EB-2024-0125
Enbridge Gas 2023 DVAs

Interrogatories of Environmental Defence

Interrogatory # A-ED-1

Reference: Exhibit A, Tab 3, Page 3

Question(s):

(a) On page 3, Enbridge refers to and relies on a number of decisions and settlement agreements relating to UFG. Please provide excerpts of all portions of those decisions and settlements relating to UFG.

Interrogatory # B-ED-2

Reference: Exhibit B, Tab 3, Schedule 1, Page 2

Question(s):

(a) Please provide Enbridge's understanding of the allowable scope for O&M spending for the purposes of ESM calculations. Please provide all relevant criteria.
(b) For example, is it a requirement that purpose of all O&M spending being to provide gas distribution services to customers?
(c) Enbridge spent $5.4 million on donations and memberships in 2023. Please provide a list of the 10 most expensive donations and 10 most expensive memberships in 2023.
(d) How much did Enbridge spend on marketing in 2023? Please include salaries. Please include a list of the 5 most expensive line items.
(e) How much did Enbridge spend research and development in 2023? Please provide a breakdown between spending from the DSM budget and spending outside the DSM budget.
(f) How much did Enbridge spend on research and development relating to gas heat pumps in 2023?

Interrogatory # C-ED-3

Reference: Exhibit C, Tab 1, Page 19

Question(s):

(a) Please provide an estimate of the savings to customers arising from the East Kingston Creekford Rd. IRP alternative. Please include the underlying calculations, ideally in a spreadsheet.

(b) Why is Enbridge not seeking shared savings or another incentive in relation to this first IRP alternative?

Interrogatory # D-ED-4

Reference: Exhibit D, Tab 1

Question(s):

(a) Please add columns to Table 1 on Page 6 for each rate zone, the year-over-year percent change for each rate zone, and for the total for Union and Enbridge. Please explain the difference between UAF and UFG. If they are different, please also provide the requested table for UFG. For both, please also add rows for 2024 (annualized) and for the totals over the whole period.
(b) Please provide a table showing the total UFG from 1991 to 2023 for Enbridge and its predecessors, an average annual commodity cost for each year, and the cost of the UFG for each year. Please also add a row for 2024 and for the totals over the whole period.
(c) Please file the 2019 UFG Report referred to on page 10 so it will be properly on the record and can be referred to with an exhibit number.
(d) Please file the UFG Progress Report and Supplemental UFG Progress Report referred to on page 30 so they will be properly on the record and can be referred to with an exhibit number.
(e) Please provide the global warming impact (tonnes CO2e) of 1 m3 of combusted natural gas and 1 m3 of natural gas vented to the atmosphere.

Interrogatory # D-ED-5

Reference: Exhibit D, Tab 1

Question(s):

(a) Please explain the following statement from page 12: "It is reasonable to assume that such trends in UFG volumes or related trends in UFG costs may be reflective of common macroeconomic, geo-political, and/or national/continental weather trends, which have the potential to impact UFG volumes or costs broadly across the industry.

Interrogatory # D-ED-6

Reference: Exhibit D, Tab 1

Preamble: Page 25 states as follows:

> "On a monthly basis, the determination of Sendout includes an entry to record operational blowdowns or flaring associated with compressor facilities as noted in the discussion on Sendout above. By accounting for the volumes associated with these operational blowdowns or flaring, these volumes are removed from Sendout

and as such do not contribute to calculated UFG volumes. A similar entry is recorded, where necessary, for blowdowns or flaring associated with capital projects."

Question(s):

(a) Please provide a definition of blowdowns. Does it ever include something other than allowing methane to be released to the atmosphere?
(b) Please provide a breakdown of the total volumes of blowdowns over the past five years, with a breakdown by type if possible (e.g. compressor related versus capital project related).
(c) Please provide a breakdown of the total volumes of flaring over the past five years, with a breakdown by type if possible (e.g. compressor related versus capital project related). If it cannot be differentiated from blowdowns, please provide the total of both.
(d) Who pays for the cost of gas released to the atmosphere in blowdowns or flared. If it differs depending on the situation, please describe each relevant situation. Please describe the regulatory mechanism used in each case.
(e) Why are blowdowns and flaring associated with compressor facilities not included in UFG?
(f) Are the emissions from blowdowns accounted for in Enbridge's climate accounting with respect to its climate targets?

Interrogatory # D-ED-7

Reference: Exhibit D, Tab 1, p. 31-32

Question(s):

(a) Please list and define the different classes of leaks.
(b) Please provide a table showing the number of leaks of each class in Enbridge's system as of December 31 of each of the last five years and the current number.
(c) Please file and describe the "Enbridge Gas Leak Standard."
(d) Please provide the calculations underlying the leak loss reductions estimates on page 32.
(e) Using the industry-average emissions factors described on page 32, please provide an average estimated m3 lost per leak, and ideally per leak of each class if possible. Please include appropriate caveats.

Interrogatory # D-ED-8

Reference: Exhibit D, Tab 1, p. 61

Question(s):

(a) Please provide an updated version of table 11 that provides the annualized cost over the lifetime of the equipment.

Interrogatory # D-ED-9

Reference: Exhibit D, Tab 1, p. 61

Question(s):

(a) Please provide a table showing the emissions (CO2e) arising from all fugitive emissions for each of the past 5 years.
(b) Please provide a table showing the emissions (CO2e) arising from all fugitive emissions and unknown UFG for each of the past 5 years on the assumption that unknown UFG is being leaked.

Interrogatory # D-ED-10

Reference: Exhibit D, Tab 1, p. 61

Question(s):

(a) Please provide a table showing the cost arising from all known fugitive emissions for each of the past 5 years.
(b) Please provide a table showing the cost of all fugitive emissions and unknown UFG for each of the past 5 years.

Interrogatory # D-ED-11

Reference: Exhibit D, Tab 1, p. 61

Question(s):

(a) Please provide a table showing, for each of the past ten years, Enbridge's total UFG (m3) and as granular a breakdown by source/cause (m3), including a column for "unknown" source.
(b) Please provide a description of teach source/cause listed in the table above, what it includes, and how it is estimated.
(c) Please provide a version of the table described in (a) which provides the breakdown by source as a percentage of the total UFG.

Interrogatory # D-ED-12

Reference: Exhibit D, Tab 1, p. 62

Question(s):

(a) For each item described in paragraph 122, please provide an estimated start date and completion date.
(b) When will the technology pilot be complete?

(c) When Does Enbridge plan to roll out the measurement program based on the pilot?

Interrogatory # D-ED-13

Reference: Exhibit D, Tab 1, attachment 1

Question(s):

(a) Please file a copy of the Clearstone study referred to on page 53 of attachment 1.

Interrogatory # D-ED-14

These questions are for Highwood

Reference: Exhibit D, Tab 1, attachment 1

Question(s):

(a) Page 59 states that "a vehicle-mounted advanced mobile leak detection (AMLD) system, capable of detecting and quantifying leaks, was piloted in 2023." What were the learnings from that pilot?
(b) Why would Enbridge need to run another vehicle-mounted leak detection pilot?
(c) Approximately how many kms of distribution pipelines does Enbridge own in Ontario?
(d) Approximately how many kms of distribution pipelines does Enbridge test for leaks with on-site methane measurements each year?
(e) Approximately how many meters does Enbridge own in Ontario?
(f) Approximately how many meters does Enbridge test for leaks with on-site methane measurements each year?
(g) How are DO emissions calculated using generic EFs? Please provide 4 examples for the 4 most typical leak types or sizes.

Interrogatory # D-ED-15

These questions are for Highwood

Reference: Exhibit D, Tab 1, attachment 1

Question(s):

(a) Page 59 states: "Annual leak surveys are performed on a portion of distribution assets, covering about one-fifth of the system yearly." Page 62 states: "The current LDAR program is based on historic practices of surveying approximately 1/7th of the infrastructure each year using handheld portable gas monitors on foot (in rural areas, operators drive with gas monitors)." Please reconcile the statements.
(b) Page 62 states: "The current LDAR program is based on historic practices of surveying approximately 1/7th of the infrastructure each year using handheld portable gas monitors

on foot (in rural areas, operators drive with gas monitors)." Please describe how this is accomplished physically. Does a person literally walk or drive along all segments of a pipeline at a slow enough speed to measure methane? Does this include pipelines that are not along roads (e.g. through fields)?

(c) What are the types of leaks or location of leaks most likely missed with the handheld every 7 years approach discussed on page 62?
(d) Page 62 states: "Detected leaks are evaluated and assigned a relative risk level (safety), which is how repairs are triggered." How are leaks assigned a relative risk without there being any measurements? What information is used to characterise the leaks?
(e) How would a vehicle survey cover portions of pipelines that are not along roads?

Interrogatory # D-ED-16

These questions are for Highwood

Reference: Exhibit D, Tab 1, attachment 1

Question(s):

(a) Please reproduce the chart on page 77 with the annualized costs based on the lifetime of the equipment.
(b) Please provide a table showing the typical detection thresholds of the various detection methods with stated assumptions on factors such as speed, temperature etc.
(c) Please provide a table the range of detection thresholds of the various detection methods (i.e. high and low).
(d) For the figures shown on pages 79 to 82, do the percentages represent the *number* of leaks detected or the *cubic meters* of leaks that are stopped. If it is the number, please reproduce the figures with weighting by leak size.
(e) Please discuss the effectiveness of tower-based monitoring for urban areas.
(f) Page 89 describes the current method as "handheld walking survey using detection only gas analyzer." How does the modelled handheld approach differ in terms of equipment, steps taken, and detection threshold.

Interrogatory # D-ED-17

These questions are for Highwood and Enbridge

Reference: Exhibit D, Tab 1,

Question(s):

(a) Please see page 6 of this report: Hemati M, Mahdianpari M, Nassar R, Shiri H, Mohammadimanesh F. *Urban methane emission monitoring across North America using TROPOMI data: an analytical inversion approach.* Sci Rep. 2024 Apr 19;14(1):9041.[1]

[1] https://www.ncbi.nlm.nih.gov/pmc/articles/PMC11031598/pdf/41598_2024_Article_58995.pdf

Please confirm that it estimates that the methane emissions in Toronto are much higher (230.52) than those measured according to inventories (82.28).

(b) Please compare the results from the report in (a) with Enbridge data.
(c) This report estimates the emissions from pipelines in Toronto: *Investigation of the Spatial Distribution of Methane Sources in the Greater Toronto Area Using Mobile Gas Monitoring Systems.*[2] Please compare the results with Enbridge data.
(d) Does Highwood believe those papers to be authoritative?
(e) Please file a copy of those papers so they can be referred to on the record.

Interrogatory # D-ED-18

These questions are for Highwood.

Reference: Exhibit D, Tab 1, attachment 1

Preamble: These questions relate to the following paper: *Majority of US urban natural gas emissions unaccounted for in inventories.*[3]

Question(s):

(a) Please describe the paper's findings as they relate to emissions of un-combusted natural gas in cities.
(b) How would Highwood recommend that Enbridge overcome the undercounting of natural gas emissions discussed in this paper?
(c) Does Highwood believe this paper to be authoritative?
(d) Please file a copy of this paper so it can be referred to on the record.
(e) Page 93 of the Highwood study states: "As previously mentioned, the LDAR-Sim results must be caveated that the outputs are reflective of the inputs. Due to the lack of directly measured leak rates from EGI's distribution system, Highwood used literature values as inputs into the simulations. While those literature values were obtained through large-scale measurement campaigns on North American gas utility systems, and the results of the studies were either peer-reviewed or in pre-print review, there is a possibility that the LDAR-Sim results are not representative of EGI's actual leak profile." How would a general undercounting of natural gas emissions in impact the LDAR-Sim results?
(f) Please provide an description of how the LDAR-Sim results would change if the inputs were adjusted to reflect the findings of the paper noted above (i.e. the emissions were assumed to be higher).
(g) Please discuss the possibility of using tower, aerial, or satellite

Interrogatory # D-ED-19

These questions are for Highwood.

Reference: Exhibit D, Tab 1, attachment 1

[2] https://pubs.acs.org/doi/10.1021/acs.est.0c05386
[3] https://www.pnas.org/doi/full/10.1073/pnas.2105804118

Question(s):

(a) Page 95 includes 4 recommendations. Please provide a reasonable estimate of how long would be needed for recommendations 1, 2, and 3.

Interrogatory # D-ED-20

These questions are for Highwood.

Reference: Exhibit D, Tab 1, attachment 1

Question(s):

(a) Please discuss the possibility of using tower, aerial, or satellite data in large urban centres not for leak detection, but to provide top-down overall emissions rates as one factor to help to assess the accuracy of bottom-up estimates.
(b) Please discuss the cost of doing so.

Interrogatory # D-ED-21

These questions are for Enbridge.

Reference: Exhibit D, Tab 1, attachment 1

Question(s):

(a) Highwood provides details for each of its recommendations from pages 95 and 101. Please provide a list of any elements or aspects of those recommendation details the Enbridge is not proposing to follow.

Interrogatory # H-ED-22

Reference: Exhibit H, Tab 1, Schedule 1,

Question(s):

(a) Approximately when will the DCF+ test be completed and ready for use?
(b) Please provide a detailed description of the latest iteration of the draft DCF+ test.
(c) When considering IRPAs, will Enbridge offer interruptible rates discounts beyond the standard interruptible rate discounts? If yes, will the offer rates up to those corresponding to the cost of the avoided infrastructure?
(d) Please provide a description of the three most promising projects for a potential IRPA.
(e) What is Enbridge's best estimate of the year in which it will implement the next IRPA (aside from a pilot).