

**NWMO Response and Action Plan for the
2013 Report of the Independent Technical Review Group**

January 2014

NWMO Response to the 2013 Report of the Independent Technical Review Group

The Board of Directors of the Nuclear Waste Management Organization (NWMO) established the Independent Technical Review Group (ITRG) to provide an independent review and assessment of the NWMO's Adaptive Phased Management (APM) Technical Program.

In September 2013, the ITRG held its annual review meeting (Sept 17/18) at NWMO offices in Toronto. The final 2013 ITRG report was presented in late fall 2013 to the NWMO Board (Dec 4) and Advisory Council (Nov 27). A NWMO response and action plan for the 2013 ITRG recommendations is outlined below.

ITRG 2013 Recommendations and NWMO Response & Action Plan

No.	ITRG 2013 Report Recommendation	NWMO Response & Action Plan
1	The ITRG understands that further development of repository sealing systems is planned: it recommends clarity on the integration of work between engineering design, safety assessment and geoscience in this area, where geoscience is important in relation to the disturbance of the rock caused by excavation and to the design and geometry of repository seals in order to minimise any pathway for inflows or releases afforded by an excavation disturbed zone (EDZ).	<p>Recommendation: Accepted</p> <p>The key elements of an integrated repository seal system program exist in the NWMO APM Technical Program. This includes, for example, URL based experimental programs examining sealing system performance at full scale, EDZ research focused on crystalline and sedimentary rock types and estimation of EBS material properties under expected long-term repository conditions. A working group will be established to improve integration of these work program areas in developing a safety case summary for repository sealing systems. In the long-term integration will be the responsibility of a designated Design Coordinator.</p> <p>Due Date: June 2014</p>
2	The NWMO clarified that the purpose would be to develop a facility at or near the ground surface in which various operational procedures could be tested and optimised. The ITRG recognises that this approach has considerable potential value in helping the NWMO to manage its project risk. It recommends that the scope of demonstration and testing to be carried out in such a facility should be explained very carefully to interested parties in order to constrain expectations and that the use of a term such as "facility to demonstrate underground operations" would be preferable.	<p>Recommendation: Accepted</p> <p>Clarification will be provided as to the specific purpose and objectives of the proposed near surface facility to demonstrate underground repository operations.</p> <p>Due Date: February 2014</p>

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3	<p>In the event that the NWMO evaluates that this will not fully meet its needs for supporting the thermodynamic modelling of solubilities and chemical speciation in highly saline groundwaters, the ITRG strongly recommends the NWMO should determine the radionuclides that are most significant to its emerging safety assessments of such systems. This would enable the NWMO to identify the gaps in existing thermodynamic databases (TDB), and to put in place the necessary work to fill those gaps on a suitable timescale to ensure the availability of a database that will support its safety assessment programme in this area.</p>	<p>Recommendation: Accepted Based on the outcome of TDB work undertaken in the APM Technical Program, an informed and focused approach will be devised in 2014 to assure that elements of a TDB necessary to support a repository safety case associated with high ionic strength fluids will be in place for 2016. To this end a plan will be developed for TDB preparation in 2014.</p> <p>Due Date: June 2014</p>
4	<p>The ITRG recommends that the NWMO should establish a clear context for its use of this model and for the geological and hydrogeological parameters that have been assigned to it. Given the continuity observed in the rock formations from investigations of the Paleozoic sedimentary rocks of Southern Ontario in support of the L&ILW DGR Project, in line with historical observations at the regional scale, the assigned properties appear to be reasonable.</p>	<p>Recommendation: Accepted The NWMO agrees clarity is required. The 5th Case Study represents a hypothetical sedimentary setting typical of that occurring in the Huron domain of Southern Ontario. The geosphere model including, geologic and hydrogeologic parameters, is based on local and regional scale evidence available in the public domain. Context for the model and properties assigned, including an acknowledgement of necessity for future site-specific verification is explicitly stated in Chapter 1 of the 5th Case Study report.</p> <p>Due Date: December 2013 (Complete)</p>
5	<p>The 5th Case Study has also explored the consequences of potential releases of non-radioactive contaminants, including copper dissolved from copper used-fuel containers into groundwater. The ITRG recommends that the NWMO should reconsider its modelling approach in this area. The modelling of dissolved copper concentrations in groundwater assumes that copper instantly dissolves up to its solubility limit rather than its dissolution being controlled by corrosion kinetics. This is almost certainly a highly pessimistic approach.</p>	<p>Recommendation: Accepted NWMO has reconsidered this model and believes it to be appropriate for the purpose of the 5th Case Study. Consistent with standard practice, this model would be reviewed and, if required, updated for future studies.</p> <p>Due Date: December 2013 (Complete)</p>

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6	<p>However, as the NWMO approaches design development and proof testing of EBS components at full scale, there is much useful information becoming available from international projects such as the European Commission supported LUCOEX, Large Underground Concept Experiments, Project, and the ITRG recommends that the NWMO should ensure that it benefits from all the lessons learned during this project¹.</p>	<p>Recommendation: Accepted The intent of the APM Technical Program is to collaborate and learn from international experience and demonstration projects related to full-scale implementation of EBS components and systems. The 2014 ITRG review will be provided with a NWMO program specific update of continuing and 2014 initiated international activities of relevance to EBS proof testing.</p> <p>Due Date: September 2014</p>

¹ www.lucoex.eu/deliverables.html accessed 28 October 2013