



## **Supplementary Information**

### **Presentation from the Concerned Citizens of Renfrew County and Area**

In the Matter of

**Saskatchewan Research Council,  
SLOWPOKE-2 Reactor**

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Request by the Saskatchewan Research Council to authorize the decommissioning of the SLOWPOKE-2 reactor

**Commission Public Hearing**

**September 26, 2019**

## **Renseignements supplémentaires**

### **Présentation de Concerned Citizens of Renfrew County and Area**

À l'égard de

**Saskatchewan Research Council  
Installation nucléaire SLOWPOKE-2**

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Demande du Saskatchewan Research Council afin d'autoriser le déclassement du réacteur SLOWPOKE-2

**Audience publique de la Commission**

**Le 26 septembre 2019**

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# Decommissioning and Nuclear Waste

Presentation for the CNSC's Saskatchewan Research  
Council SLOWPOKE-2 decommissioning hearing

September 26, 2019, 1:00 pm

Ole Hendrickson  
Concerned Citizens of Renfrew County and Area

# Why would we care about a small Saskatchewan reactor?

- Most of the SRC reactor decommissioning waste is destined for storage, and possible eventual disposal, at the Chalk River Laboratories (CRL), located in the Ottawa Valley; and
- Incomplete decommissioning of the SRC SLOWPOKE-2 could set a poor precedent for other reactors awaiting decommissioning, such as the shut-down NRX and NRU reactors at CRL.

# Fate of radioactive waste from SRC SLOWPOKE-2 decommissioning\*

- To be transported to Savannah River Site (U.S.)
  - Nuclear fuel waste (3.6 kg, 11,000 GBq)
- To be transported to Chalk River Laboratories
  - Beryllium reflector assembly (71 kg, 27 GBq)
  - Lower reactor container, irradiation tubes, control rod (59 kg, 1.3 GBq)
  - Cleaning equipment or materials (100-200 kg)
- To be buried on site
  - Concrete reactor pool
- To be discharged to sewer
  - Reactor pool water

\*Source: SRC Slowpoke Decommissioning Waste Management Plan

# Radioactive waste production

- U-235 releases neutrons and alpha particles, and generates new actinides in fuel (25 products listed)\*
  - Pu-239, Np-237, U-234, Pu-240, etc.
- Fission of U-235 and Pu-239 (191 products listed)\*
  - Cs-137, Sr-90, Y-90, Ba-137m, etc.
- U-235 releases neutrons and activates reactor components (metal, concrete, air, water)\*
  - Beryllium shims: Co-60, H-3, Sc-46, Ce-144, etc.
  - Lower reactor container: Co-60, Fe-55, Cr-51, Ni-63, etc.
  - Concrete and rebar: Eu-152, Sc-46, Cs-134, etc.

\*Sources: SRC SLOWPOKE Decommissioning Waste Management Plan, SRC SLOWPOKE-2 Detailed Decommissioning Plan

# Missing from the Detailed Decommissioning Plan

- Lighter, mobile, difficult-to-measure, long-lived radionuclides in the concrete reactor pool
  - tritium (hydrogen-3): 12.3 year half-life
  - carbon-14: 5730 year half-life
  - chlorine-36: 301,000 year half-life
  - calcium-41: 99,400 year half-life

Burying these radionuclides on site (reactor entombment) without measuring them could create a permanent, unlicensed radioactive waste disposal facility

# Also missing from the Detailed Decommissioning Plan

- Types of radiation (alpha, beta, gamma) emitted by the decommissioning wastes;
- Half-lives of the radionuclides in the wastes;
- The potential mobility of these radionuclides in the environment; and
- Their uptake by humans.

The focus is on waste transport containers. No consideration is given to long term waste management or disposal.