

## RE: HIGH LEVEL and INTERMEDIATE WASTE STORAGE

My major concerns are:

- if Australia takes HLW from other parts of the world, that HLW will continue to be produced and that a safe answer to its disposal will be postponed by another 60 years or never be adequately addressed.
- That the money to be spent over the 11-15 years to set up the repository, would be better spent on becoming leaders in the renewable boom that is taking place Worldwide.
- That the eventual cost will fall in the taxpayers' laps when/if an unforeseen incident occurs.

### Previous attempt

In 2001 Russia made it legal to import radio-active waste for storage, with the government citing hopes to generate \$20 billion from importing spent fuel. Large scale movement of waste did not occur, and in 2006 Russia's state nuclear corporation Rosatom announced it would not proceed with taking any foreign-origin used fuel.

"If Russia, with vast territory, a mature nuclear power industry, and experience with their own stockpiles of waste, could not establish a waste dump for profit, what chance does Australia have of succeeding in such an enterprise?"

[http://www.tai.org.au/system/files\\_force/P181%20SA%20nuclear%20royal%20commission%20submission%20FINAL\\_0.pdf?download=1](http://www.tai.org.au/system/files_force/P181%20SA%20nuclear%20royal%20commission%20submission%20FINAL_0.pdf?download=1).

<http://www.world-nuclear.org/info/Nuclear-Fuel-Cycle/Nuclear-Wastes/International-Nuclear-Waste-Disposal-Concepts/>

<http://www.theguardian.com/world/2001/apr/19/russia.ameliagentleman>

### CONTAINERS:

- Both Finland and Sweden have been unable to arrest corrosion of containers to be buried in the deep geological repositories.

"On 12<sup>th</sup> February 2015 [World Nuclear News](#) reported that Finland's radiation and nuclear safety authority (STUK) had given final approval to Posiva's application to construct a final repository and waste encapsulation plant....

In February 2015 Johan Swahn, Director of the NGO Office for Nuclear Waste (MKG) says:

"It is unfortunate that the Finnish regulator STUK went ahead with this decision. The proper action for them would have been to wait for a decision on the safety case of the parallel Swedish license application from the Swedish regulator SSM. **It is certainly true that there is a problem** for the industry in Sweden (SKB) and Finland (Posiva) **to show that the barrier system of copper canister and clay buffer will work** .... the Swedish review .... are still asking the Swedish industry for more information about for example copper corrosion issues....., but to accept a safety case where there is a growing uncertainty of the industry's fundamental scientific description of how copper and clay behaves in a repository environment is just not acceptable..... SKB is struggling in an up-hill battle to try and explain more and more evidence available that copper corrodes at much too high rates in a repository environment than the safety case assumes....."

<http://www.nuclearwasteadvisory.co.uk/news-and-events/finnish-approval-of-radwaste-repository-safety-case-pre-mature/>

"Finland is building state of the art storage at Olkiluoto. However, the Royal Institute of Technology in Stockholm found that the planned storage containers corrode one hundred times faster than they were de-signed to. "

<http://www.stralsakerhetsmyndigheten.se/Global/Publikationer/Rapport/Technical%20Note/2012/SSM-Rapport-2012-17.pdf>

<http://www.greenpeace.org/finland/Global/finland/p2/other/report/2010/nuclearWasteBriefing.pdf>

- This brings to question the safety of containers that leak during transportation over 1,000's of kilometres to Australia
- What happens to compromised containers on their arrival to an Australian port?

## TECTONIC and SEISMIC ACTIVITY

**“The Flinders Seismic Zone in South Australia is one of the most seismically active regions in Australia,** with earthquakes of magnitude up to M 6.5 recorded. Interestingly, this region lies within the South Australian Heatflow Anomaly, comprising some of the world’s highest concentrations of heat-producing elements (Chapter 10). Major fault displacements, with the uplift of the Mt Lofty Ranges to more than 700 m asl, are a testament to the **tectonic activity in this region.**”

<http://rses.anu.edu.au/~brian/PDF-reprints/2012/SN-chapter-2.pdf>

[http://jaeger.earthsci.unimelb.edu.au/msandifo/Publications/Manuscripts/Manuscripts/2005\\_Tectonics.pdf](http://jaeger.earthsci.unimelb.edu.au/msandifo/Publications/Manuscripts/Manuscripts/2005_Tectonics.pdf)

[http://cranswick.net/ARPANSA\\_Submission/GeoscienceAustralia2003c/10092003\\_How\\_big.jsp](http://cranswick.net/ARPANSA_Submission/GeoscienceAustralia2003c/10092003_How_big.jsp)

“Dr Mike Sandiford (2009) from School of Earth Sciences at University of Melbourne writes:

"Australia is relatively stable but not tectonically inert, and appears to be less stable than a number of other continental regions..... Australia is not the most stable of continental regions, although the levels of earthquake risk are low by global standards. To the extent that past earthquake activity provides a guide to future tectonic activity, Australia would not appear to provide the most tectonically stable environments for long term waste facilities. However,..... other factors such as the groundwater conditions, need to be evaluated in any comprehensive assessment of risk.”

<http://www.choosenuclearfree.net/wp-content/uploads/2010/11/cnf-waste-web-long.pdf>

<sup>11</sup> The most seismically active areas of South Australia are associated with the Adelaide Geosyncline in an area extending from the Flinders Ranges in the north to Kangaroo Island in the south; the eastern portion of Eyre Peninsula; .....The area between Quorn and Leigh Creek has the highest number of seismic events In Eyre Peninsula the earthquakes appear to be associated with the Lincoln Fault Zone, the highest recording being the 1959 Mambin earthquake of magnitude  $M_L$  4.9

Main Report of the EIS (Environment Assessment, Chapter 8, Physical Environment, 8.1.3 Seismicity, p. 157)

- Minor earth tremors can change the lie of underground geological formations, hence the flow of underground water systems giving rise to increased canister erosion and potential water pollution with radioactive toxic wastes.

“The ground water aquifers that lie below the Gawler Craton and the Adelaide Geosyncline consist of: Fractured rocks – Cambrian and Precambrian rocks – quartzite, sandstone, limestone, dolomite, slate, marble, siltstone, phyllite, schist and gneiss.” <http://location.sa.gov.au/viewer/?map=hybrid&x=139.51294&y=-33.34726&z=6&uids=145#>

- Fractured rocks much more likely to shift in a seismic/tectonic event.

## INADEQUATE INFRASTRUCTURE DETERMINATION

The last sentence of the “Seismicity” section of the EIS is, “The repository and buildings would be designed in accordance with AS 1170.4-1993.” However, the abstract of the AS 1170.4-1993 states (Standards Australia, 2003):

“Sets out data and procedures for determining minimum earthquake loads on structures and their components, and also minimum detailing requirements for structures. It does not consider related phenomena such as settlement, slides, subsidence, liquefaction or faulting in the immediate vicinity of a structure. It does not include nuclear reactors, dams, transmission towers, bridges, piers and wharves, which may require special consideration. The Standard is in limit states format. New earthquake maps are defined in terms of an acceleration coefficient instead of the zoning system used in the previous Standard AS 2121. Domestic structures are now included” . [http://cranswick.net/ARPANSA\\_Submission/index.htm](http://cranswick.net/ARPANSA_Submission/index.htm)

<http://www.standards.com.au/Catalogue/script/Details.asp?DocN=stds000010445>