Exhibit 3

RESPONSE TO COMMENTS

In the numbered sections set forth below, this Response to Comments addresses the following points raised by public comments on the proposed Modification:

- comments objecting to revised Paragraph 71.c, which concerns axial crack inspections and testing on Line 5's Dual Pipelines segments;
- comment relating to proposed Modification provisions applicable to "New Lakehead Pipelines" and "Replacement Segments";
- comment relating to the revised Consent Decree termination provision; and
- comments that do not relate to specific provisions of the proposed Modification.

1. Comments Objecting to Revised Paragraph 71.c, Which Concerns Axial Crack Inspections and Testing on Line 5's Dual Pipelines Segment

Several commenters oppose a provision in the proposed Modification specifying that Enbridge need not use In-Line Inspection ("ILI") tools to assess potential axial cracks on the Dual Pipelines segments of Line 5 until expiration of a period that corresponds to one-half of the estimated remaining fatigue life of the worst potential axial Crack feature that could have survived a 2017 hydrostatic pressure test on the Dual Pipelines.[1] *See* Exhibit 2, Comments 1-8.

The Modification resolves a potential disagreement between the Parties over the Consent Decree's inspection requirement for the Dual Pipelines. Absent approval of the proposed Modification, Enbridge would vigorously contest any assertion that the existing Consent Decree requires axial crack ILIs on the Dual Pipelines. As discussed below, disputed issues regarding the correct application of Consent Decree provisions would present some complex questions with uncertain outcomes. Moreover, for reasons noted below, requiring axial crack ILIs on the Dual Pipelines prior to expiration of the timeframe referenced in the proposed Modification will not enhance pipeline safety.

A. Summary of Comments

Although the proposed Modification indicates that the issue of whether the Consent Decree requires periodic evaluations of the Dual Pipelines to detect axially aligned cracks is disputed, ECF No. 33-1 at PageID.2255, none of the public comments on the proposed Modification evaluate the relevant Consent Decree language or offer any facts relating to the factual predicates for requiring ILIs under the Consent Decree. Rather, the comments appear to assume that axial crack ILIs are currently required on the Dual Pipelines, and commenters proceed from that assumption to object to what they characterize as a reduction of Consent Decree requirements. *See,* Exhibit 2, Comment 1 (reducing scrutiny by allowing ILI requirements to lapse makes no sense); Comment 2 (should be shutting down Line 5, not letting Enbridge skip inspections); Comment 3 (allowing fewer ILIs is a bad idea); Comment 4 (removing safety inspections is unacceptable); Comment 7 ("ILIs for axial aligned features

[1] The Dual Pipelines are a short segment of Lakehead System Line 5 that crosses the Straits of Mackinac. *See* Consent Decree, ¶ 67.

should be performed at least every 5 years as the current Decree stipulates"); Comment 8 (oppose removing requirements applicable to Line 5; favors immediate shut down of Line 5); and Comment 16 (should have more scrutiny not less). Most of the comments relating to this section of the proposed Modification do not specifically discuss axial crack ILIs, but a couple of comments expressly endorsed use of axial crack ILI tools on the Dual Pipelines. Thus, one comment correctly notes that pipeline integrity assessment technology includes devices known as "smart pigs" that can traverse the pipeline interior and have the "capability to check for axial cracking," and that comment urges that Enbridge be required to check for axial cracks at the same frequency applicable to the assessment of other cracks. *Id.*, Comment 4. Another commenter suggested that axial crack ILIs should be required on the Dual Pipelines every two to three years. *Id.*, Comment 16. One other commenter did not specifically address the preferred frequency of axial crack ILIs on the Dual Pipelines but did express a preference for obtaining the sort of feature-specific information provided by ILI technology instead of relying on hydrostatic pressure tests that provide a more "blanket" assessment of pipeline integrity without generating profiles of individual features that may be present. *Id.*, Comment 7. Apart from general references to the existence of ILI tools that are capable of checking for axial cracks, none of the comments discuss specific capabilities and limitations of currently available axial crack tools.[2] In addition, none of the comments discussed how axial crack tool limitations affect the ability of currently available axial crack ILI tools to identify any features on the Dual Pipelines that would meet Consent Decree criteria for repair or mitigation of potentially injurious features.[3]

None of the public comments provided any information contesting either the methodology or conclusions of a report on the 2017 hydrostatic pressure test on the Dual Pipelines by Kiefner and Associates, Inc. ("Kiefner Report"), which is referenced in the proposed Modification. ECF No. 33-1, at PageID.2256-2257.[4] Although commenters did not specifically challenge the Kiefner Report finding that the worst potential axial crack feature that

[2] One commenter cited general references supporting the importance of frequent monitoring of pipeline integrity and discussing the value of ILI tools used to assess corrosion features by measuring metal loss. Nothing in the proposed Modification in any way affects requirements relating to use of ILI tools for assessing corrosion features.

[3] Axial crack ILI tool limitations and the relevance of such limitations in assessing any potential axial cracks on the Dual Pipelines is discussed in more detail in subsection D of the response to comments on proposed revisions to Subparagraph 71.c of the Consent Decree, below.

[4] Although one commenter cited a report that characterized one studied hydrostatic pressure test as "destructive" in the sense that it resulted in changes to the internal structure of pipeline materials, the commenter did not provide any information regarding the potential impact that the test pressures achieved during the 2017 hydrostatic test would have on pipe having the characteristics of the Dual Pipelines. Nor did any of the commenters present facts challenging the conclusion of Independent Third Party ("ITP") experts who help monitor the work under the Consent Decree that the methodology in the Kiefner Report provides a reasonable estimate of the remaining fatigue life of the worst surviving potential axial crack feature on the Dual Pipelines. *Id.* at PageID.2257; *see also*, Attachment 1, Declaration of Marc Lamontagne (hereinafter "Lamontagne Dec."), at ¶¶ 17-22.

could have survived the 2017 hydrostatic pressure test would have an estimated fatigue life of at least 40.9 years, some commenters question the continuing relevance of the Kiefner Report conclusions in the wake of a 2018 incident in which an anchor struck the Dual Pipelines. *See, e.g.*, Exhibit 2, Comment 6 and Comment 7 (the 2017 hydrostatic test is now questionable because the Dual Pipelines are not in the same condition as they were in 2017).[5]

B. Overview of Current Consent Decree Provisions Relating to ILIs

As one part of a broad resolution of claims arising from two separate pipeline failures that resulted in discharges of oil, Section VII.D of the Consent Decree establishes an "In-line Inspection Based Spill Prevention Program." *See* ECF No. 14 at PageID.1597-1641. In general, that section of the Consent Decree provides for Enbridge to conduct periodic ILIs of all Lakehead System Pipelines in order to ensure timely identification and repair or mitigation of potentially injurious Crack features, Corrosion features and Geometric features that, left unaddressed, could ultimately lead to pipeline failures that could result in discharges of oil into waters of the United States. *Id*. However, rather than mandating use of specific ILI tools that must be used on each Lakehead System Pipeline, Paragraph 28 of the Consent Decree requires Enbridge to conduct ILIs using ILI tools that are "most appropriate for accurately detecting, characterizing and sizing all Crack features, Corrosion features, and Geometric features that are present or anticipated . . ." on the pipeline being inspected. *Id.*, at PageID.1598.

Other provisions of the Consent Decree establish general requirements governing the timing and frequency of periodic ILIs required under the Consent Decree. In the case of ILIs to assess Crack features present or anticipated on Lakehead System Pipelines, Paragraphs 65 and 66 of the Consent Decree limit the interval between successive ILIs to no more than (1) one-half of the shortest Remaining Life of any unrepaired Crack feature, or (2) five years, whichever is shorter. *See* ECF No. 14 at PageID.1641. Paragraphs 29 and 30 of the Consent Decree require Enbridge to develop and implement ILI schedules that are consistent with these reinspection interval requirements. Id., at PageID.1599.

Independent of generally applicable requirements governing ILI reinspection intervals, the Consent Decree establishes additional requirements applicable to ILIs on the Dual Pipelines of Line 5. The Consent Decree establishes specific deadlines for completing ILIs to evaluate circumferential Crack features, Corrosion features, and Geometric features on the Dual Pipelines. *Id.*, at PageID.1644-1645. With respect to assessment of axially aligned Crack features on the Dual Pipelines, the Consent Decree gave Enbridge the option either to complete an ILI or conduct a hydrostatic pressure test by a specified deadline. *Id.*, at PageID.1645.[6]

[5] The significance of the 2018 anchor strikes for conclusions about the fatigue life of potential axial cracks on the Dual Pipelines is discussed in subsection E of the response to comments on the proposed revisions to Subparagraph 71.c of the Consent Decree, below.

[6] The option to perform a hydrostatic pressure test in lieu of using an ILI tool to assess axially aligned cracks on the Dual Pipelines is consistent with the approach of applicable regulations of the Pipeline and Hazardous Materials Safety Administration ("PHMSA") in effect when the parties entered into the settlement. *See* 49 C.F.R. § 195.452(j)(5)(i)-(iv) (2016). Those regulations generally authorized operators of pipelines in high consequence areas to use a range of different methods – including use of ILI tools, hydrostatic pressure testing, and other methods

C History of ILIs on the Dual Pipelines

Enbridge has conducted regular inspections of the Dual Pipelines using ILI tools since at least 1998. Enbridge conducted at least 21 ILIs to evaluate Corrosion features, Geometric features and circumferential Cracks features on the Dual Pipelines prior to May of 2016. Attachment 1, Lamontagne Dec., at ¶ 11. Since April of 2017, Enbridge has conducted at least 46 more ILIs to evaluate such features on the Dual Pipelines. *Id.* at ¶ 9 and Tables 1 and 2.

Although Enbridge has conducted frequent ILIs on the Dual Pipelines, it has never used an ILI tool to assess potential axial cracks on the Dual Pipelines. *Id.* at ¶ 12. Following entry of the Consent Decree, Enbridge exercised an option under Paragraph 71.b of the Consent Decree to conduct a hydrostatic pressure test of each leg of the Dual Pipelines, in lieu of using an ILI tool to assess potential axially aligned cracks on the Dual Pipelines as provided in Paragraph 71.a of the Consent Decree. *Id.*, at ¶ 14; ECF No. 14, at PageID.1645. Enbridge completed hydrostatic pressure testing of the Dual Pipelines pursuant to Paragraph 71.b of the Consent Decree in June of 2017. *Id.*

D. Contested Issues Regarding Use of ILIs to Assess Axial Cracks on the Dual Pipelines

As discussed briefly in this Section, the question of whether the Consent Decree requires axial crack ILIs are required on the Dual Pipelines presents some complex, unresolved issues on which the parties have divergent views. While the parties could seek judicial resolution of such issues through the Consent Decree's dispute resolution procedures, the United States sees no significant benefit from such an expenditure of resources by the parties or the Court because, as discussed in Section E, below: (1) it is apparent that currently available ILI tools are unable to identify axial crack features having depths that pose threats to the thick-walled pipe used to construct the Dual Pipelines, and (2) there is substantial basis to conclude that any axial cracks that could be present on the Dual Pipelines would not pose any threat for several decades, so any near term requirement to conduct axial crack ILIs would not materially reduce pipeline leak or rupture threats. For this reason, the proposed Modification reasonably compromises an otherwise disputed claim by deferring any axial crack ILIs on the Dual Pipelines during the period covered by the Modification.

Although Enbridge regularly performed axial crack ILIs on most Lakehead System Pipeline segments covered by the Consent Decree,[7] it has consistently argued that axial crack ILIs are neither appropriate for the Dual Pipelines nor required for that segment of Line 5 under the Consent Decree. In considering application of existing Consent Decree requirements to the Dual Pipelines, it became apparent that the Parties have divergent views regarding the best interpretation of various provisions of the Consent Decree, including:

- whether the option under Paragraph 71 of the Consent Decree to perform a hydrostatic pressure test on the Dual Pipelines in

– to assess pipeline integrity. In the case of pipelines that are deemed "susceptible to cracks," PHMSA regulations currently mandate use of ILI tools capable of detecting cracks as part of the integrity assessment process. 49 C.F.R. § 195.452(j)(5)(i) (2023).

[7] Attachment 1, Lamontagne Dec., at ¶ 13.

2017 in lieu of an conducting an axial crack ILI on that segment reflects an understanding that followup axial crack ILIs are not appropriate on the Dual Pipelines;

- whether axial cracks are "present" or "anticipated" on the Dual Pipelines within the meaning of Paragraph 28 of the Consent Decree, which provides for periodic ILIs of Lakehead System pipelines using ILI tools that are the most appropriate for detecting, characterizing and sizing Crack features, Corrosion features, and Geometric features that are present or anticipated on the particular pipeline;
- whether the five-year inspection interval referred to in Paragraph 66 has any relevance to the timing of an initial axial crack ILI on the Dual Pipelines, assuming such an ILI is required.

As an initial matter, the United States does not agree that the generally applicable ILI provisions in Paragraph 28 of the Consent Decree are in any way qualified by separate Consent Decree provisions in Paragraph 71 establishing a 2017 deadline for Enbridge to complete either an axial crack ILI or a hydrostatic pressure test of the Dual Pipelines. While the United States is confident of its position with respect to the relationship between provisions in Paragraphs 28 and 71 of the Consent Decree, the question is not entirely free of litigation risk.

Similarly, whether Paragraph 28 of the Consent Decree would require axial crack ILIs on the Dual Pipelines presents some complex issues that would have uncertain outcomes if presented to the Court for resolution. Among other things, Enbridge maintains that the Dual Pipelines are not susceptible to the development and growth of fatigue cracks and that there is no basis to conclude that axially aligned fatigue cracks are "present" or "anticipated" on the Dual Pipelines within the meaning of Paragraph 28.[8] Given the low operating pressures on the Dual Pipelines relative to the Specified Minimum Yield Strength ("SMYS") of the pipe used to construct the Dual Pipelines, the ITP concurred that it would not anticipate growth of any axially aligned fatigue cracks that might be present on the Dual Pipelines, which are subject to an Established Maximum Operating Pressure of 600 psi, which corresponds to 24.6% of SMYS, and which typically operates at pressures well below the Established Maximum Operating Pressure. ECF 33-1 at PageID.2257; *and see* Attachment 1, Lamontagne Dec., at ¶ ¶ 8, 17-24. Thus, any effort to require ILIs to assess axially aligned fatigue cracks on the Dual Pipelines at this time would likely present substantial litigation risk. Notably, none of the public comments presented information indicating that any axially aligned cracks are present on the Dual Pipelines, and none of the comments offered an explanation regarding why such would be anticipated on the Dual Pipelines.

[8] In addition to questioning whether there is a basis for concluding that axially aligned cracks are present or anticipated on the Dual Pipelines, Enbridge separately raised an issue about the ability of axial crack ILI tools to accurately size crack features on the Dual Pipelines if any such features were present. See discussion below at pp. 6 -9. Further, Enbridge has questioned whether the inspection interval provisions in Paragraph 66 of the Consent Decree are relevant in situations where a particular type of ILI has not previously been performed in a pipeline segment.

Significantly, however, Paragraph 28 of the Consent Decree is not by its terms limited to use of ILIs to assess fatigue cracks. Rather, Paragraph 28 broadly provides for assessment of "Crack features." As defined in Paragraph 10.l of the Consent Decree, the term "Crack feature" is not limited to fatigue cracking but includes "any crack or crack-like feature on the pipeline, whether the Feature Type is classified as crack-like, crack field, notch-like, surface-breaking lamination, linear indication, seam-weld manufacturing anomaly, hook cracks, or any other label denoting a crack or cluster of cracks." ECF No. 14, at PageID.1581. While the United States does not currently have information demonstrating that other types of cracks are present or anticipated on the Dual Pipelines, the United States believes it would be premature to conclude that such information could not be developed in discovery, absent an agreed resolution of issues relating to axial crack ILIs on the Dual Pipelines. Thus, both parties would confront litigation risk on that threshold issue.

In any event, the United States has concluded that requiring axial crack ILIs on the Dual Pipelines at this time would provide little or no useful information regarding characteristics of any potential axial cracks on the Dual Pipelines, given limitations of currently available axial crack ILI tools, and given currently available information indicating that any potential axial cracks present on the Dual Pipelines would not present threats for a very long time. In addition, use of axial crack ILI tools on the Dual Pipelines could lead to imposition of pressure restrictions that could impair operability of Line 5, ECF 33-1 at PageID.2258.

E. Given Characteristics of the Dual Pipelines, Axial Crack ILI Tools Would Be Ineffective in Identifying Crack Features Requiring Repair Or Mitigation Under The Consent Decree

The purpose of ILI inspection requirements under the Consent Decree is to provide information needed to determine whether Lakehead System Pipelines contain any features that meet "dig selection criteria" used to identify features that require repair or mitigation in accordance with timetables established in the Consent Decree. *See, e.g.*, ECF No. 14, at PageID.1604 (Consent Decree, ¶¶ 35-36). However, currently available tools for assessment of axial cracks would provide little or no information that would be of value in identifying features on the Dual Pipelines that meet Consent Decree dig selection criteria established for Crack features. Attachment 1, Lamontagne Dec., ¶¶ 25-30.

Although ILI tools are designed to detect and provide information about individual features present on pipelines, as correctly observed by one commenter, Exhibit 2, Comment 7, it does not follow that information provided by ILI tools always provides a superior basis for determining whether individual features present on pipelines pose a pipeline integrity threat that could lead to a leak or rupture, as the comment appears to assume. *Id.* ILI tools are subject to various performance specifications that affect both the probability that the tool can detect particular features and the accuracy of feature sizing measurements provided by the tool. Attachment 1, Lamontagne Dec., at ¶ 25. In the case of ILI tools used to assess axially aligned cracks, tool performance specifications include limitations on the maximum depth of cracks that the tool can accurately identify, sometimes referred to as a "maximum depth reporting standard" or a "depth sizing limit." *Id.* ILI tools currently used for assessment of axially aligned cracks in heavy walled pipe like the seamless pipe used to construct portions of the Dual Pipelines in the Straits of Mackinac have a maximum reported depth specification ranging between 3.0 and 4.0

mm. *Id.*[9] Any detected feature that is beyond depth sizing limit of the axial crack tool would have a saturated signal, which does not reflect the actual depth of the feature and cannot be used to determine the Predicted Burst Pressure or Remaining Life of the feature for purposes of applying Consent Decree dig selection criteria based on Predicted Burst Pressure or Remaining Life. *Id.*, at ¶ 27.

In the context of the thick-walled seamless pipe present within the Straits of Mackinac, the 3.0 mm to 4.0 mm depth sizing limit is reached at a relatively shallow 15% to 20% of the pipe wall thickness. However, as explained in the Lamontagne Declaration, any axial crack features within this depth sizing limit would not satisfy Consent Decree criteria for excavation and repair based on the feature's Predicted Burst Pressure or Remaining Life. *Id.*, ¶¶ 28, 29 and Figure 3 (depth sizing limit of axial crack tool is reached well before the point of detecting features with attributes sufficient to trigger burst pressure based dig selection criteria under Consent Decree), and ¶ 30 and Figure 4 (any axial crack surviving the 2017 hydrostatic pressure test would have a remaining life greater than 200 years – far in excess of Consent Decree dig selection criteria based on Remaining Life).

To reach this conclusion, Mr. Lamontagne first used the CorLas® software referenced in Appendix B of the Consent Decree (relating to Predicted Burst Pressure calculations) to identify dimensions that any potential axial crack features in the Straits would need to have in order to reach a bursting point at different operating pressures (critical crack dimension). *Id.*, at ¶ 29. In Figure 3 of his declaration, Mr. Lamontagne plotted the critical dimensions required for an axial crack to burst at 750 psi, a pressure which corresponds to the most stringent burst pressure-based dig selection criteria in the Consent Decree, and at 1200 psi, the pressure that the Dual Pipelines were subjected to during the 2017 hydrostatic pressure tests. *Id.*, at Figure 3. Figure 3 shows that the deepest crack features that the axial ILI tool is capable of detecting on the Dual Pipelines have depths far shallower than any axial crack feature that would meet Consent Decree dig selection criteria based on Predicted Burst Pressure. Consequently, any axial crack ILI tool run on the Dual Pipelines would not identify features that would trigger excavation and repair requirements under the Consent Decree. Figure 3 also shows that the 2017 hydrostatic test pressure was sufficiently high that it would have resulted in failure of any crack features having dimensions sufficient to meet Consent Decree dig selection criteria based on Predicted Burst Pressure. Thus, apart from the inability of the axial crack tool to identify any crack features that pose potential burst threats, there is independent reason to believe such axial crack features would not be present on the Dual Pipelines. *Id.*

As noted above, the Kiefner Report evaluated the remaining life of the worst surviving axial crack feature that could have been present on the Dual Pipelines after the 2017 hydrostatic pressure test. The Kiefner Report conservatively estimated that the shortest remaining life of any surviving axial crack feature is at least 40.9 years, and more than 110 years on portions of the seamless pipe in the Straits crossing. Attachment 1, Lamontagne Dec., at ¶¶ 19 – 20. Mr. Lamontagne reviewed the methodology used in the Kiefner Report analysis and verified the

[9] There is an advanced axial crack ILI tool with "enhanced sizing" capability that supports axial crack depth sizing for features deeper than 4.0 mm, but this enhanced sizing capability is only applicable to pipes having a wall thickness of 0.51 inches – substantially less than the thickness of the Dual Pipelines (0.812 inches). *Id.*, at ¶ 26.

Kiefner Report estimates by using an alternative software to independently evaluate the remaining life of crack features that could have survived the 2017 hydrostated test pressure. The remaining life estimates in the Kiefner Report and Mr. Lamontagne's analysis both substantially exceed the five-year remaining life period that would trigger excavation and repair requirements under the Consent Decree.[10] Mr. Lamontagne's analysis indicated that the Kiefner Report remaining life estimates are conservative, and he concurred with the conclusions of the Kiefner Report. *Id.*, at ¶ 22 and Figure 2.

Finally, the Consent Decree does include one dig selection criterion for any feature that ILI tools assessing Crack features identify as having a saturated signal. Saturated signal cracks are indications detected by ILI tools that are deeper that the tool's depth sizing limit. *Id.*, at ¶ 27. In the case of saturated signal features, the ILI tool does not provide sufficient information to accurately characterize the feature or determine its depth, *id.*, for purposes of completing assessments of Predicted Burst Pressure or Remaining Life in accordance with the Consent Decree. *See* ECF 14, ¶¶ 42, 60, and Appendix B (depth of feature input needed for Predicted Burst Pressure calculation; Remaining Life determination includes assessment of Predicted Burst Pressure).[11] Thus, in a typical case, where hydrostatic pressure testing is not a routine part of the integrity assessment process required under the Consent Decree, the saturated signal dig selection criteria serves to address an indeterminate risk identified by the ILI tool. However, in the case of the Dual Pipelines segment, the hydrostatic pressure test conducted in 2017 does provide information useful in evaluating risks that might be associated with any saturated signal features that conceivably could be detected if an axial crack ILI were performed on the Dual Pipelines. The previously discussed analysis by Mr. Lamontagne shows that: (1) the ILI tool signal saturation threshold is far below the minimum feature depth required to present a burst threat, so any saturated signal indications found by the ILI tool could include features that would not present actual threats,[12] and (2) any saturated signal features with actual depths sufficient to

[10] The Consent Decree also includes one dig selection criterion that requires excavation and repair of features with a Remaining Life that is less than two times the planned re-inspection interval. In this case, where Enbridge disputes any requirement for axial crack ILIs on the Dual Pipelines, no reinspection interval has been established for axial cracks on the Dual Pipelines. However, in cases where ILIs are performed under the Consent Decree, a five-year period is established in Paragraph 66 of the Consent Decree as the outer limit for reinspection intervals. In such cases, the Remaining Life dig selection criteria based on the required reinspection interval could include any feature having a Remaining Life under 10 years. Under either the Kiefner Report analysis or the analysis by Mr. Lamontagne, any potential axial crack feature surviving the 2017 hydrostatic pressure test would have a Remaining Life far in excess of 10 years.

[11] Thus, in the case of saturated signal crack features , the ILI tool does not provide actionable, feature-specific data of the kind that one commenter deemed preferable to hydrostatic pressure testing integrity demonstrations. Exhibit 2, Comment 7; Attachment 1, Lamontagne Dec., at ¶ 27.

[12] *Cf.* ECF 33-1, at Page ID.2257 (noting that axial crack ILIs could result in identifying features that do not pose threats to the integrity of the Dual Pipelines as Features Requiring Excavation).

present a burst threat would not have survived the 2017 hydrostatic pressure test. Attachment 1, Lamontagne Dec., Figure 3.

One commenter mistakenly interpreted the proposed Modification as suggesting that it is possible to differentiate among saturated signal features in a way that would allow Consent Decree requirements for repair or mitigation and pressure restrictions to exclude benign features and focus on an identified subset of saturated signal features that pose threats to pipeline integrity. Exhibit 2, Comment 7. That commenter questioned "the decision-making process for the proposed change to the Decree," arguing that the government should not revise requirements relating to axial crack ILIs on the Dual Pipelines simply "because potential axial aligned features identified by an ILI could include features that do not pose a material threat to the integrity of the pipeline . . . [or] cause an unnecessary reduction in pipeline pressure." Exhibit 2, Comment 7. This comment misapprehends the basis for the proposed modification of Paragraph 71 of the Consent Decree. As an initial matter, as discussed in Attachment 1, the Lamontagne Dec., at ¶ 27, ILI data regarding saturated signal features does *not* provide sufficient feature-specific depth information to support feature-specific risk determinations under the Consent Decree. For that reason, commenter's suggestion that the Modification should be revised to mandate current axial crack ILIs on the Dual Pipelines but to limit application of dig selection criteria to exclude features that ILI data shows to be benign is not possible.[13] Second, contrary to the commenter's assumption, the proposed modification of Paragraph 71 does not reflect a premise that the mere fact that an ILI results in repair or mitigation of benign features in itself provides a basis for suspending or eliminating use of particular types of ILIs. Rather, as discussed above, the conclusion that any saturated signal crack feature on the Dual Pipelines would not pose a risk of pipeline failure is based on an analysis of information developed from the 2017 hydrostatic pressure test. *Id.*, Figure 3.

In the instant context, where there is an unresolved question about whether the Dual Pipelines are subject to *any* Consent Decree requirement to conduct axial crack ILIs, it is appropriate to consider limitations of these tools which adversely impact the quality of the information these tools provide with respect to the Dual Pipelines. As noted above, in the case of thick-walled pipe of the sort used to construct the Dual Pipelines, the maximum reported depth specification may be as low as 3.0 mm to 4.0 mm – a depth that would not pose a threat of pipeline failure.

A <u>2018 Incident Involving an Anchor Strike on the Dual Pipelines Does Not Undermine Previous Conclusions Regarding the Remaining Life of the Worst Potential Axial Crack Features that Could Be Present On the Dual Pipelines</u>

None of the public comments disputed the ITP's conclusion that the methodology applied in the Kiefner Report provides a reasonable estimate of the remaining fatigue life of the worst potential axial Crack feature that could have survived the test pressures that the Dual Pipelines were subjected to during the hydrostatic pressure test. ECF No. 33-1, at PageID.2257. However,

[13] While it is possible to use extrinsic information developed based on the 2017 hydrostatic pressure test to assess potential risks that could be associated with saturated signal features that the ILI tool cannot quantify, such an analysis, which was conducted by Marc Lamontagne, shows that **no** saturated signal feature that could have survived the 2017 hydrostatic pressure test, would present a burst threat that would trigger excavation and repair requirements under the Consent Decree. Attachment 1, Lamontagne Dec., at ¶ 29 and Figure 3.

some commenters questioned continued reliance on the Kiefner Report analysis since it preceded an April 1, 2018 incident in which a shipping vessel anchor struck both the east and west legs of the Dual Pipelines. *See*, Attachment 2 to Exhibit 3 (National Transportation Safety Board, Marine Accident Brief, Anchor Contact of Articulated Tug and Barge *Clyde S VanEnkevort/Erie Trader* with Underwater Cables and Pipelines).

An anchor strike incident in April 2018 resulted in what the National Transportation Safety Board characterized as "superficial damage" to the Dual Pipelines, *id.*, at p. 1. ILIs conducted on April 7, 2018 using a high resolution caliper tool identified two new geometric feature anomalies on a single pipe joint on the west leg of the Dual Pipelines and one new geometric anomaly feature on a single pipe joint on the east leg of the Dual Pipelines. Follow-up inspections of the Dual Pipelines with a remotely operated vehicle and by divers confirmed the presence of dent and scrape features, as well as damage to pipeline coating, in the anchor strike impact areas.[14]

Dents and other geometric features of the sort detected in the aftermath of the April 2018 anchor strike are governed by dig selection criteria in Table 4 of the Consent Decree. Nothing in the Consent Decree mandates that the detection of geometric features triggers any additional requirements for assessment of any axial crack features that could be present on pipelines or requirements for reassessing Remaining Life calculations applicable to any previously detected cracks. Nevertheless, following the April 1, 2018 anchor strike on the Dual Pipelines, Enbridge arranged to examine each of the areas impacted by the anchor strikes using exterior ultrasonic and magnetic particle technologies to determine whether crack-like features were present in the impact areas. *See* Lamontagne Dec., at ¶ 24. Given that the post-anchor strike external ultrasonic inspections found no Crack features in the areas affected by the anchor strikes, id., there is no basis to conclude that the 2018 anchor strike resulted in new Crack features or altered any potential existing Crack features on the Dual Pipelines. Consequently, there is no basis to conclude that a new hydrostatic pressure test is warranted, as suggested by one commenter, *see* Exhibit 2, Comment 7, and there is no information indicating that the Kiefner Report analysis Remaining Life of the worst potential axial Crack feature on the Dual Pipelines is outdated.

2. **Comment Relating to Provisions of the Proposed Modification Relating to New Lakehead Pipelines and Replacement Segments**

A single commenter discussed provisions in the proposed Modification relating to requirements applicable to New Lakehead Pipelines and Replacement Segments. Exhibit 2, Comment 15. First, that commenter expressed the view that Enbridge should be required to install pressure and temperature transducers/transmitters on Line 93, the pipeline that replaced Original U.S. Line 3. The comment expressed concern about the proposed Modification, based on commenter's impression that revised Paragraph 87 of the Consent Decree does not include any requirement for installation of such pressure and temperature sensing instrumentation on Line 93.

[14] Following a series of inspections of areas affected by the anchor strike, Enbridge repaired impacted areas. See Attachment 1, Lamontagne Dec., at ¶ 24.

The commenter's concern that Line 93 is not subject to temperature and pressure sensing instrumentation requirements is based on a misreading of the proposed Modification. The proposed Modification does not alter an existing Consent Decree mandate that New Lakehead Pipelines such as Line 93 must be equipped with temperature and pressure sensing instrumentation at locations specified in the Consent Decree.

The proposed Modification describes revisions to the text of Subparagraphs 87.a and 87.b, but it did not modify all portions of Paragraph 87. Unmodified text in portions of Paragraph 87 that precede revised Subparagraphs 87.a and 87.b, states, in part:

> In addition to the flowmeters required under Paragraph 85, each New Lakehead Pipeline and Replacement Segment shall include instrumentation for measuring temperature and pressure as described in Subparagraphs 87.a and 87.b below. . . .

When the proposed revised text of Subparagraphs 87.a and 87.b is considered in conjunction with the unmodified opening language of Paragraph 87, it is clear that the modified Consent Decree **will require** Line 93 to be equipped with temperature and pressure sensing instrumentation, as urged by the commenter. Line 93 is unquestionably a "New Lakehead Pipeline" as defined in the Consent Decree. ECF No. 33-1 at PageID.2260; *cf* ECF No. 14 at PageID.1652 (current definition of New Lakehead Pipeline specifically includes the pipeline replacing Original U.S. Line 3). Thus, the instrumentation requirements referred to in proposed revisions to Subparagraphs 87.a.(1)-(5) and 87.b.(1) and (2) are applicable to Line 93.

Finally, this same commenter agreed that the proposed Modification establishes reasonable deadlines in the proposed Modification for completing studies of alarm optimization thresholds on New Lakehead Pipelines and Replacement Segments. None of the other commenters challenged any aspect of the proposed Modification related to requirements for New Lakehead Pipelines or Replacement Segments.

3. Comment Relating to the Revised Termination Provision

The proposed Modification would revise Section XX of the Consent Decree to establish a "Partial Termination" mechanism that would allow for termination of specified obligations under the Consent Decree while other provisions of the Consent Decree would remain in effect until "Final Termination" of the Consent Decree. ECF No. 33-1 at PageID.2265 – 2275. Only one of the public comments specifically addressed proposed revisions to Section XX of the Consent Decree. Exhibit 2, Comment 15.

That comment does not criticize or oppose the Partial Termination concept or any details of the revised provisions – including (1) the list of obligations subject to Partial Termination and those obligations reserved for Final Termination, (2) the general contents of the reports required to support requests for Partial Termination and Final Termination, (3) provisions to reduce duplication between Termination Reports and required Semi-Annual Reports, and (4) provisions governing Termination-related disputes. Rather, with a limited exception discussed below, the commenter agrees that the provisions in revised Paragraph 204 (governing Partial Termination) and revised Paragraph 205 (governing Final Termination) are reasonable. *Id.*

Even though the proposed Modification incorporates the same substantive criteria for Termination as the Consent Decree currently in effect,[15] the commenter favors changing Termination criteria to require a longer continuous period of substantial compliance with Consent Decree provisions before Enbridge could seek Termination of Consent Decree obligations (either Partial or Final). Specifically, commenter expressed a preference for conditioning both Partial Termination and Final Termination on a demonstration of substantial compliance over 36 consecutive months rather than the 12-month period in the proposed Modification and the current Consent Decree. *Id.* As a related matter, commenter favors modifying provisions governing Termination Reports (both Partial and Final) to assure that Enbridge's reports provide information about any Consent Decree violations over the last 36 consecutive months, rather than the 12 consecutive month period required under the proposed Modification and the current Consent Decree. The commenter suggests that extending the minimum substantial compliance period would better account for the variability in demand, weather, and other factors that may impact Enbridge's operations over a period of years. *Id.*

While the comments express a preference for a 36-month substantial compliance period, the comments do not provide facts or considerations showing that the previously approved 12-month substantial compliance period is in any way inappropriate or inadequate. At this point, the Consent Decree has been in effect since May 23, 2017. Since entry of the Consent Decree, Enbridge has conducted hundreds of ILIs of Lakehead System Pipelines and performed follow up analysis required under the Consent Decree to identify and repair or mitigate Features Requiring Excavation. The United States and the ITP have devoted many thousands of hours to monitoring implementation of the Consent Decree over an extended period that reasonably reflects variability of dynamic conditions affecting pipeline operations. Based on this experience, the United States does not believe there is any basis to conclude that the previously-approved 12-month substantial compliance period is in any way inadequate or inappropriate.

4. **Comments that Do Not Relate to Specific Provisions of the Proposed Modification**

Several comments expressed concerns that do not relate to specific provisions of the proposed Modification. As discussed below, in many instances, such concerns involve issues that are essentially identical to points presented and considered as part of the public comment process prior to entry of the original Consent Decree or in connection with previous modifications of the Consent Decree.

A. Tribal Consultation

One commenter suggests that the government should have engaged in formal consultation with Indian tribes independently of the public notice and comment process required under 28 C.F.R. § 50.7. Exhibit 1, Comment 6. On two prior occasions in this action, the United

[15] *Cf.* ECF No. 33-1 at PageID.2265 (Partial Termination) and PageID.2271 (Final Termination) *with* ECF No. 14 at PageID 1724 (the proposed Modification and current Consent Decree both identify substantial compliance with Consent Decree requirements over 12 consecutive months as one of the conditions for Termination).

States received and responded to similar comments regarding tribal consultation. *See* ECF No. 9-4 at PageID.1233, and 1237-1238 (responding to comments submitted prior to entry of the Consent Decree – including a comment demanding consultation with Michigan 1836 Treaty Tribes, which includes the current commenter), *and see* ECF No. 20-5 at PageID.1921 (responding to comments on the Third Modification of Consent Decree, including a comment submitted by the current commenter).

As discussed in previous responses to comments on tribal consultation, settlements and agreed modifications of settlements fall outside the scope of government-to-government consultation pursuant to Executive Order 13175 (Consultation and Coordination with Indian Tribal Government). Under the Department of Justice Policy on Tribal Consultation approved by the Attorney General, it is the policy of the DOJ to engage in such consultations before adopting "policies" with tribal implications. DOJ Policy Statement 0300.01 (August 29, 2013), at p. 4.[16] The Policy Statement goes on to clarify that "policies" refers to:

> (1) regulations or regulatory policies; (2) proposed legislation; (3) decisions regarding whether to establish federal standards; and other policies for which the Department determines consultation is appropriate and practicable. The term "policies does not include matters that are the subject of investigation, anticipated or active litigation, or settlement negotiations.

Id.

Because the proposed Modification is the product of settlement negotiations in a filed civil action, the proposed Modification is outside the scope of policies concerning tribal consultation by the Department of Justice. Absence of consultation does not render the proposed Modification unfair, unreasonable, or inconsistent with applicable law.

B. Comments Urging Shutdown of Some or All of Line 5

Several comments urge shutdown of Line 5 in order to protect water resources of the Great Lakes. *See* Exhibit 2, Comments 5 (Line 5 itself is unacceptable to people who value the Great Lakes), 8 (characterizing Line 5 as a catastrophe waiting to happen and urging immediate shutdown of the pipeline), and 11. Although most comments broadly refer to shutdown of Line 5, some comments could be construed as focusing more narrowly on the segments of Line 5 that cross the Straits of Mackinac. *Id.*, Comments 12 (arguing for ending the perceived threat presented by the pipeline, while noting that there are alternatives to crossing the Great Lakes); and 13 (refers to stopping the flow of oil under one of the largest freshwater resources in the world).[17] Two commenters separately articulated concerns about continued reliance on fossil fuels and the contribution of fossil fuels to atmospheric pollution and climate change. Exhibit 2,

[16] DOJ Policy Statement 0300.01 (August 29, 2013) is available on-line at https://www.justice.gov/otj/consultation-policies

[17] One commenter presenting the opposing view that there is "zero reason" to shut down Line 5. *Id.*, Comment 9.

Comments 10 and 14. As discussed below, these comments are essentially identical to public comments received and addressed prior to entry of the original Consent Decree. *See* ECF No. 9-4 at PageID.1259-1262.[18]

The Consent Decree – and the proposed Modification currently before the Court – are intended to provide an appropriate resolution of the claims asserted in the complaint in this action, which arose from alleged unlawful discharges of oil into navigable waters of the United States and adjoining shorelines from two different Lakehead System Pipelines, known as Lines 6A and 6B.[19] To resolve the claims asserted in the complaint in this action, the Consent Decree:

- provides for assessment of a civil penalty in accordance with Section 311(b)(7) of the Clean Water Act, 33 U.S.C. § 1321(b)(7), *see* Section V of the Consent Decree, ECF No. 14 at PageID.1587-1589;
- provides for reimbursement of removal costs that the United States incurred in responding to discharges of oil from Line 6B, in accordance with Section 1002(b)(1) of the Oil Pollution Act, 33 U.S.C. § 2702(b)(1), *see* Section VI of the Consent Decree, *id.*, at PageID. 1589-1592; and
- provides for Enbridge to implement an extensive set of enhanced compliance measures on Lakehead System Pipelines to require conformance with the Clean Water Act's prohibition on discharges of oil in quantities determined to be harmful. *See* Section VI of the Consent Decree, *id.* at Page ID.1592-1703.

As explained in the response to previous comments on the Consent Decree,[20] the Consent Decree's enhanced compliance measures require steps designed to prevent or minimize pipeline failures that could result in leaks or ruptures. The United States continues to believe that the Consent Decree, with the clarifications and improvements implemented through the proposed Modification and prior modifications, includes appropriate measures to restrain violations and require compliance with the Clean Water Act Section 309(b), 33 U.S.C. § 1319(b). Although some commenters would clearly prefer broader requirements, such as a complete shutdown of Line 5, the commenters have not identified any specific deficiencies in the injunctive measures required under the Consent Decree or explained why those injunctive measures are not adequate to prevent pipeline failures that could result in discharges into the Great Lakes or other navigable waters of the United States. Nor have commenters provided any information documenting actual discharges from the Dual Pipelines or other portions of Line 5 that might warrant a more restrictive approach to assuring compliance with the Clean Water Act.

The United States does not dispute that a complete shutdown of Line 5 would reduce potential for prohibited discharges of oil from Line 5. However, it does not follow that the Clean

[18] In a similar vein, some comments on the Consent Decree favored shutdown of another Lakehead System Pipeline referred to as Original U.S. Line 3. ECF No. 9-4 at PageID.1256.

[19] Enbridge later replaced Line 6B with a pipeline known as Line 78.

[20] *See, e.g.*, ECF No. 9-4 at PageID.1254-1257.

Water Act mandates shutdowns as the exclusive means of preventing unlawful discharges from pipelines, or the most appropriate means of assuring compliance in most cases.

As explained in response to comments on the original Consent Decree, the United States typically would not seek to shut down commercial operations except in cases where the owner or operator of a regulated business either is unable to implement appropriate compliance measures or chooses to cease operations rather than incurring expenses needed to assure compliance. ECF No. 9-4, at PageID.1257. In the instant case, Enbridge has distinctly not agreed to shut down Line 5. On the contrary, as discussed below, in other litigation Enbridge is contesting actions that would require shutdown of Line 5. In the current context, the United States does not believe there is any basis for the Court to conclude that shutdown of Line 5 is an essential component of any Clean Water Act remedy that is adequate, reasonable and appropriate.

At least one advocate of shutting down Line 5 alludes to action by the State of Michigan to revoke the 1953 Easement authorizing the Dual Pipelines to occupy bottomlands in the Straits of Mackinac. Exhibit 2, Comment 10; *see also* Exhibit 2, Comment 6. Enbridge has challenged revocation of the easement and has continued operating Line 5 pending resolution of litigation regarding revocation of the 1953 easement. S*ee Enbridge v. Whitmer*, Case No. 1:20-cv-1141 (W.D. Mich.) and *Nessel v. Enbridge Energy*, Case No. 21-cv-01057 (W.D. Mich.) (interlocutory appeal relating to removal of action from state court pending before 6th Circuit).

Issues relating to the merits of the revocation of the 1953 easement are properly addressed in other proceedings. This Court does not need to resolve such issues to determine that the proposed Modification is adequate, reasonable and appropriate. The Consent Decree does not authorize Enbridge to operate Line 5 or any Lakehead System Pipeline in violation of any applicable legal requirements. On the contrary, Paragraph 192 of the Consent Decree expressly provides that "Enbridge is responsible for achieving and maintaining compliance with all applicable federal, State, and local laws, regulations, orders, and permits." ECF No. 14 at PageID.1720. The same provision explicitly confirms that the Consent Decree does not constitute a permit under any federal, State, or local laws or regulations. Finally, as pointed out in response to public comments submitted prior to approval of the original Consent Decree, there is nothing in the Consent Decree that mandates continued operation of Line 5. ECF No. 9-4 atPageID.1263. Thus, if another court made a final determination that the operation of Line 5 is unlawful, the proposed Modification would not provide any basis to continue operating Line 5.[21]

---

[21] Two commenters referred to pending litigation including a determination that portions of Line 5 are currently trespassing on parcels within the Bad River Indian Reservation in Wisconsin. Exhibit 2, Comment 3 and 6. In *Bad River Band of the Lake Superior Tribe of Chippewa Indians of the Bad River Reservation v. Enbridge Energy Company*, Civ. Action No. 19-cv-602-wmc (W.D. Wisc.), the Court concluded that Enbridge does not have valid easements on certain parcels within the Bad River Reservation, but the Court has not yet issued final orders determining the scope of injunctive remedies to address the trespass found by the Court. Nothing in Consent Decree would mandate continued operation of Line 5 in violation of any orders ultimately issued with the Western District of Wisconsin in the *Bad River* litigation, so this Court does not need to separately evaluate issues presented in that action in order to determine that the proposed Modification is reasonable, adequate or appropriate.

Finally, although some commenters cited concerns about the impact of continued reliance on fossil fuels on air quality and the impact of fossil fuels on climate change, such concerns are beyond the scope of this civil action and this Consent Decree. This case involves claims for injunctive relief under Section 309(b) of the Clean Water Act, 33 U.S.C. 1319(b), which authorizes Courts to restrain violations of, and require compliance with, specified provisions of the Clean Water Act, including the prohibition on discharges of harmful quantities of oil into navigable waters of the United States and adjoining shorelines. As discussed in response to previous public comments on the original Consent Decree, *see id.* at PageID.1253-1256, the Consent Decree (and subsequent modifications) appropriately focus on measures to prevent or minimize pipeline failures that could result in discharges to surface waters, as well as measures to support prompt and effective responses to any discharges that may occur. Relevant provisions of the Clean Water Act and the Oil Pollution Act do not confer broad authority to implement broad policy decisions that would override otherwise lawful oil transmission pipeline activities.

B. Comment Urging Additional Studies Relating to the Dual Pipelines

One commenter urges modifying the Consent Decree to require Enbridge (1) to conduct a structural analysis of the Dual Pipelines and screw anchor support system, and (2) to pay for collection and analysis of data relating to currents in the Straits of Mackinac, modelling of such currents, and evaluation of engineering stresses on the Dual Pipelines. Exhibit 2, Comment 16. Commenter suggests that additional studies are appropriate because scouring of the bed of the Straits since installation of the pipeline in 1953 has "radically changed" the original configuration of the Dual Pipelines, changing either the number, location, or length of unsupported spans where the Dual Pipelines are not in in contact with the lakebed. *Id.* Commenter also suggests that installation of screw anchor supports could have caused additional stresses in the pipeline. *Id.* Commenter speculates that the Dual Pipelines have not been subjected to engineering analyses that adequately reflect or account for the current configuration of the Dual Pipelines, though the comment does not purport to identify or critique engineering assessments that have been performed with respect to the Dual Pipelines.

As an initial matter, the United States notes that both the original Consent Decree and the Third Modification of the Consent Decree include provisions to address potential risks associated with unsupported spans – as does the 1953 easement that governs the Dual Pipelines in the Straits. Those provisions include, among other things, frequent visual inspections of the Dual Pipelines to monitor the development and growth of spans, as well as provisions requiring installation of screw anchors to limit the permissible length of unsupported spans before they reach the maximum length permitted under the 1953 easement. ECF No. 14, at PageID.1642, ECF No. 21, Page ID.1937-1940. Those provisions were previously approved by the Court following submission of public comments. ECF No. 14 and ECF No. 20. In addition, in connection with a required evaluation of biota on the Dual Pipelines, the Consent Decree required an evaluation of whether biomass present on unsupported spans of the Dual Pipelines present a threat to pipeline integrity due to either biomass weight or to pressure caused by currents or movement of ice around the biomass. ECF No. 14 at PageID.1643-1644. While this assessment may not have included all of the elements desired by commenter, it did take into account all of the changes to configuration of the pipeline between 1953 and entry of the Consent Decree.

Commenter does not suggest that there have been substantial changes to the configuration of the Dual Pipelines since approval of the original Consent Decree or the Third Modification. Moreover, although commenter believes that additional studies and data collection would be desirable, commenter does not contend that such assessments are legally mandated under either the Clean Water Act or under statutes and regulations administered by the Pipeline and Hazardous Materials Safety Administration.

While the parties might have reasonably agreed on a different injunctive program than the one previously presented to and approved by the Court, including provisions for various studies not included in the Consent Decree, the fact that the proposed Modification does not reopen previously-approved provisions of the Consent Decree to include studies and analysis of the kind desired by commenter does not indicate that any of the provisions of the proposed Modification lodged with the Court are inadequate, unreasonable or inappropriate.

Attachment 1

IN THE UNITED STATES DISTRICT COURT
FOR THE WESTERN DISTRICT OF MICHIGAN
SOUTHERN DIVISION

UNITED STATES OF AMERICA, *et al.*,	)	
Plaintiffs,	)	**Civil Action No. 1:16-cv-914**
v.	)	
	)	**Judge Gordon J. Quist**
ENBRIDGE ENERGY, LIMITED PARTNERSHIP, *et al.*,	)	
Defendants.	)	

DECLARATION OF MARC LAMONTAGNE

I, Marc Lamontagne, state as follows:

1. I am the Principal Engineer at Lamontagne Pipeline Assessment Corporation, which specializes in pipeline assessment consulting and evaluations, including, but not limited to: assessing the efficacy of data from In-Line Inspections (ILIs) to assess corrosion, cracking or other anomalies that may be present on pipelines; analysis of growth of anomalies detected on pipelines, including analysis of growth of crack features by fatigue or environmental factors; and fitness-for-service (FFS) evaluations of pipeline segments that have been hydrostatically pressure tested or examined using ILI tools. Lamontagne Pipeline Assessment Corporation has provided consulting services to various pipeline operating companies, governmental entities, including the Pipeline and Hazardous Materials Safety Administration within the United States Department of Transportation, insurance companies, and pipeline engineering consulting groups, both domestic and international.

2. I am a registered Professional Engineer in Ontario, Canada. I have a Bachelor of Engineering degree in Material Science from the University of Western Ontario, in London, Ontario, a Master of Applied Science degree from Queens University in Kingston, Ontario, and a Ph.D. in metallurgical engineering, also from Queens University in Kingston, Ontario. I have served on various pipeline industry consensus standards development committees, including the Canadian Standards Association, American Society of Mechanical Engineers B31.8, National Association of Corrosion Engineers Standards (Stress Corrosion Cracking and ILI – "State of the Art" documents), and have been involved with the Pipeline Research Council International (PRCI) for pipeline cracking and ILI studies.

3. I began working in pipeline integrity management in 1997, when I was employed by TransCanada Pipelines, and I have worked with energy pipeline ILI information of all types for the past 26 years, including some of the first crack ILIs performed in the 1990s. My employment history prior to formation of Lamontagne Pipeline Assessment Corporation also includes working as Manager of Integrity Engineering for Tuboscope/NDT Systems and Services, an ILI vendor that conducts ILIs for pipeline owners and operators. NDT Systems and Services is a precursor to NDT Global LLC, which has provided ILI services for various Lakehead System pipelines owned or operated by Enbridge Energy, LP and affiliated entities, including the Dual Pipelines segment of Line 5.

4. I have extensive experience conducting and/or reviewing assessments of pipeline cracks, including evaluation of hydrostatic pressure test design, in-operation acceptance, and root cause failure analysis. I have conducted numerous FFS determinations of various crack types, including manufacturing flaws, stress corrosion cracking and stress-induced cracks, using widely-accepted methodologies. I also have experience working with ILI vendors on technology verification and enhancements, as well as various ILI research and development programs relating to technological areas such as Electro Magnetic Acoustic Transducer, Eddy Current, and Shear Wave optimization.

5. In 2017, I was retained as a subject matter expert by O.B. Harris, LLC, the appointed Independent Third Party (ITP) under the Enbridge Consent Decree with the United States in the matter of *United States v. Enbridge Energy, Limited Partnership et al.*, Case No. 1:16-cv-00914 (W.D. Mich.) (the Consent Decree). The role of the ITP is to conduct a comprehensive verification of Enbridge's compliance with certain injunctive measures set forth under the Consent Decree. My role with the ITP includes, among other things, evaluation of Enbridge's compliance with various aspects of the In-Line Inspection Based Spill Prevention Program set forth in Section VII .D of the Consent Decree. My primary role has focused on reviewing approximately 260 ILI tool runs conducted on Lakehead System Pipelines in order to monitor compliance with the Consent Decree.

6. As part of my responsibilities as a subject matter expert for the ITP, I have reviewed ILI Reports setting forth data relating to ILI tool runs conducted pursuant to the Consent Decree, including ILIs conducted on a 4.09 mile segment of Line 5 that crosses the Straits of Mackinac (referred to in the Consent Decree as the "Dual Pipelines.")

7. In the course of carrying out my responsibilities as a subject matter expert for the ITP, I have also had access to, and reviewed relevant information in, various Enbridge databases, including the OneSource Database referred to in Paragraph 75 of the Consent Decree and a Pipeline Asset Database, which provides information about characteristics of various Enbridge pipeline segments, including Dual Pipelines.

Straits of Mackinac – Dual Pipelines

8. The Dual Pipelines transport approximately 540,000 barrels per day of light crude oil, light synthetic oil, and natural gas liquids (NGLs), including propane. At the Dual Pipelines segment, the product transported in Line 5 divides between two 20" outer

diameter (OD) pipelines, sometimes referred to as the East and West Mackinac Straits segments. Each 20" diameter segment is comprised of two types of pipe. The pipe used for the water crossing segments is Grade A (API X-30), 0.812" wall thickness, seamless pipe.[1] The seamless pipe has a Specified Minimum Yield Strength (SMYS) of 2436 psi. The buried, onshore segments are also comprised of approximately 250' of API X-52 grade, 0.500" wall thickness, High Frequency Electric Resistance Weld (HF-ERW) pipe installed in 2012. The established maximum operating pressure (MOP) for both the East and West segments of the Dual Pipelines is 600 psi, which corresponds to 24.6% of the SMYS for the seamless pipe.

In Line Inspections

9. In my capacity as a subject matter expert for the ITP, I reviewed ILIs that Enbridge has conducted on Lakehead System Pipelines pursuant to the Consent Decree, including ILIs on the Dual Pipelines, and I am also familiar with OneSource database records documenting certain ILIs conducted on the Dual Pipelines prior to the Effective Date of the Consent Decree. I compiled a list of the ILIs conducted on the Dual Pipelines between April of 2017 and May of 2022. Table 1 identifies ILIs conducted on the East Segment of the Dual Pipelines during that period, and Table 2 identifies ILIs conducted on the West segment of the Dual Pipelines during that period. Even though the 2017 ILIs were conducted just prior to the effective date of the Consent Decree, those inspections were included in the ITP purview.

Table 1
ILI Inspections in the East Segment of the Dual Pipelines

Run Date	Vendor	Tool	Technology Type	Technology Type
4/12/17	BH	GEMINICAL	CALIPER	Geometry
4/12/17	BH	GEMINIMFL	MFL	Corrosion
4/19/17	NDT	UCC	UTCD	Circumferential Crack
3/20/18	BH	GEOPIG	CALIPER	Geometry
3/20/18	GE	MFL3	MFL	Corrosion
4/07/18	BH	GEOPIG	CALIPER	Geometry
4/10/18	NDT	UCC	UTCD	Circumferential Crack
4/17/18	BH	GEMINICAL	CALIPER	Geometry
4/17/18	BH	GEMINIMFL	MFL	Corrosion
2/19/19	BHGE	GEOPIG	CALIPER	Geometry
Run Date	**Vendor**	**Tool**	**Technology Type**	**Technology Type**
3/06/19	NDT	UCC	UTCD	Circumferential Crack

[1] Enbridge OneSource, Pipeline Asset Database (last accessed Jan. 3, 2023).

Table 1 ILI Inspections in the East Segment of the Dual Pipelines				
3/13/19	BHGE	MFL3	MFL	Corrosion
1/14/20	BHGE	MFL4CAL	CALIPER	Geometry
1/14/20	BHGE	MFL4MFL	MFL	Corrosion
2/05/20	NDT	UCC	UTCD	Circumferential Crack
8/24/20	BHGE	MFL4CAL	CALIPER	Geometry
8/24/20	BHGE	MFL4MFL	MFL	Corrosion
1/19/21	NDT	UCC	UTCD	Circumferential Crack
5/26/21	BHGE	MFL4CAL	CALIPER	Geometry
5/26/21	BHGE	MFL4MFL	MFL	Corrosion
1/12/22	NDT	UCC	UTCD	Circumferential Crack
5/03/22	BHGE	MFL4CAL	CALIPER	Geometry
5/03/22	BHGE	MFL4MFL	MFL	Corrosion

Table 2 ILI Inspections in the West Segment of Dual Pipelines				
Run Date	**Vendor**	**Tool**	**Technology Type**	**Technology Type**
4/11/17	BH	GEMINICAL	CALIPER	Geometry
4/11/17	BH	GEMINIMFL	MFL	Corrosion
4/18/17	NDT	UCC	UTCD	Circumferential Crack
3/20/18	BH	GEOPIG	CALIPER	Geometry
3/21/18	GE	MFL3	MFL	Corrosion
4/07/18	BH	GEOPIG	CALIPER	Geometry
4/11/18	NDT	UCC	UTCD	Circumferential Crack
4/18/18	BH	GEMINICAL	CALIPER	Geometry
4/18/18	BH	GEMINIMFL	MFL	Corrosion
2/20/19	BHGE	GEOPIG	CALIPER	Geometry
3/07/19	NDT	UCC	UTCD	Circumferential Crack
3/14/19	BHGE	MFL3	MFL	Corrosion
1/17/20	BHGE	MFL4CAL	CALIPER	Geometry
1/17/20	BHGE	MFL4MFL	MFL	Corrosion
2/07/20	NDT	UCC	UTCD	Circumferential Crack
7/01/20	BHGE	MFL4CAL	CALIPER	Geometry
7/01/20	BHGE	MFL4MFL	MFL	Corrosion
1/20/21	NDT	UCC	UTCD	Circumferential Crack
5/27/21	BHGE	MFL4CAL	CALIPER	Geometry

Table 2 ILI Inspections in the West Segment of Dual Pipelines				
Run Date	Vendor	Tool	Technology Type	Technology Type
5/27/21	BHGE	MFL4MFL	MFL	Corrosion
1/11/22	NDT	UCC	UTCD	Circumferential Crack
5/06/22	BHGE	MFL4CAL	CALIPER	Geometry
5/06/22	BHGE	MFL4MFL	MFL	Corrosion

10. The high resolution MFL inspections cover the full pipe circumference to determine the location and size of metal loss (corrosion) features both internal and external. Combined on the same ILI tool are the geometry instrumentation that gathers information on pipe out-of-roundness, such as dents, diameter reductions and ovalities. The combination of these technologies on one vehicle provides high reliability in the identification of intersecting features, including features addressed in Table 5 of the Consent Decree. The combination tool also includes an Inertial Mapping Unit (IMU), which maps the three-dimensional orientation of the pipeline to examine for pipeline movement and bending strain, as well as further defining the location of anomalies identified by the metal loss and geometry technologies.

11. In addition to the ILI tool runs described in Tables 1 and 2, I am also familiar with at least 21 additional ILIs that Enbridge conducted on the Dual Pipelines between 1998 and 2016. Prior to assuming responsibilities as a subject matter expert for the ITP, I provided consulting services to the Pipeline and Hazardous Materials Safety Administration relating to ILIs conducted on the Dual Pipelines prior to 2017.

12. None of the Dual Pipeline ILIs referred to above were conducted using tools designed for assessing axially-aligned crack features. The UCc tool referenced in Tables 1 and 2 is an ultrasonic tool employing shear wave sensors to examine the full length and circumference of the pipeline in high resolution for circumferentially oriented crack-like anomalies. This tool examines for features, not only in the main pipe body, but in girth welds as well. Such UCc ILI tools are equipped with sensors that are similar to those used in tools designed for axial crack analysis, but the orientation of sensors in UCc tools is offset 90° compared to the orientation of sensors in ILI tools used for assessment of axially aligned cracks. Ultrasonic ILI tool sensor orientation that allows for the travel of the ultrasonic sound waves to be perpendicular to the circumferential crack's orientation facilitates greater reception of the ultrasonic response to circumferentially-oriented features. Thus, different sensor orientations are required for the most appropriate assessment of axial cracks and circumferential cracks.

13. Enbridge has periodically conducted axial crack ILIs on numerous Lakehead System pipeline segments that are constructed with thinner-walled pipe than the pipe used in the Dual Pipelines. Enbridge has conducted axial crack ILIs on one or more segments of Line 1, Line 2, former Line 3, Line 4, Line 5 (other than the Dual Pipelines segment),

Line 6A, Line 10, Line 14, Line 61, Line 62, Line 64, Line 65, Line 67, Line 78 (which replaced Line 6B), and Line 93 (which replaced Line 3).

Assessment of Axial Cracks on the Dual Pipelines by Hydrostatic Pressure Testing

14. In lieu of conducting axial crack ILIs on the Dual Pipelines, Enbridge conducted hydrostatic pressure testing of both the East and West segments of the Dual Pipelines, as authorized under Paragraph 71 of the Consent Decree. The hydrostatic pressure testing in the East and West Straits were completed on 6/16/2017 and 6/10/2017 respectively. Hydrostatic pressure testing involves filling a pipeline segment with water, pressurizing the pipe to specified test standards, and demonstrating that the pressure remains constant for a specified time to establish that the pipeline's integrity is not compromised at the test pressure and that there is no leakage. Pressures and temperatures are observed and recorded throughout the test.

15. The 2017 hydrostatic pressure tests of the East and West segments were conducted by Lake Superior Consulting, a contractor to Enbridge, and were witnessed by the ITP to verify compliance with CD provisions. Following completion of the hydrostatic pressure tests, Lake Superior Consulting provided the following detailed reports to document the successful hydrostatic pressure tests:

- Lake Superior Consulting, Final Report: Enbridge Line 5 - East Straits of Mackinac Hydrostatic Test, AFE: 20007132, Hydrostatic Test #: 5-17-153, August 28, 2017, and

- Lake Superior Consulting, Final Report: Enbridge Line 5 - West Straits of Mackinac Hydrostatic Test, AFE: 20007132, Hydrostatic Test #: 5-17-154, August 28, 2017.

Each of the reports stated, "An 8-hour continuous pressure test was conducted. The strength test was completed with pressure held above 1200 psi at all locations on the pipe segment for a duration greater than 4.25 hours. The leak test was completed with the pressure held above 660 psi at all locations on the pipe segment for a duration greater than 4.25 hours." The hydrostatic test procedures used by Lake Superior Consulting met or exceeded Consent Decree requirements governing hydrostatic pressure testing.

Hydrostatic pressure tests conducted for compliance with 49 CFR Part 195 are normally conducted at a pressure equal to 1.25 times the Maximum Operating Pressure (the Straits were tested to 2.0 x MOP) of the line being tested for a period of at least four hours (strength test). In the case of a pipeline that is not visually inspected for leakage during the test, the pressure test must continue for an additional four hours at a pressure of at least 1.10 times the MOP (leak test).

16. The Lake Superior Consulting reports provide extensive details about the tests which are summarized in Tables 3 through 6, below. As shown, the maximum strength test pressure achieved in the East Leg was 1212 psi and in the West Leg 1211 psi. It is important to note that these are the lowest pressure points and are located at the highest

elevation points on the test segments. The pipe in the depths of the water crossing were subjected to higher test pressures, reaching a calculated pressure of 1347 psi in the East Leg and 1350 psi in the West Leg. All calculations used to establish MOP consider only the 1200 psi test pressure maintained at the surface and do not consider the higher pressure test levels achieved at lower depths.

Table 3. Resulting Minimum and Maximum Strength Test Pressures for the East Leg

Location	Elevation	Actual Min. Pressure	Actual Max. Pressure
Deadweight	586.4′	1240 psi	1240 psi
Maximum Elevation	651.7′	1212 psi	1212 psi
Minimum Elevation	339.4′	1347 psi	1347 psi

Table 4. Resulting Minimum and Maximum Leak Test Pressures for the East Leg

Location	Elevation	Actual Min. Pressure	Actual Max. Pressure
Deadweight	586.4′	701 psi	703 psi
Maximum Elevation	651.7′	673 psi	675 psi
Minimum Elevation	339.4′	808 psi	810 psi

Table 5. Resulting Minimum and Maximum Strength Test Pressures for the West Leg

Location	Elevation	Actual Min. Pressure	Actual Max. Pressure
Deadweight	586.8′	1239 psi	1240 psi
Maximum Elevation	651.5′	1211 psi	1212 psi
Minimum Elevation	330.7′	1350 psi	1351 psi

Table 6. Resulting Minimum and Maximum Leak Test Pressures for the West Leg

Location	Elevation	Actual Min. Pressure	Actual Max. Pressure
Deadweight	586.8′	705 psi	707 psi
Maximum Elevation	651.5′	677 psi	679 psi
Minimum Elevation	330.7′	816 psi	818 psi

17. Prior to the 2017 hydrostatic pressure tests of the Dual Pipelines, Enbridge contracted the pipeline integrity consulting firm, Kiefner and Associates, a recognized industry leader, to review and evaluate the hydrostatic pressure test plan. Kiefner and Associates not only reviewed the hydrostatic pressure test plan, but also provided "calculation of fatigue lives of possible axial flaws" in the report summarizing its review of the hydrostatic pressure test plan (Kiefner Report[2]). The Kiefner report also notes that the pipe was tested to a

[2] A. Steiner, M.J. Rosenfeld, *Line 5 Mackinac Straits Crossing Hydrostatic Test Plan Review*, Kiefner and Associates, 0023-1608, June 19, 2017.

pressure of 1700 psi after fabrication at the mill, pressure tested to 1500 psi when welded together in short segments on shore and finally pressure tested again to 1200 psi after full installation.

18. The methodology by which Kiefner assessed the crack growth is described as follows:

"The crack growth calculations were made with Kiefner's Pipelife software, which uses a simple Paris-law equation to estimate the incremental crack growth for a given flaw in response to the pressure cycles counted from the rainflow method. The pressure cycles were applied and crack growth was calculated until failure was predicted at the actual operating pressure at the anomaly location. The cumulative number of pressure cycles was then converted to a time to failure in years based on the interval over which the pressure data were collected."

19. The conclusions of the Kiefner Report include the following statement:

"The remaining life for axial flaws in above ground pipe at the scraper traps and connected above ground piping was evaluated using four yield strengths. For the 2.00 times MOP hydrostatic test, the calculated minimum time to failure for below ground pipe is 40.9 years."

20. It is important to note that the minimum 40.9-year remaining life applies to the thinner 0.500" wall thickness pipe which is installed on land. The pipe that is installed across the Straits is heavier 0.812" wall thickness pipe. The Kiefner Report estimated the 0.812" wall thickness pipe to have a remaining life between 110 years and 137 years, using a 95th percentile of yield stress. Table 7 is extracted from the Kiefner Report.

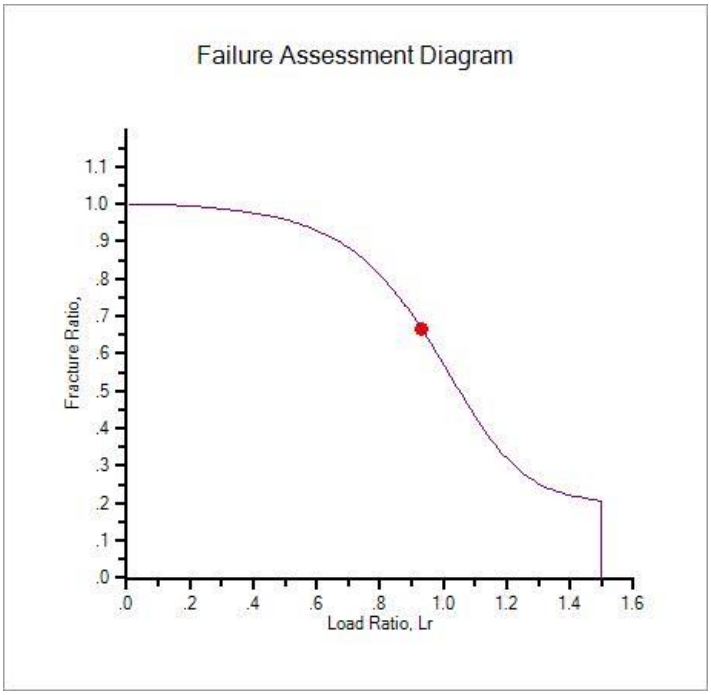
Table 7. Kiefner estimated remaining life after a hydrostatic test to 1200 psi.

Analysis Location, ft	WT, inch	Test Pressure at Location	CVN, ft-lb	SMYS		5th Percentile YS		Mean YS		95th Percentile YS	
				Yield Strength, ksi	Calculated Time to Failure, years	Yield Strength, ksi	Calculated Time to Failure, years	Yield Strength, ksi	Calculated Time to Failure, years	Yield Strength, ksi	Calculated Time to Failure, years
50	0.812	1,235	25	30	210.3	31.5	197.3	39	148.5	46	110.6
8,706	0.812	1,334	25	30	268.1	31.5	249.1	39	184.4	46	137.5

21. Assumptions used in the Kiefner Report were qualified as follows:

"Kiefner has no laboratory test data for Line 5; therefore the values for yield strength used in the analysis of this pipe grade are based on an analysis of numerous samples of Grade A and other plain carbon steel pipe of comparable vintage and type which Kiefner's lab has tested. Kiefner has completed the fatigue analysis for Line 5 consisting of Grade A pipe using four values for the yield strength; these values represent the SMYS, the upper 95th percentile, mean, and lower 5th percentile yield strength for Grade A analyzed by Kiefner's lab.

22. The methodology used by Kiefner to calculate fatigue growth using rainflow analysis of the operational data, followed by software to determine growth by the Paris Law equation is well-accepted in the pipeline industry.[3] The ITP verified Kiefner's fatigue life estimations by employing industry-accepted BMT Fleet Technologies FlawCheck® Structural Integrity Management engineering software to evaluate the remaining life using the nominal pipe properties represented by SMYS. Crack length and depth assumptions are required for a fatigue assessment. For the remaining life calculations, the crack depth was varied while the starting length was considered to be 1000 inches, the maximum extent of the scale used for calculations. The results of the ITP evaluation found, using the API 579/BS 7910 approach, that the deepest surviving flaw from the 1200 psi hydrostatic pressure test with 1000" length would be 0.296".[4] This is illustrated by the Failure Assessment Diagram (FAD) in Figure 1 and indicated by the orange vertical line in Figure 2. The blue line in Figure 2 details the estimated remining life or fatigue life for a 1000" long crack with varying depths. It may be seen that any defects surviving the hydrostatic pressure test are to the left of the orange vertical line and have a greater than 200-year remaining life. These results are consistent with Kiefner's result for SMYS as shown in Table 7. Therefore, the ITP concurs with the conclusions of the Kiefner report.



[3] American Petroleum Institute Recommended Practice 1176, *Recommended Practice for Assessment and Management of Cracking in Pipelines 1176* (1st ed. June 2016).

[4] American Petroleum Institute and American Society of Mechanical Engineers Standard API 579-1/ASME FFS-1, *Fitness-For-Service* (June 2016); British Standards Institution, BS 7910:2019, *Guide To Methods For Assessing The Acceptability Of Flaws In Metallic Structures* (2019),

Figure 1. Just surviving crack for hydrostatic test of 2000 psi in NPS 20, Gr A, 0.812" WT

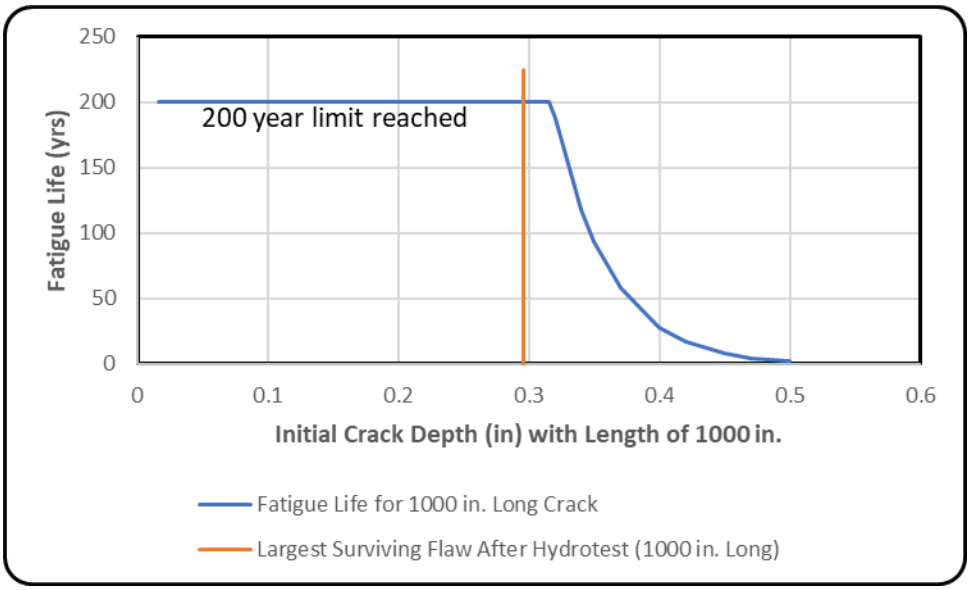


Figure 2. ITP estimate of fatigue life based on nominal pipe properties.

23. During the creation of Figure 2 it was found that no fatigue crack growth under typical operating conditions was shown to occur by calculation until a crack depth of 0.315" is surpassed. This can be said to be primarily due to the low operating stress and heavy wall pipe. More on crack growth follows.

24. Concerns have been raised surrounding damage caused by the anchor impacts that took place 4/1/2018. Enbridge had inspected the Dual Pipelines in the Straits less than 2 weeks prior to the incident as shown in Tables 1 and 2. Also provided in these tables are 2 more full sets of ILIs that took place immediately following the anchor incident. This enabled the definitive identification of the impact locations and also detailed that very minimal damage had occurred. As was prudent, Enbridge employed dive teams to inspect and repair any damage found. As the damage on the outside of the pipe was far beyond the range of ultrasonic instrumentation mounted on an ILI tool inside the pipe, divers were deployed to inspect from the outside with shear wave ultrasonic equipment. The divers employed Sonomatic shear wave inspections which confirmed that no cracks were present. These inspections were conducted on 4/28/2018 - 4/29/2018 (East Leg) and 5/12/2018 – 5/21/2018 (West Leg).[5] Subsequent dives were made to document and repair the areas. Very minor scrapes were noted within the shallow dents at the areas of

[5] Ballard Marine Construction, Automated 70° Shear Wave Inspection Of The Anchor Strike Damage On The 20" Dia L5 Pipe Line East Leg (Joint No 3570) South Impact Location (May 2, 2018); Ballard Marine Construction, Automated 70° Shear Wave Inspection Of The Anchor Strike Damage On The 20" Dia L5 Pipe Line West Leg (Joint No 3540) North and South Impact Locations (May 25, 2018).

impact. The three dents were all in the pipe body. Two were said to have scratches that were buffed out during the repair process. Filler was applied and allowed to cure within each dent prior to the application of two layers of reinforced coating specific to underwater application which overlapped the original coating. The ILI measured dent depth for the one in the East Segment was ~3.5" OD and the two in the West Segment were ~2.0% OD and ~3.5% OD. To provide an idea of the depth, a deflection of 1/3" in a 20" OD pipe is all that is required to register a 1.5% dent.

Axial Crack ILI Tool Depth Sizing Limitations and the Impact of Such Limitations on the Ability of Axial Crack ILI Tools to Identify Features on the Dual Pipelines Subject to Repair or Mitigation Based on Predicted Burst Pressure or Remaining Life

25. I am generally familiar with feature sizing capabilities of ILI tools designed for assessment of axial cracks. ILI tools have performance specifications that provide the probability that the tool can detect particular features and the specifications also outline the accuracy of feature sizing. Items to successfully complete an ILI inspection are typically the ILI velocity of travel, in-situ medium characteristics, pressure, and temperature. The information provided is not only features sizing and orientation but girth weld location, and appurtenance locations. ILI vendors may provide a detailed review of,

- Probability of Detection (POD) - The probability of a feature being detected by an in-line inspection tool.

- Probability of Sizing (POS) - The probability that a feature will be sized accurately. The accuracy with which an anomaly dimension or characteristic is reported. Typically, accuracy is expressed by a tolerance and a certainty. As an example, depth sizing accuracy for metal-loss is commonly expressed as +/-10% of the wall thickness (the tolerance) 80% of the time (the certainty).

- Probability of Identification (POI) - The probability that an anomaly or other feature, once detected, will be correctly identified.[6]

I have reviewed performance specifications provided by NDT Global LLC, an ILI vendor that provides ILI services to Enbridge, for the latest version ultrasonic Axial Crack (UC) tool. The specifications note that the axial crack depth sizing limit for wall thicknesses ranging from 20.6 mm (0.812") to 22.3 mm is 3.0mm (0.12 inches) -- or approximately 15% of the Straits wall thickness. It should also be noted that the ILI vendor's specification indicates that pipe with a wall thickness ranging from 13.0 mm to 20.6 mm is subject to a depth sizing limit of 4 mm (0.16 inch) -- or approximately 20% of the Straits wall thickness. Because the Dual Pipelines have a wall thickness of 0.812 inches, there is some ambiguity in the specification about whether axial crack ILIs on the Dual Pipelines would be subject to a maximum depth sizing limit of 3.0 mm or 4.0 mm. As discussed below, I have taken this ambiguity into account in evaluating the ability of

[6] American Petroleum Institute Standard 1163, *In-Line Inspection Systems Qualification* (2d ed. April 2013).

axial crack ILI tools to identify features that would be subject to Consent Decree requirements for repair or mitigation.

26. The most advanced axial crack tool has introduced "enhanced sizing" capability. Enhanced sizing is a new technique which enables axial crack depth sizing for features deeper than 4.0 mm, but this capability is only applicable to pipe with wall thicknesses up to 13mm (0.51 inch). Due to the Straits wall thickness of 0.812", this technique cannot be applied on the Dual Pipelines, which remain subject to the depth sizing limits referred to in the preceding paragraph.

27. Any indications detected by an axial crack ILI tool that are beyond the tool's depth sizing limit would have a saturated signal, which cannot be used for feature sizing and does not necessarily indicate the existence of a crack. A saturated signal provides no measurable depth, nor any way of characterizing the actual type of feature causing the signal. Both characterization of defect type and sizing are impaired. The term "POI" (probability of identification) in the specification refers to the confidence level of the ILI tool's ability to distinguish between an actual crack and a feature that may be benign. Given this ambiguity, the discussion below considers 0.16 inch (4mm) as the maximum depth at which POI has 80% certainty.

28. The Consent Decree establishes criteria for excavation and repair of crack features, including axial cracks. All but one of these criteria are based on a feature's estimated Predicted Burst Pressure (PBP) or Remaining Life (RL). Under the Consent Decree, the PBP of crack features is determined using CorLas® software.

29. I used the CorLas® software to examine critical crack dimensions at 600 psi (the MOP applicable to the Dual Pipelines), 750 psi (the minimum hydrostatic strength test pressure to operate at 600 psi and also the minimum PBP for excavation under the Consent Decree) and at 1200 psi (the peak pressure during the hydrostatic pressure test). The results of this analysis are shown in Figure 3. The black line in Figure 3 indicates the critical crack depths and lengths for failure at the hydrostatic pressure test pressure of 1200 psi. The orange line in Figure 3 indicates the critical crack depths and lengths for failure at the Maximum Operating Pressure of 600 psi. The solid blue line in Figure 3 shows the most stringent PBP-based dig selection criteria which are pegged to 1.25 x MOP. Therefore, any crack feature meeting Consent Decree criteria for excavation and repair would have failed during the hydrostatic pressure tests performed in 2017. Note the wide variance for the potential cracks being remedied by the 2017 hydrostatic test versus that which could be sized by a UC ILI. Note that in reference to Para. 24, Figure 3 only details the 4mm ILI tool depth sizing.

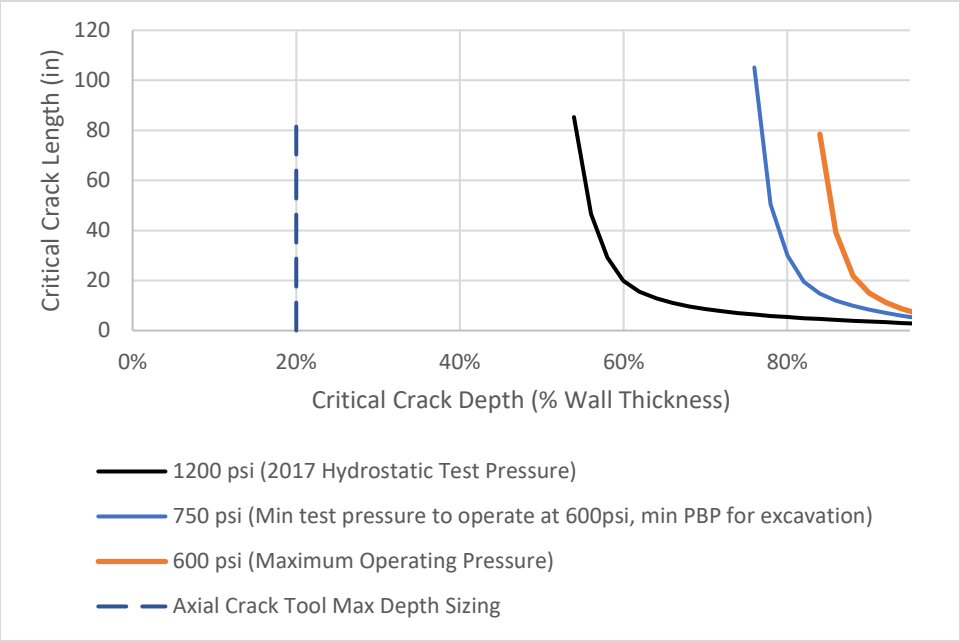


Figure 3. CorLas Critical Crack Dimensions for the Dual Pipeline

30. Based on the results of the ITP's CorLas® modeling, the ITP concludes that any crack feature that would have survived the 2017 hydrostatic pressure tests would not have met CD excavation and repair criteria. A conservative analysis employing nominal pipe properties has provided that crack feature surviving the 2017 hydrostatic pressure tests will have a greater than 200 year remaining life up to a depth of ~90% as illustrated by the yellow curve in Figure 4.The remaining life of any potential crack defect is well beyond the 5 year CD reinspection requirement.

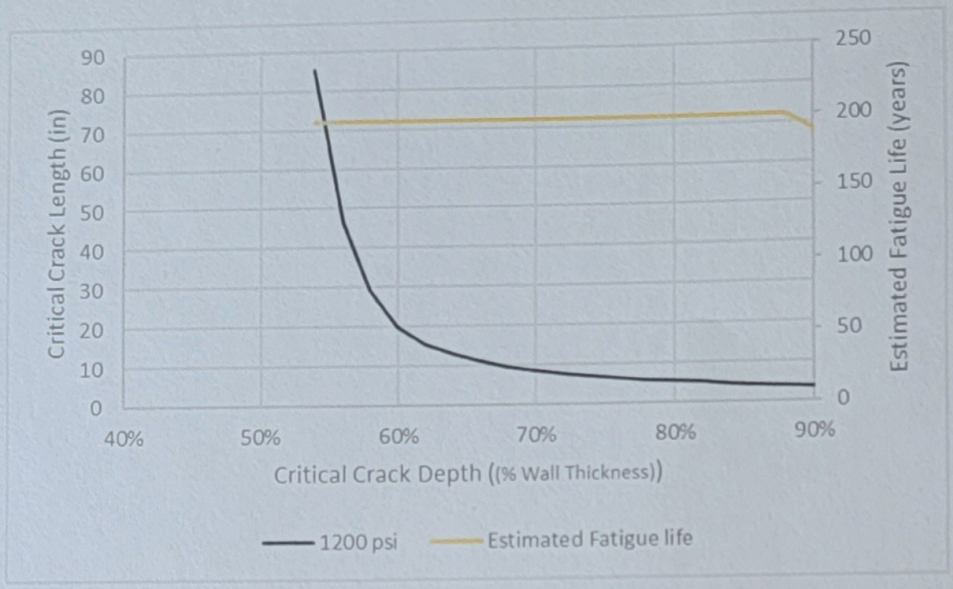


Figure 4. Estimated Fatigue life of just surviving flaws after hydrostatic test.

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

DATE: 6/2/2023 Signed: _____