Canadian Nuclear Safety Commission | Commission canadienne de sûreté nucléaire

CMD 22-H7.89A

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Supplementary Information

Renseignements supplémentaires

Presentation from Gursimer Sandhu

Présentation de Gursimer Sandhu

In the Matter of the

À l'égard des

Canadian Nuclear Laboratories (CNL)

Laboratoires Nucléaires Canadiens (LNC)

Application from the CNL to amend its Chalk River Laboratories site licence to authorize the construction of a near surface disposal facility

Demande des LNC visant à modifier le permis du site des Laboratoires de Chalk River pour autoriser la construction d'une installation de gestion des déchets près de la surface

Commission Public Hearing
Part 2

Audience publique de la Commission
Partie 2

May 30 to June 3, 2022

30 mai au 3 juin 2022

Canada

NSDF Intervention

22-H7.89 - Gursimer Sandhu

Who am I?

- B. Sc., Health Physics and Radiation Science, UOIT
  - Nuclear Theory – Reactor Kinetics, Radiation Detection
  - Radiological effects of human health - Biophysics, Dosimetry
- Characterization Specialist, CNL, 5 years
  - Planning, Sampling, Analyzing, Reporting
  - Interpretation of CNSC Regulations
  - Application of Industry standard techniques
- Professor, Algonquin College, 2 years
  - Applied Nuclear Science and Radiation Safety
    - Radiological Waste : Disposal, Storage, and Decommissioning
- Ottawa Valley Resident, Petawawa, 5 years
  - Outdoor Activities (Soccer, Beach, Running, Biking)

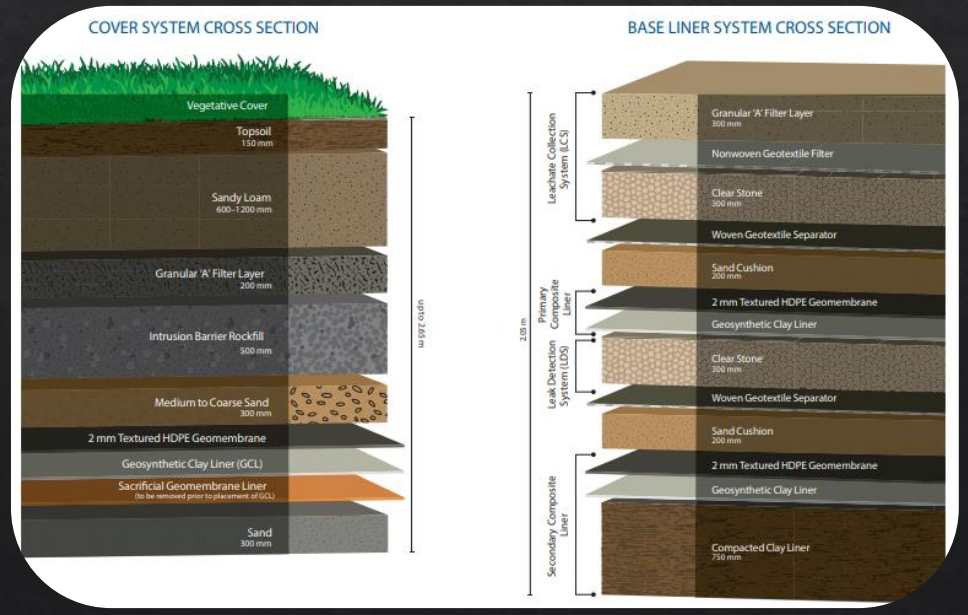
Topics

- Health Safety and Security
- Environmental Impacts of LLW
- Implications to the future of CNL
- Responsible use of government funding by CNL
- Responsible disposal of nuclear waste

Health Safety and Security

- Low Level Waste only
  - As defined in the NSDF Waste Acceptance Criteria[1]
- Multilayered Geomembrane Design[2]
  - Rigorous testing at Queen's University
  - Intact for a thousand years
- Waste Water Treatment
  - Proven system
- Institutional controls and supervision
  - 100s of years

Limits for Leachate Controlled Packaged Waste	400 Bq/g for α emitting radionuclides 10,000 Bq/g for long-lived βγ emitting radionuclides ($t_{1/2}$ >Cs-137) 10,000 Bq/g for Cs-137 10,000 Bq/g for Sr-90 10,000,000 Bq/g for H-3



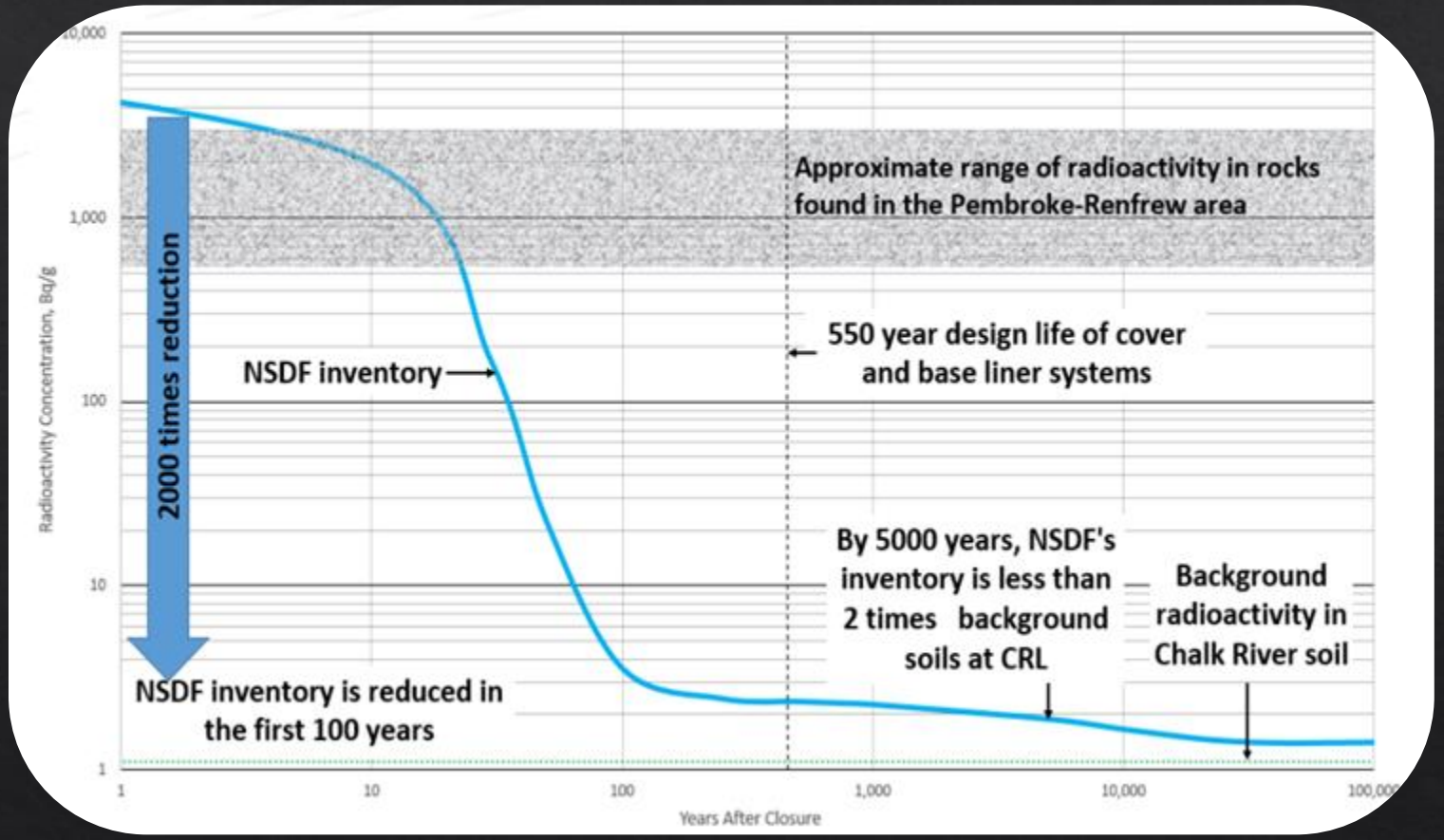
[1]https://www.cnl.ca/wp-content/uploads/2021/03/Near-Surface-Disposal-Facility-Waste-Acceptance-Criteria-Rev-4_EN.pdf
[2]http://www.cnl.ca/wp-content/uploads/2021/12/Press-kit-NSDF-English.pdf

Environmental Impacts of LLW

- Naturally Occurring Radioactive Materials (NORM)[3]
  - Cosmic, Terrestrial, Primordial, Cosmogenic
- NSDF Significant Radionuclides
  - Radiation Dose
    - External – Co-60 (88.48%), Cs-137 (11.51%), Others (<0.01%)
    - Ingestion – Cs-137 (66.16%), Co-60 (33.13%), Sr-90 (0.34%), H-3 (0.20%), Am-241 (0.07%), Others (0.09%)
    - Inhalation – Co-60 (52.36%), Cs-137 (34.40%), Am-241 (5.70%), Sr-90 (0.34%), H-3 (0.22%), Others (6.99%)

[3]Cooper, John R., Radioactive Release in the Environment, 2003

Environmental Impacts of LLW



Implications to the Future of CNL

- Employment
- Local Infrastructure
  - Roads, Internet
- Economic Boost

Responsible Use of Government Funding

- In-House Waste Management
  - Generators – Waste Receivers
    - Operator knowledge
    - On-site packaging
- Proprietary Knowledge
  - Business Development
  - Canadian Research

Responsible Disposal of Nuclear Waste

- Health
  - Low Level Waste
- Safety
  - Facility Design
- Finance
  - Optimized Business Model