



# **ONTARIO ENERGY BOARD**

**IN THE MATTER OF the Ontario Energy Board Act, 1998, S.O.1998, c.15, Schedule B;**

**AND IN THE MATTER OF an application by Pembina Infrastructure and Logistics LP for a permit to drill hydrocarbon injection and withdrawal wells within the vicinity of the Moore 3-21-XII Designated Storage Area and to expand the storage capacity at the Corunna Storage Terminal;**

**AND IN THE MATTER OF Ontario Energy Board File Number EB-2015-0032**

## **Responses of Pembina Infrastructure and Logistics LP ("Pembina") to Interrogatories of Ontario Energy Board**

### **Interrogatory #1**

<b>Reference:</b>	Cover letter by Pembina, dated July 27, 2015 regarding the Risk Assessment and Geomechanical Assessment Filings
<b>Preamble:</b>	Pembina's proposed conversion project includes conversion of 11 unused caverns to storage. The letter referenced above indicates that the geomechanical assessments were completed between 1987 and 1994 and that the assessments were conducted for seven caverns.
<b>Question/ Request:</b>	<p>a) Please discuss what if any geological or operational changes have occurred since the geomechanical assessments were completed and if these changes impact the conversion and operations of the proposed project and adjacent Enbridge designated storage area.</p> <p>b) Does Pembina plan to complete an additional geomechanical assessment for the remaining non-assessed caverns?</p> <p>c) Please explain why Pembina is of the view that the geomechanical assessments filed for the seven caverns is sufficient evidence to support 11 caverns proposed for conversion?</p>
<b>Response:</b>	<p>a) In 2007, there was a roof fall in Cavern 59 that bent the tubing string. This was subsequently repaired and a Mechanical Integrity Test ("MIT") was performed. The MIT was successful and demonstrated continued integrity of the cavern.</p> <p>Operational changes to minimize operating caverns pressure changes to a timed gradual change of 600 kPa/hr increase and 400 kPa/hr decrease were implemented as a precaution to the cavern walls and roof and are meant to limit quick changes to pressures in the caverns. The cavern pressures are maintained between 4500 kPa and 6500 kPa on the hydrocarbon side and 0 to 1500 kPa on the brine side.</p> <p>The current expansion of the East field will add a continuously charged brine header that will run with a steady charge of brine on the caverns and minimize pressure fluctuation exposure.</p> <p>The operational and geological changes noted above do not impact the conversion and</p>



operations of the proposed project and adjacent Enbridge designated storage area.

- b) Yes - Pembina has been working with RESPEC Inc. to complete an additional Geomechanical Assessment for the entire Corunna Facility. This Geomechanical Assessment will include all of Pembina's current operating caverns as well as all the suspended caverns that are proposed in our Application to be converted into hydrocarbon storage and will include the following:

- Available historical data;
- Drilling and mining records;
- Work over reports; and
- Sonar's and mechanical integrity test reports.

RESPEC began this work in July 2015 and has committed to an approximately 9 to 12 week timeline for completion. Currently RESPEC plans to have it complete by end of August for submittal to the OEB and MNR in early September.

- c) As detailed in response (b) above, Pembina is undertaking an additional Geomechanical Assessment for the entire Corunna Facility to ensure continued due diligence and compliance of our Corunna Facility. In addition to this, Pembina's evidence to support 11 caverns proposed for conversion is as follows:

- The previous Geomechanical Assessments are performed by studying the geological formation of the field not just a single cavern. It is common practice to have one geomechanical study per operational field;
- Prior to submitting the Application, Pembina performed a Cavern Assessment of Pembina's suspended Caverns for Hydrocarbon Storage. This included reviewing cavern sonar's, location, S/D ratio and downhole configuration;
- In Pembina's Application, approval is being sought to utilize caverns that are currently sitting stagnant. Pembina is not requesting to change the geological formation by removing salt from it and mining new caverns; and
- The Corunna region and underling salt formations have been used for storing hydrocarbons for over 40 years. Historical data has proven that the salt formation in the area is tight and good for hydrocarbon storage. Pembina currently operates ten hydrocarbon storage caverns at the Corunna Facility, along with other companies in the same geological formation surrounding Corunna, successfully.

Pembina is aware that receiving approval of Pembina's Application is only the first step of converting caverns from a suspended state into hydrocarbon storage. Pembina will comply with the requirements of CSA Z341 Section 5.7 Well Conversion and will submit an Application for Conversion to Storage for each Proposed Cavern to the MNR. This secondary application process would occur prior to the introduction of hydrocarbon and bringing into service of each Proposed Cavern.

In conclusion, by completing all of the above referenced steps, Pembina is of the view that it has provided the OEB with sufficient evidence to receive approval of our Application.