REVERSAL OF ENBRIDGE PIPELINE 9B: ONGOING SAFETY RISKS

FINDINGS BASED ON DOCUMENTS MADE PUBLIC BY ENBRIDGE DURING EVALUATION OF THE PROJECT BY THE NATIONAL ENERGY BOARD (NEB)

Prepared by: Lorraine Caron, PhD
Translated by: Sandra Stephenson
For: Les Citoyens au Courant
Pipelinesfacts.com

May 11 2015

HISTORY

- **Construction begins on line 9 in 1975 following a federal government initiative. The company is IPL.**
- **In 1976 the line is opened towards Montreal with an authorized capacity of 315,000 barrels per day (design capacity maximum is 333,333 barrels per day).**
- **In 1997, IPL submits an application to NEB to reverse the flow of the pipeline towards Ontario.**
- **In 1999, IPL (now Enbridge) receives approval from NEB to open the reversed line (towards Ontario) with an authorized capacity of 240,000 barrels per day.**
- **Enbridge submits a reversal project for line 9B to the NEB in November 2012, and requests increased capacity in line 9 to 300,000 barrels per day towards Montreal.**

Source: National Energy Board (NEB), Reasons for Decision. Enbridge Pipelines Inc. OH-002-2013, March 2014, p 8-9.

REPORT ON OPERATIONS

- **At the opening of line 9 in 1976, the average flow was around 125,000 barrels per day. (The Gazette, June 16 1976, page 35)**
- **Between 1991 and 1997, line 9 was not a significant means of transferring oil since there wasn't much oil to transport. The 20 year contract between the federal government and IPL, which guaranteed operation without financial loss for IPL, ends in 1996.**
- **In 1997, the company asks the NEB to reverse the flow towards Ontario, which is granted after successful hydrostatic tests.**
- **Between 2009 and 2011, average flow is around 64,000 barrels per day.**
- **Since 2010, line 9 operates at reduced pressures.**

  (Enbridge Sept 2014 Updated Engineering Assessment, p. 88)

Sources : E. Ferguson. Line 9 History. Line9communities.com; Rising Tide Toronto. Not Worth the Risk. A Community Report on the Line 9 National Energy Board Hearings, March 2014.

THE ENBRIDGE PROJECT

- **To reverse the flow of line 9B from North Westover (Ontario) to Montreal to carry several types of oil, including heavy crude from the tar sands, to refineries operated by Suncor in Montreal and Valero at Levis.**
- **To increase the average annual capacity of line 9B to 300,000 barrels per day, without exceeding the maximal design capacity of 333,333 barrels per day.**
- **To stay below the maximum operating pressure (MOP) aproved in 1999 by using drag reducing agents.**
- **Enbridge expects to begin operations in Q2 2015.**

Sources: National Energy Board (NEB), Reasons for Decision. Enbridge Pipelines Inc. OH-002-2013, March 2014, pp .9-10 ; Transcript from Enbridge Earnings Call for Q1 2015, May 6 2015, available on seekingalpha.com.

INTERNAL INSPECTION OF LINE 9

Terminology

- **In-line Inspection (ILI):**

Inspection of the conduits by internal inspection devices such as the smart pig, which can scan the internal surface and provide data concerning different sorts of wear and faults.

For example, the pig moves inside a pipeline for purposes of inspection, cleaning or measuring.

Inspection Calendar

- **For corrosion:**

Sections of line 9B between North Westover and Montreal were inspected in 2012, and the next internal inspection is set for 2017 (p. 43)

- **For cracks:**

Sections situated between the station at Cardinal (Ontario) and the Montreal terminal were inspected internally in 2004 and in 2013 (pp. 45 and 52). The next inspection is set for 2015 (p. 94)

Sources: Enbridge Pipelines Inc. Line 9B Reversal and Line 9 Capacity Expansion Project. September 2014 Updated Pipeline Engineering Assessment, September 22, 2014; Pigging Products & Services Association. Pigging Terminology (ppsa-online.com).

ILI RESULTS

- **Following internal inspection (ILI) of the entire line 9 in 2012, the total number of fault features detected was 12,848 (p. 53)**
- **For the section that passes under the Ottawa River, the number of detected features increased 500% between the ILI of 2004 and those conducted in 2012: rising from 50 to 250 (fig. 4.25, p. 55)**

Source Enbridge Pipelines Inc. Line 9B Reversal and Line 9 Capacity Expansion Project. September 2014 Updated Pipeline Engineering Assessment, September 22, 2014.

OBSERVATIONS MADE DURING THE EXCAVATIONS

- **The selection of fault features requiring repairs is based on the notion of 'pressure failure.' Fault and wear features detected by ILI, which were assessed as incapable of withstanding 125% of operating pressure, were excavated (p. 59).**
- **The 989 excavations of parts of line 9 addressed approximately 3000 features of the 12,848 detected by ILI (p. 64)**
- **Observation of the pipeline at the 989 excavation sites revealed nearly 15,000 fault features, including 13,000 in the section between Cardinal (Ont.) and Montreal. (pp. 67-68)**
- **We do not know what percentage of line 9 (which is 1033 km long) was excavated and inspected visually: 1%? 10%?**

Source: Enbridge Pipelines Inc. Line 9B Reversal and Line 9 Capacity Expansion Project. September 2014 Updated Pipeline Engineering Assessment, September 22, 2014.

CRACKS NOT DETECTED BY ILI

- **Examination of line 9 by way of the 989 excavations revealed 187 cracks and 18 stress corrosion cracks (SCC) that were not detected by ILI, but which, according to Enbridge, could withstand a hydrostatic test* up to 125% of operating pressure. (p. 68)**

  *hydrostatic test: internal pressure test using water to verify resistance and seal integrity of pipes, especially in oil pipelines.

- **In August 2013, a long crack which had not been detected by ILI, was reported by a field technician. The crack was contained by an encirclement sleeve and the section removed the following spring for analysis (p. 67)**

Source: Enbridge Pipelines Inc. Line 9B Reversal and Line 9 Capacity Expansion Project. September 2014 Updated Pipeline Engineering Assessment, September 22, 2014.

CORROSION NOT DETECTED BY ILI

Visual examination of the section between Cardinal station and Montreal terminal revealed a hole of 10mm caused by corrosion (p. 31)

This hole was not detected in recent, nor earlier ILI (p. 31)

During the NEB hearings, the Ontario Pipeline Landowners' Association (OPLA) indicated that there is no internal inspection (ILI) tool currently on the market which can detect pinhole corrosion leaks.

Source: Enbridge Pipelines Inc. Line 9B reversal and Line 9 Capacity Expansion Project. September 2014 Updated Pipeline Engineering Assessment, September 22, 2014. NEB Hearing Order OH-002-2013, Enbridge Pipelines Inc, Line 9B Reversal and Line 9 Capacity Expansion Project Application under s.58 of the NEB Act, October 2013, Volume 6, p. 117.

ILI AND PINHOLE CORROSION

ILI AND PINHOLE CORROSION:

"In response to OPLA's Information Request 1.79 parts (d) and (e), Enbridge advised that:

"…there are no ILI tools available that can accurately detect pinhole corrosion."

And further:

"All commercially available metal loss ILI tools have limitations resulting in uncertainties in characterizing pinhole corrosion." "

Source: NEB Hearing Order OH-002-2013, Enbridge Pipelines Inc, Line 9B Reversal and Line 9 Capacity Expansion Project Application under s.58 of the NEB Act, October 2013, Volume 6, p. 117.

LEAKS ON LINE 9 (1)

-35 leaks have been documented on the whole of line 9 since it opened in 1976

-Only leaks of less than 1500 litres are reported to NEB (*NEB Onshore Pipeline Regulations*, s. 1 'incident')

-Enbridge enumerated 12 leaks and one rupture on the pipeline (other than at terminals and pumping stations) (*Pipeline Integrity Engineering Assessment,* November 2012, pp. 16-17)

-The Ontario Ministry of the Environment documented 22 leaks out of the 30 discovered on their territory

Source: Inquiry conducted by the W5 team from the Canadian Broadcast Corporation and referenced in the Toronto Star, 22 February 2014

LEAKS ON LINE 9 (2)

- **Of the 35 documented leaks, 5 were in Quebec:**
  - **Terrebonne: 1 leak (4000 litres)** one leak (4000 litres) at the pumping station in 2011
    - **Leak revealed by Enbridge during the NEB hearings in 2013**
  - **Mirabel: 2 leaks (5000 litres)**
  - **Montréal: 2 leaks (3,005,000 litres)**

Source: Inquiry conducted by the W5 team from the Canadian Broadcast Corporation and referenced in the Toronto Star, 22 February 2014

LEAK DETECTION (1)

-Enbridge's leak detection program includes several methods, such as inventory calculations at regular intervals and visual surveillance.

-According to Enbridge, more than 30% of the detected leaks in line 9 were detected by parties other than Enbridge.

-During public hearings of the NEB, Durham CLEAR indicated that Enbridge's remote detection system (computational pipeline monitoring) only signaled leaks greater than 588 litres per minute.

-At this rate of flow, it would be two hours before the system could detect the leak, which could amount to a spill of 70,000 litres.

Sources: Enbridge Response to NEB IR no 4 for Condition 16 – Appendix A : Enbridge Risk Management Mitigation Measures. November 27, 2014; Audience de l'ONÉ, 16 Oct 2013, volume 5, page 147.

LEAK DETECTION (2)

Extract from the NEB hearings:

“In Enbridge's response to NEB Information Request 3.10.C, they acknowledge that their computation pipeline monitoring system, CPM:

"...will not detect a leak below 70.5 [cubic metres], 443 [barrels] over a two-hour period".

That works out to 3.7 barrels per minute”.

Source: NEB Hearing Order OH-002-2013, Enbridge Pipelines Inc, Line 9B Reversal and Line 9 Capacity Expansion Project Application under s.58 of the NEB Act, October 2013, Volume 5, p. 147.

INDEPENDENT EVALUATION

- **An international expert on pipeline security (R. Kuprewicz) conducted an independent examination of the data in the 2012 technical report submitted by Enbridge on the integrity of line 9B.**
- **This expert warned against Enbridge's excessive dependence on internal inspection devices to ensure the integrity of the existing pipeline (p. 30)**
- **On the basis of deficiencies noted in the management program for pipeline integrity, the expert estimated that the risk of rupture on the line is high if the reversal project takes place (p. 28)**
- **The first recommendation by this expert to the NEB is that hydrostatic tests on the existing line should be conducted before recommissioning (p. 30)**

Source: Accufacts Inc. Report on Pipeline Safety for Enbridge's Line 9B Application to NEB, August 5, 2013.

HYDROSTATIC TESTS

"Hydrostatic testing is used to confirm safe operations of our system by testing pipe integrity using water pressurized above normal operating levels" (Enbridge. Hydrostatic Pressure Testing on Operating Pipelines)

- A hydrostatic test is an optimal practice recognized by the Canadian Energy Pipeline Association, to ensure there are no defaults in the pipeline (CEPA, June 12, 2013)
- The test is used on newly constructed pipelines and on old pipelines when these have been inactive for more than a year, or for confirming their integrity (CSA norm Z662)
- A hydrostatic test can verify that the oil conduit is capable of operating at maximal pressure specified in the project, thereby allowing for safe operation of the pipeline.

Sources: Enbridge. Hydrostatic Pressure Testing on Operating Pipelines. Available at: http://s3.documentcloud.org/documents/724930/hydrostaticpressure-testing.pdf; CEPA, June 12, 2013. Available at: http://www.cepa.com/fr/lessai-hydrostatique-aide-a-maintenir-lintegrite-des-pipelines

HYDROSTATIC TESTS ON LINE 9

- **Line 9 has passed 2 hydrostatic tests:**

  1. in 1976 before its initial operation

  2. in 1997 before restarting operations with reversed flow

- **No leaks or ruptures were noted during these two tests**
- **For the current reversal project Enbridge conducted obligatory hydrostatic tests on new structures within pumping stations and terminals, as required by article 47 of the *NEB Act*, and the results were submitted to the NEB with their application for authorization to resume service (LTO) on February 6, 2015.**
- **The existing pipeline has not been tested hydrostatically in 18 years.**

Sources: Enbridge. Pipeline Integrity Engineering Assessment, November 2012, p. 16-17; Enbridge Pipelines Inc .Line 9B Reversal and Line 9 Capacity Expansion Project. Order XO-E101-003-2014 – Partial Leave to Open Application No 6 (final), February 6, 2015.

REQUESTS FOR HYDROSTATIC TESTS ON LINE 9

Several authorities and organizations have recommended that NEB oblige Enbridge to proceed with hydrostatic tests on the entirety of Line 9 before reversing the flow::

- **Richard Kuprewicz, expert in pipeline security (Aug 2013)**
- **Ontario Ministry of Energy (October 2013)**
- **Ontario Pipeline Landowners Association (October 2013)**
- **Equiterre Coalition (October 2013)**
- **Montreal Metropolitan Community (November, 2013)**
- **The Government of Quebec (CAPERN, December 2013)**

Sources: NEB, Reasons for Decision. Enbridge Pipelines Inc. OH-002-2013, March 2014, p 44 ; Rising Tide Toronto. Not Worth the Risk. A Community Report on the Line 9 National Energy Board Hearings, March 2014.

ENBRIDGE'S REFUSAL

Since it submitted its project in 2012, Enbridge has consistently refused to conduct hydrostatic tests on the existing pipeline, maintaining that its internal inspection techniques are sufficient to ensure pipeline integrity.

The refusal has resulted in three concrete actions:

1. An application to the NEB for exemption from having to submit a request for leave to open, that includes submitting results from hydrostatic tests on newly constructed pipes. This application was refused by NEB. (p. 56)
2. An argumentation claiming that hydrostatic tests would damage the existing pipeline
3. A targeted critique of R. Kuprewicz' report recommending the test

Sources: National Energy Board, Reasons for Decision Regarding Enbridge Pipelines Inc. OH-002-2013, March 2014, p. 56; Rising Tide Toronto. Not Worth the Risk. A Community Report on the Line 9 National Energy Board Hearings, March 2014.

ENBRIDGE REQUESTS AN EXEMPTION

- When it submitted the reversal project, Enbridge attempted to use article 58 of the *NEB Act* to exempt itself from the need to apply article 47, which requires an application to authorize operation (LTO) for the pipeline, including among other things, a description of the installations submitted to hydrostatic testing, and a declaration showing that hydrostatic tests were executed and the results were judged acceptable. This request for derogation was refused by the NEB.

- Nevertheless, neither section 47 nor section 23 in the *NEB on-shore regulations* sets out in detail how to determine the extent of installations and conduits which must undergo hydrostatic tests.

Source: *National Energy Board Act*, sections 47 & 58; NEB. Filing Manual, Guide T - Leave to Open. Release 2014-03 ; *National Energy Board on-shore regulations.* DORS/99-294, up-dated November 25, 2014.

ENBRIDGE'S ARGUMENTS (1)

- *"Hydrotesting is not the primary method utilized by pipeline operators that are able to use high resolution In-Line Inspection tools for integrity verification".*
  - '……..' our response: Enbridge does not even use the most sophisticated ILI (eg. Phased-Array ILI); in every case the Enbridge argument fails to mention that ILI tools have not yet attained the degree of reliability of hydrostatic tests; in addition, Enbridge's argument does not exclude hydrostatic testing to complement ILI as recommended by Dynamic Risk in a report to the Quebec government
- *"Hydrotesting only provides confirmation at a point in time that the remaining defects have dimensions smaller than a critical size defect. It does not guarantee that the line will not fail in the future".*
  - '…….' our response: No test, including ILI, can guarantee that a pipeline will not fail in the future. It is necessary to conduct a hydrostatic test to confirm immediately (before operating the re-opened pipeline) that the conduits are safe according to established conditions.

Source: Enbridge Response to Ontario Ministry of Energy Information Request No 1, section 1.14 Hydrostatic test, pp. 22-23. Available at : https://docs.neb-one.gc.ca/ll-eng/llisapi.dll/fetch/2000/90464/90552/92263/790736/890819/918445/965100/B20_%2D_Enbridge_Response_to_Ontario_Ministry_of_Energy_IR_No_1_%2D_A3I6Y8.pdf?nodeid=965165&vernum=-2ß

ENBRIDGE'S ARGUMENTS (2)

- *"Consideration is also given to the potential detrimental effects of hydrotesting, including potential to induce or grow cracks which do not fail during the hydrotest, but may continue to grow in-service."*
  - '…….' our response: Enbridge's claim that hydrostatic tests lead to growth in cracks and stress faults is not based on submitted empirical data. Enbridge is simply 'considering the potential' that a hydrostatic test can damage a pipeline. This damage could be real if the test is not well executed, but where the test is conducted properly, the argument invoking possible damage is without technical merit unless there is significant weakness in the pipe before it was tested. R. Kuperwicz compares this argument to an attempt to misinform the public and decision-makers (Accufacts, 2013, p. 30)

Source: Enbridge Response to Ontario Ministry of Energy Information Request No 1, section 1.14 Hydrostatic test, pp. 22-23. Available at : https://docs.neb-one.gc.ca/ll-eng/llisapi.dll/fetch/2000/90464/90552/92263/790736/890819/918445/965100/B20_%2D_Enbridge_Response_to_Ontario_Ministry_of_Energy_IR_No_1_%2D_A3I6Y8.pdf?nodeid=965165&vernum=-2ß

ENBRIDGE'S ARGUMENTS (3)

- *"These potential detrimental effects are anticipated to be managed and mitigated through further monitoring such as In-Line Inspection should hydrotesting be performed".*
  - '……..' our response: It is clear that Enbridge wishes to avoid spending more time and money to ensure the integrity of the pipeline. ILI methods are the least expensive. Attributing detrimental effects to hydrostatic tests is without technical merit. In any case, the next ILI is already set by Enbridge for 2015, so it would presumably detect such faults if they were to occur.

- *"Hydrotesting which resulted in propagating crack growth would be couterproductive to Enbridge efforts to eliminate pipeline failures".*
  - '……..' our response: A hydrostatic test which causes growth of cracks would be counterproductive, as in poorly conducted testing. But Enbridge provides no proof that hydrostatic tests have caused or can cause such damage. Enbridge's argument is misleading because it posits a hypothetical case to suggest that all hydrostatic testing would result in growth of cracks and faults.

Source: Enbridge Response to Ontario Ministry of Energy Information Request No 1, section 1.14 Hydrostatic test, pp. 22-23. Available at : https://docs.neb-one.gc.ca/ll-eng/llisapi.dll/fetch/2000/90464/90552/92263/790736/890819/918445/965100/B20_%2D_Enbridge_Response_to_Ontario_Ministry_of_Energy_IR_No_1_%2D_A3I6Y8.pdf?nodeid=965165&vernum=-2ß

WHY INSIST ON HYDROSTATIC TESTS? (1)

1. **In-line Inspection devices used by Enbridge are not sufficient to confirm pipeline integrity. (Accufacts, 2013, p. 24)**
2. **Optimal validation of the integrity of an existing pipeline requires deployment of two approaches in concert: repeated ILI and hydrostatic tests, with carefully scheduled intervals between conducting each type of test (Dynamic Risk, 2014, p. 25)**
3. **Only a hydrostatic test can reveal pinhole corrosion faults undetectable by in-line inspection devices.**

Sources: Accufacts Inc. Report on Pipeline Safety for Enbridge's Line 9B Application to NEB, August 5, 2013; Dynamic Risk Assessment Systems, Inc. Review and Assessment of Technical Evaluation for Enbridge Line 9B Reversal. Final Report for Ministère du développement durable de l'environnement, de la faune et des parcs, April 9, 2014.

WHY INSIST ON HYDROSTATIC TESTS ? (2)

4. **In Canada, between 1999-2009 the major causes for pipeline rupture were cracking (38%) and metal loss (27%) (NEB, 2011, p. 10). The pipelines that ruptured during the 1999-2004 period were internally inspected. The In-Line Inspection tools could not properly detect the defects that caused the ruptures. (Jeglic, 2004, p.1)**
5. **In-line inspection tools used by Enbridge are not 100% likely to detect faults and wear features. They can miss certain features, such as small corrosion holes, which will leak at the pressures required for a hydrostatic test. This is precisely the purpose of a hydrostatic test: to reveal weak points with water instead of oil.**
6. **Enbridge has claimed *without proof* that residual wear features in the line would be able to withstand hydrostatic test pressures at 125% maximum operating pressure.**

Sources: NEB. Focus on Safety and Environment. A Comparative Analysis of Pipeline Performance 2000-2009. December 2011; Franci Jeglic for NEB, Analysis of Ruptures and Trends on Major Canadian Pipeline Systems, 2004. Available in the archives of the NEB website.

LESSONS FROM KALAMAZOO (1)

- **A rupture in Enbridge's line 6B in Michigan in 2010 brought about the largest on-shore oil spill in US history: it took Enbridge 17 hours to recognize the break in the oil line, allowing 3 million litres of oil to flow into the Kalamazoo River, causing major impacts for 40 km. Clean-up took 3 years and cost the company more than 1.2 billion dollars.**
- **The National Transportation Safety Board (NTSB) concluded that the probable cause of the rupture was pre-existing cracks brought on by corrosion. No hydrostatic test(s) had been conducted before the flow was reversed, and though smart pig technology had been used, Enbridge did not pay attention to the fault which caused the rupture.**
- **After an inquiry, the Pipeline and Hazardous Material Security Agency (PHMSA) produced a Corrective Action Order that required among other things, a hydrostatic test before recommissioning. Certain parts of this pipeline were so damaged that the company replaced several kilometres in the region. The new conduit has a thicker shell, cathodic corrosion protection, and will be monitored through several security tests.**

Source : National Transportation Security Board. Enbridge Incorporated Hazardous Liquid Pipeline Rupture and Release, Marshall, Michigan, July 25, 2010, Accident report, NTSB, 2012; PHMSA Corrective Action Order, July 28, 2010 ; PHMSA Corrective Action Order Amendment, September 22, 2010.

LESSONS FROM KALAMAZOO (2)

- **Lines 9B and 6B have important similarities in terms of age, construction (diameter, steel thickness and polyethylene covering) and usage. Line 6B is an oil pipe 30 inches in diameter built in 1969, whose flow was reversed later to transport diluted bitumen from the Canadian West, and Bakken shale oil from North Dakota.**
- **In 2014 PHMSA concluded that the conversion of existing pipelines to carry different types of hydrocarbons and reversal of flow constitute fundamental changes which call for specific measures to guarantee their security, including the requirement for new hydrostatic testing.**

Sources: National Transportation Security Board. Enbridge Incorporated Hazardous Liquid Pipeline Rupture and Release, Marshall, Michigan, July 25, 2010, Accident report, NTSB, 2012; PHMSA Pipeline Safety: Guidance for Pipeline Flow Reversals, Product Changes and Conversion to Service, September 18 2014.

HYDROSTATIC TESTS CONDUCTED BY ENBRIDGE IN THE USA

- A hydrostatic test on a section of 6B over 20km long was conducted by Enbridge on August 30, 2010, under supervision of PHMSA (Pipeline and Hazardous Material Security Agency) and under orders from that agency, following the spill into the Kalamazoo River.

-After a leak on Enbridge's line 14 in July 2012, the PHMSA required more stringent hydrostatic tests before recommissioning. These tests were conducted by Enbridge under PHMSA supervision.

-Enbridge performed a hydrostatic test in 2013 on a 60-year-old pipe they had rented to Wolverine Pipe Line Company as part of an expansion project for Enbridge line 79, to link its line 6B to the Marathon refinery in Detroit, Michigan (Ann Arbour News, March 19, 2013)

Sources: Enbridge. Line 6b Integrity Verification and Remedial Work Plan. Prepared for PHMSA, September 26, 2010, p. 3; PHMSA. One Year Later. Update on Enbridge Lakehead System Improvements.

THE NEB HAS THE POWER TO EXACT HYDROSTATIC TESTS ON LINE 9B

- NEB's decision in March 2014: "….[T]he Board elects to make no order at this time regarding hydrotesting of the pre-existing portions of Line 9. … After receiving the Updated EA and Enbridge's filings in respect of completed repairs and ILI tool reliability, and after considering Enbridge's corporate policies and approach with respect to hydrotesting, the Board may revisit the issue of requiring hydrotesting prior to granting LTO. … [T]he Board will consider Enbridge's response to Conditions 9, 10 and 11, to determine whether it ought to require Enbridge to perform hydrotesting on existing portions of Line 9."

National Energy Board, Reasons for Decision Regarding Enbridge Pipelines Inc. OH-002-2013, March 2014, page 49.

THE NEB DECIDED NOT TO REQUIRE THE TESTS

- **Based on the responses of NEB directors during their visits to the Montreal Metropolitan Community Council and HEC (Hautes Etudes Commerciales) on February 26, 2015, it is likely that the NEB will not require Enbridge to conduct hydrostatic tests on the existing portions of Line 9B to verify that it is leak-proof before it is granted leave to open. To justify their decision, NEB directors repeated Enbridge's arguments.**

Sources: Witness account by R. Grimaudo, Mayor of St. Lazare, who attended the MMC meeting where Peter Watson was hosted on Feb. 26 2015, and by a member of Citoyens au Courant who attended the HEC Conference featuring NEB directors on Feb. 26 2015.

SUMMARY OF FINDINGS (1)

1. Though the pipeline was constructed in 1975 to transport 315,000 barrels per day, the 9B reversal project and the increase of the capacity of line 9 will produce an authorized average annual flow of 300,000 barrels/day, which the conduits have probably never been subjected to.
2. This is an ageing pipeline, despite under-utilisation up until now. According to the 2012 in-line inspection (ILI), the number of wear features in the section under the Ottawa River had quintupled. During 989 excavations in 2013 and 2014, several other wear elements were discovered that had not been detected by ILI, confirming that the devices have a detection probability less than 100%.

SUMARY OF FINDINGS (2)

3. Enbridge has indicated that there is no device for internal inspection (ILI) on the market currently which allows for detection of pinhole corrosion faults.
4. Enbridge has indicated that its remote leak detection system does not detect leaks less than 588 litres per minute.
5. Enbridge refuses to proceed with hydrostatic tests on the existing line, based on presumptions about potentially damaging effects of this approach and not on the basis of proven data.
6. Although the pipeline underwent hydrostatic tests before each of its previous commissions in 1976 and 1997, the NEB is unlikely to require hydrostatic testing on the existing pipeline this time, prior to approving re-opening.

RISKS FOR THE POPULATION AND THE ENVIRONMENT

1. Significant risk of slow leaks caused by pinhole corrosion, undetectable by internal inspection methods, which could contaminate agricultural land, ground water wells and water tables (aquifers).
2. Risk to the health of residents along the line, whose water provisions come from surface wells.
3. Increased risk of rupture due to the reversed flow, changed products (shale oil, dilbit), increased capacity and resulting pressure cycles.
4. Unacceptable risk to numerous major rivers considering the potential consequences for the environment and drinking water of millions of people

CONCLUSIONS

1. Demonstrated weaknesses remain concerning Enbridge's pipeline 9B: age, numerous repairs, pinhole corrosion faults, growing cracks, infrequent use at full flow.
2. Significant limits remain concerning the internal inspection devices used to evaluate the integrity of the pipeline.
3. The risks judged reasonable in practice by Enbridge and the NEB regarding possible leaks and spills, are unacceptable from the point of view of security and public safety. The NEB "considers any release to be undesirable," but allows calculated risk at high levels. (Reasons for Decision, March 2014, p. 57).
4. The last hope to avoid a major spill from an old pipeline would be a complete verification of the pipeline integrity using hydrostatic tests on the totality of the line, in addition to the targeted tests already conducted by Enbridge in its pumping stations.

RECOMMENDATIONS

1. Considering the NEB's decision not to require more sectional valves to diminish flow volume BEFORE commissioning; and
2. Considering the NEB's current position not to exact hydrostatic tests on the entire line 9B to guarantee that it is leak-proof before authorizing re-opening of service:
3. We recommend that elected councillors of municipalities call on the NEB to require hydrostatic tests on all sections of the existing line as a PRIOR condition to recommissioning; and
4. We recommend that the Government of Ontario make direct contact with the NEB to insist on hydrostatic tests on the entire existing pipeline and to ensure that these tests are supervised by an independent third party.
5. We recommend that, in the event that the NEB does not require such tests, they produce detailed written reasons explaining Enbridge's 'corporate approach to hydrotests', and how that fits with public safety interests.