Great Lakes Exceed Limits of Existing Control Techniques

The Enbridge Contingency Plan states: *“Channel width – The width of a watercourse will determine if multiple sections of boom need to be installed. One method is cascading boom. Single boom deployments across wider channels have a greater chance of failing as current increases.”*<sup>10</sup> The width of the Straits is between 3.5 and 6 miles, so complete coverage is impossible. The quantity of booms needed to contain a spill is exponential to the spread of the oil spill. Within the first 6 hours of a spill, realistically 6 miles of boom would need to be deployed which is operationally impossible given current pre-positioning of booms, lack of vessels of opportunity on site and trained personnel on the ready.

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<sup>8</sup> “NOAA Graphics Show How a Mackinac Straits Oil Spill Might Look”, MLive article by Garret Ellison, 11/20/15

<sup>9</sup> “Oil spill, high waves: A Great Lakes disaster scenario”, Keith Matheny, Detroit Free Press, 12/6/15

<sup>10</sup> Enbridge Integrated Contingency Plan Superior Region (#866) Response Zone, Annex 3.0, Section 2.4.7.4

The Enbridge Contingency Plan states: “*Depths greater than 50 ft. (approximately 15 meters) can complicate hard boom anchor placement within the watercourse. Shoreline anchors or systems such as the Boom Vane may be more applicable. Depths less than 2 feet (approximately 0.5 meters) can preclude effective hard boom use. Sorbent booms, dams and filter fences may prove more effective.*”<sup>11</sup> The depth of water varies considerably across the Straits of Mackinac with some locations in excess of 250 feet.

The Enbridge Contingency Plan further states: “*Anchor points - Soft bottom substrates can complicate boom anchor placement.*”<sup>12</sup> A large portion of the Straits of Mackinac could impede anchoring due to bottom substrate and depths greater than 50 feet which makes anchoring extremely problematic. Boom anchoring has not been suitably tested in this area even during pre-planned exercises.

The Enbridge Contingency Plan states: “*Safety - High currents and winds, large obstacles, and other dangerous conditions could present safety hazards and preclude certain techniques.*”<sup>13</sup> - The Straits of Mackinac is an active commercial, recreational and fishery navigation zone. Commerce would have to be halted while clean-up operations are underway. None of these direct impacts are addressed in Enbridge’s Contingency Plan.

The Enbridge Contingency Plan states: “*All products shipped on the Enbridge system are floating oils, including dilbits and synbits. Enbridge acknowledges that, under certain environmental conditions, some fraction of oil released to a water body may become entrained in the water column, submerge or sink, in freshwater environments.*”<sup>14</sup> **Vertical mixing of oil with water will occur in the Straits of Mackinac where complex horizontal and vertical currents occur.** It is generally accepted that at best, only 30% of the crude is recovered after a spill and in the case of an accident in the Straits of Mackinac this low threshold would likely be impossible in this area.

The Enbridge Contingency Plan states: “*Oil conditions - Heavier oil conditions and larger areas may require more intrusive or mechanical methods, whereas lighter conditions may not require clean-up. For example - removing lighter oils in a marsh area or wetland may cause more harm to the environment than allowing for natural attenuation and biodegrading.*”<sup>15</sup> **This is a ridiculous premise - biodegrading will NEVER occur in freshwater systems**<sup>16</sup>.

The Enbridge Contingency Plan raises numerous other “red flags” including: “*Aquatic containment is primarily conducted through the use of oil spill containment booms.*”<sup>17</sup> This assessment is primarily based on riverine spills, not large bodies of water like the Straits of Mackinac. In addition, the Enbridge Contingency Plan states: “*Skimmers are usually the most*

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<sup>11</sup> Ibid, Section 2.4.7.4

<sup>12</sup> Ibid

<sup>13</sup> Ibid

<sup>14</sup> Ibid, Section 2.4.7.4 - Submerged Oil Content

<sup>15</sup> Ibid, Section 2.4.7.5 - Clean-up Technique Selection - Shoreline

<sup>16</sup> Biodegradation of Crude Oil Contaminating Marine Shorelines and Freshwater Wetlands, Albert D. Venosa and Xueqing Zhu, Spill Science & Technology Bulletin, Volume 8, Issue 2, April 2003, pp 163-178

<sup>17</sup> Enbridge Integrated Contingency Plan Superior Region (#866) Response Zone, Annex 3.0, Section 2.4.7



*efficient means of recovery of aquatic spills, although pumps, vacuum systems, and sorbents can also be effective, particularly in smaller waterways.<sup>18</sup>* The Straits of Mackinac and northern Lakes Michigan and Huron are not “smaller waterways.” It is also noted that at temperatures below freezing, most skimmers are difficult to operate; it is obvious that an oil spill in the Straits of Mackinac and adjacent waters would make the use of skimmers and similar equipment inadequate.

The Enbridge Contingency Plan states: *“Slick thickness - Recovery effectiveness with pumps/vacuum systems and skimmers decreases as slick thicknesses decline, becoming relatively ineffective for very thin slicks or sheens.<sup>19</sup>”* Most oil releases will dissipate quickly in the Straits of Mackinac which would eliminate the functionality of standard equipment.

### Containment and Clean-Up under Ice Conditions Abysmal

On Enbridge’s website “Winter Emergency Response”, they claim that *“an independent contractor with spill response expertise was commissioned in early 2015 to evaluate our capabilities to respond to a pipeline emergency during winter conditions.<sup>20</sup>”* There is no further mention of the results of this evaluation. In this same section of their website there is information on the equipment that either Enbridge, or their contractors, own that’s based in the Straits. This includes:

- *Remote Operated Vehicles (ROVs) that move below the surface of the ice, detect oil with sensors, and transport equipment below the surface to remove oil;*
- *Ice drills or augers that cut holes in the ice, so hoses and pumps can be used to suction oil;*
- *Arctic-specific water skimming equipment that can be used in both open-water and icy conditions;*
- *Specialized ice and fire boom, deployed to contain oil; and*
- *Vessels with water cannons that “herd” the oil to containment and collection areas.*

According to the Enbridge’s Contingency Plan Version 3 none of this equipment is listed at any of their response sites for the Superior Region, except for an ‘Ice Slotting Trailer’ located in Escanaba, 4-5 hours from the Straits of Mackinac. The equipment at this location for use under ice conditions is of minimal utility.

The International Tanker Owners Pollution Federation (ITOPF) makes some critically important statements about oil recovery in Arctic and cold climates:

### Oil Fate & Behavior in Icy Waters:

“Arctic conditions affect spilled oil fate and behavior in a number of ways, some aiding and some hindering our ability to respond. Standard oil spill fate and trajectory models

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<sup>18</sup> Ibid

<sup>19</sup> Ibid, Section 2.4.7.4

<sup>20</sup> Enbridge website:

[Enbridge.com/~media/Rebrand/Documents/Projects/line5/Safety\\_in\\_the\\_Straits\\_FS\\_Winter\\_Emerg\\_Response.pdf?la=en](http://enbridge.com/~media/Rebrand/Documents/Projects/line5/Safety_in_the_Straits_FS_Winter_Emerg_Response.pdf?la=en)

do not apply in icy waters. Oil trapped within or under fast ice is likely to remain relatively stationary as fast ice does not drift with surface currents or wind, and under-ice currents are minimal. In the highly dynamic pack ice zone however, oil drift may be considerable and unpredictable.”

Extreme cold – Oils will be more persistent – Reduces the rate of natural weathering processes such as evaporation and biodegradation; increases oil viscosity.

Pack Ice – Dampens wave energy and reduces natural dispersion and emulsification – Increased window of opportunity for chemical dispersion and in-situ burning.

Fast Ice – Oil may become encapsulated within or trapped underneath ice – Difficult to detect, track, and recover oil.

#### Containment & Recovery of Oil in Ice:

“Mechanical recovery of oil in ice is physically challenging. The presence of ice is likely to prevent the use of booms. The extreme cold meanwhile may hinder the operation of skimmers and pumps, and will increase the viscosity of spilled oil. “ “...The availability of suitable vessels and facilities for the storage and disposal of recovered oil will also be major considerations.”

“In-situ burning of oil is capable of removing large volumes of oil from the water surface with minimal waste generation. In the Arctic the minimum slick thickness required to sustain an efficient burn may be achieved by containment in ice. In Arctic conditions ignition or combustion aids may be required to start and sustain a burn.

Whilst experimental burns have reported oil removal efficiencies in excess of 90%, resultant tar-like residues with a tendency to sink may be produced. The toxicity and physical smothering impacts of such residues on Arctic flora and fauna have not yet been tested. In-situ burning is not a pre-approved technique for the Arctic, and it is likely that the dense smoke plume generated would restrict burns in close proximity to sensitive coastal resources.”

The Great Lakes Ice Atlas generated by the Great Lakes Environmental Research Laboratory of the National Oceanic and Atmospheric Administration showcases the climatology of ice conditions in the upper Great Lakes, including the Straits of Mackinac and northern Lakes Michigan and Huron. Review of this data indicates that on average there is ice cover in these areas for 4 months of the year. **Typically, ice cover is not solid, but rather shifting as atmospheric pressure systems cross the region making oil spill containment and clean-up under these situations near impossible.**

## **Mobilization of Physical Assets Inadequate**

### Containment and Removal Unproven and Untested in Great Lakes Open Waters

Enbridge claims that their Tactical Response Plan specific for the Straits of Mackinac adequately covers the unique needs of the area. This implies that the public should accept unsubstantiated assurances that a spill can be contained and cleaned up. PHMSA needs to critically reassess these documents, in conjunction with the U.S. Coast Guard (USCG) and the U.S. Environmental Protection Agency (USEPA), to assure the public that industry can be trusted.

### Oil Dispersion Exceeds Capabilities to Cascade Control and Recovery Equipment

Equipment needed to contain a spill in the Straits of Mackinac is sorely inadequate for reacting in a timely fashion. Enbridge has prepositioned 2,000 feet of containment boom in St. Ignace and Mackinac City, only 20% of the necessary boom for a “best case” spill that occurs when the Straits are ice-free and with low wind and wave conditions (otherwise referred to as Enbridge’s “worst case” spill for the area.)

The Enbridge Contingency Plan Annex Section 1.10 **Emergency Response Time is redacted from public review**. One would conclude that the operator is obscuring material flaws in their Contingency Plan. The redaction restricts the public’s right to know about the risk that they are exposed to and reduces their trust in industry to correct mistakes in a timely fashion.

The closest skimmer for a Straits of Mackinac spill is located in Escanaba, Michigan - a minimum of 4-5 hours away if immediately mobilized. Although equipment could be brought from other locations downstate in Michigan, it would still require at least 6-8 hours for mobilization.

One of the safety issues identified in the National Transportation Safety Board (NTSB) Accident Report for the Marshall, Michigan spill of July 25, 2010 was “... *the oil spill response contractors, identified in Enbridge’s facility response plan, were unable to immediately deploy to the rupture site and were over 10 hours away*<sup>21</sup>.” The Oil Spill Response Organization (OSRO) listed in the Superior region contingency plan is Marine Pollution Control Corporation located in Detroit, Michigan - at least 5-6 hours away from the Straits of Mackinac, if immediately mobilized.

Five days after the Emergency Response Protocol was initiated in Marshall, Michigan there was 36,055 feet of containment boom deployed, 30,840 feet of absorbent boom deployed, 79 vacuum trucks, 48 skimmers, 19 tanker trucks, 82 frac tanks, and 43 boats engaged. 453,600 gallons of oil/water had been transported to Griffith, Indiana and 1,386,000 gallons of oil/water was stored in frac tanks for future transport. The magnitude of similar deployment for a major spill in the Straits of Mackinac, along US-2 in the Upper Peninsula and within Cheboygan County in the Lower Peninsula is inadequately addressed in the existing Enbridge Contingency Plan.

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<sup>21</sup> National Transportation Safety Board Accident Report titled “Enbridge Incorporated Hazardous Liquid Pipeline Rupture Release, Marshall Michigan, July 25, 2010

## **Public Health Exposure to Spill Not Adequately Identified**

### Evacuation for Atmospheric Exposure from In-Situ Oil Burning Not Addressed

Section 1.8 of Annex 1 of the Enbridge Contingency Plan provides only a generic description on evacuation procedures to be employed in case of an oil spill. **This lack of pre-planning is endemic of the entire Enbridge Contingency Plan.** In the case of surface oil burning, a likely option during ice covered conditions on northern Lake Michigan and in the Straits of Mackinac, it is imperative that the Contingency Plan identifies locally available atmospheric monitoring equipment to protect the health of area residents. In-situ burning of an oil spill is totally overlooked in this Contingency Plan amplifying the need for PHMSA to de-certify it.

### Drinking Water Contamination in Affected Areas Not Addressed

In the counties affected by the Marshall, Michigan spill there was a ban on fishing, swimming, and boating. Water advisories were issued for private wells within 200 feet of the edge of the affected river bank. The Enbridge Contingency Plan does not address the potential of a major oil spill in the counties of Mackinac, Schoolcraft, Emmet, and Cheboygan counties where 8,000-10,000 property owners with private wells could be directly affected. In addition, there are numerous coastal communities who take their drinking water from northern Lakes Michigan and Huron or from the Inland Route of Michigan. Not only would entire communities be affected, but many of the water treatment plants could become contaminated from an oil spill.

## **First Responder Training and Response Exercise Inadequate**

Enbridge's Emergency Response Exercise conducted in the Straits of Mackinac on September 24, 2015 provides a good deal of information to inform all about the paucity for needed emergency response. The scenario used for this exercise has little "real-world" validity as it is based on the assumption that oil releases are stopped within 3 minutes per Enbridge public relations myth and the response plan does not adequately address the complexity of currents, waves, water depth and ice conditions in the upper Great Lakes. Actual shutdown of the pipeline would not likely occur for at least 15 minutes to an hour for Enbridge's control system to be remotely activated.

The Spill Response Exercise held by Enbridge in September 2015 was the minimum necessary investment of time and resources on the part of industry. Real emergencies happen suddenly and are not planned months in advance. A massive response infrastructure – as was the case in September 2015 – is not in place or even planned in sufficient detail to effectively react in a timely fashion when a rupture occurs on Line 5 into the Straits of Mackinac and adjoining waters of Lakes Michigan and Huron.

According to a published news article for the hypothetical spill used in the September 2015 clean-up exercise: *"...surface oil floats around the Straits for a day before starting to beach along the Lower Peninsula. Mackinaw City [Michigan] functions as a kind of ground zero in the model, with the heaviest concentrations washing ashore on the western side of Bois Blanc Island*

*in Lake Huron 60 to 72 hours after release. Interestingly, the graphics show a greater overall impact on the Lower Peninsula than the Upper Peninsula, although during the exercise, crews mostly practice boom and skimmer deployment and wildlife protection near Point La Barbe west of St. Ignace [Michigan], with some open water practice near Round Island.<sup>22</sup>* Hence, the drill didn't include the areas that would be most affected, nor the personnel that would most likely be the first responders.

Furthermore, the U.S. Department of Transportation, in conjunction with the USCG and USEPA, should conduct unexpected spill response exercises. Pre-planned spill exercises do not showcase material weaknesses in spill recover operations, but rather are used more for their public relations benefit.

## **Conclusion**

A careful review of Enbridge's Integrated Contingency Plan for the Superior Region Response Zone and prior After Action Reports from recent Spill Exercises leads to the conclusion that **Enbridge is ill-prepared to contain and clean up an oil spill in the upper Great Lakes including the Straits of Mackinac.** PHMSA should never have certified the Enbridge Contingency Plan with its inherent shortcomings and oversights. This egregious situation must be corrected. A moratorium on crude oil shipments through Line 5 needs to be ordered until this situation is corrected.

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<sup>22</sup> "NOAA Graphics Show How a Mackinac Straits Oil Spill Might Look", Mlive article by Garret Ellison 11/20/15