

Protecting the Environment

Canadian Nuclear Laboratories

CNL has more than 60 years of experience conducting monitoring programs for vegetation and wildlife (e.g. vegetation, soil and sediments and game animals), water quality (e.g., drinking water, waterborne effluent, groundwater, sediments) and air quality (e.g., ambient air, airborne effluents).

The results of the radiological and non-radiological effluent monitoring program demonstrate that controls for the release of potentially hazardous substances currently in place at Whiteshell Laboratories (WL) continue to provide substantial protection of the environment. The monitoring program confirms that the WL site is operating in a manner that protects workers, the public and the environment.

We are committed to providing information on environmental performance. Reports with data from the WL site can be found on www.cnl.ca.

>130 locations monitored
>18,000 analyses performed annually



Designing a monitoring program

IDENTIFY POTENTIAL ENVIRONMENTAL RISK

- Environmental risk assessment
- Human health risk assessment
- Environmental assessment (EA)
- Other

DETERMINE NEED TO MONITOR

- Is there a potential risk?
- Is there a regulatory or licensing need?
- Are stakeholders concerned?
- In order to confirm the predictions of the EA

DESIGN PROGRAM

- Environmental components to monitor
- Locations to monitor
- Parameters to monitor
- Frequency of monitoring

MONITOR

- Sampling and analysis
- Quality control
- Quality assurance
- Interpret results
- Compare to limits
- Prepare reports

CNL designs the monitoring programs in compliance with Canadian standards.

The Canadian Standards Association's (CSA) criteria provide guidance on derived release limits, environmental risk assessment (ERA) and environmental, effluent and groundwater monitoring and protection programs.





Regulatory Oversight Canadian Nuclear Laboratories

In order for the projects to go forward, regulatory approvals are necessary

Regulatory Approvals

For the project to go forward, two main regulatory approvals are required:

- 1) An Environmental Impact Statement (EIS) will be submitted under the *Canadian Environmental Assessment Act* (CEAA) 2012. The EIS will assess the potential environmental effects of the project and will include stakeholder engagement and Aboriginal engagement.
- 2) A licence amendment (in conjunction with licence renewal) under the *Nuclear Safety Control Act* (NSCA) is required. The amendment application will include the following component:

- Request for a licence amendment for the change to the decommissioning plan for WR-1 Reactor Building

A decision of approval under CEAA 2012 is required before a decision can be made under the NSCA

WR-1 In Situ Decommissioning

CEAA 2012 Requirements*

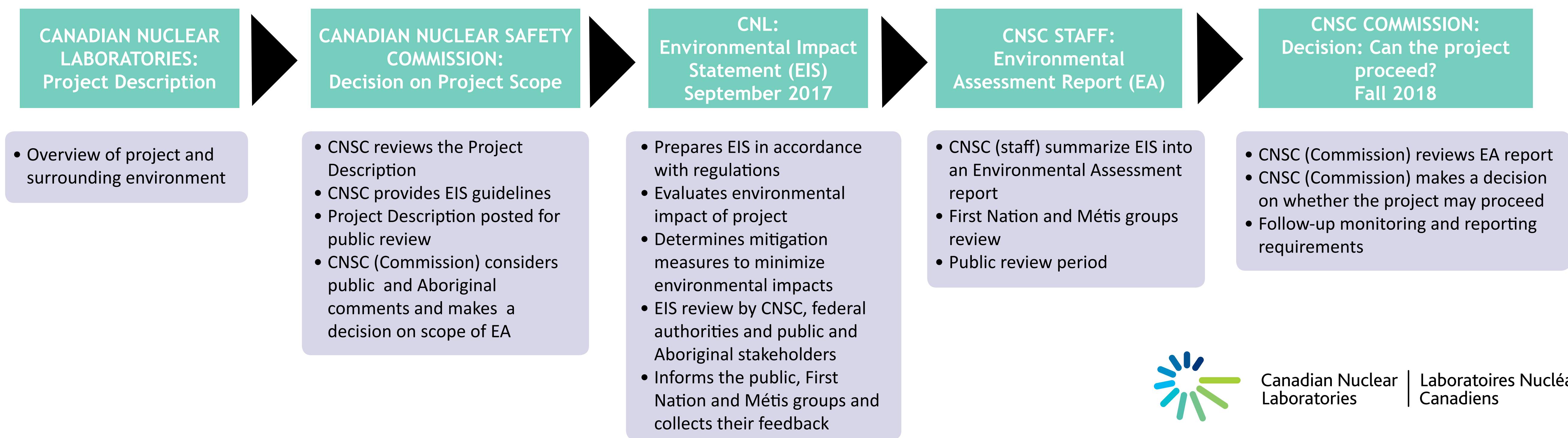
- Environmental Assessment (includes, Environmental Impact Statement, Stakeholder Engagement and Aboriginal Engagement)
- WR-1 in situ decommissioning safety assessment report

NSCA Requirements*

- Request for licence amendment to perform in situ decommissioning of WR-1
- Revised Whiteshell Overview Detailed Decommissioning Plan

* There are also other requirements beyond those listed.

Environmental Assessment Process



Safe by Design WR-1 Decommissioning

Ensuring the wellbeing of future communities through planning for normal evolution and disruptive scenarios



What is a Post-Closure Safety Assessment?

A Post-Closure Safety Assessment is an assessment to demonstrate understanding of the waste management system through a well-structured, transparent and traceable methodology.

A Post-Closure Safety Assessment will provide a quantitative assessment of the post closure radiological and non-radiological safety of the in situ decommissioning of WR-1.

It will also identify the uncertainties or potential events that have the greatest potential impact on the long-term performance of the in situ decommissioning.

Normal evolution

Normal evolution is the expected long-term evolution of the WR-1 site following closure. It is the scenario that is predicted based on reasonable extrapolations of present-day site features and receptors' lifestyles. This includes the site's expected degradation with time.

Disruptive scenarios

Disruptive scenarios refer to events or situations unlikely to occur but which lead to the possible penetration of barriers and abnormal loss of containment. The following are being assessed:

- Early degradation of grout
- Early glaciation
- Digging a well
- Human intrusion
- Site investigation



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Public Engagement *WR-1 Decommissioning*

At public information sessions and community events, on the telephone and by email, you provided your thoughts and opinions on the project. Several comments have also been registered with the CNSC and the Canadian Environmental Assessment Agency (CEAA) website.

Knowing what you value helps us assess how to protect or mitigate any potential impacts the project could have on the environment.

This is how you inform the environmental assessment and our planning.

Feedback from the public, First Nations and Métis, local governments and stakeholder groups throughout project development and project environmental assessment will be considered, along with technical and financial information, as the project team refines project design and develops mitigation measures.

Announcement
of Project
May 2016

Preliminary
engagement
Summer 2016
Gathering feedback

Round one
engagement
Fall 2016
*Understanding
interests and
concerns*

Round two
engagement
Winter 2017
*Preliminary
results & mitigation*

Submittal of
Environmental
impact
statement
Fall 2017

Provide us with your feedback by:

Completing a feedback form and leaving it with our team.

Contact Us!

Email: communications@cnl.ca

Telephone: 1-800-364-6989

www.cnl.ca/wr-1



Twitter: @CNL_LNC



Facebook: @CanadianNuclearLaboratories

What is important to you? *Let us know*

Land and Resources Use

- Land and resource use tenures
- Focal areas for public recreation and tourism activity

What we heard...

Land and Resources Use for Traditional Purposes

- Traditional land use activity
- Cultural site

Aquatic

- Fish
- Fish habitat

Sediment Quality

Air Quality

Public Safety

Socioeconomics

- Employment and income
- Business and economic development
- Government finance
- Housing, services and infrastructure
- Community wellbeing
- Public safety

Terrestrial Biodiversity

- Migratory birds

Surface Water Quality and Quantity

Groundwater Quality and Quantity

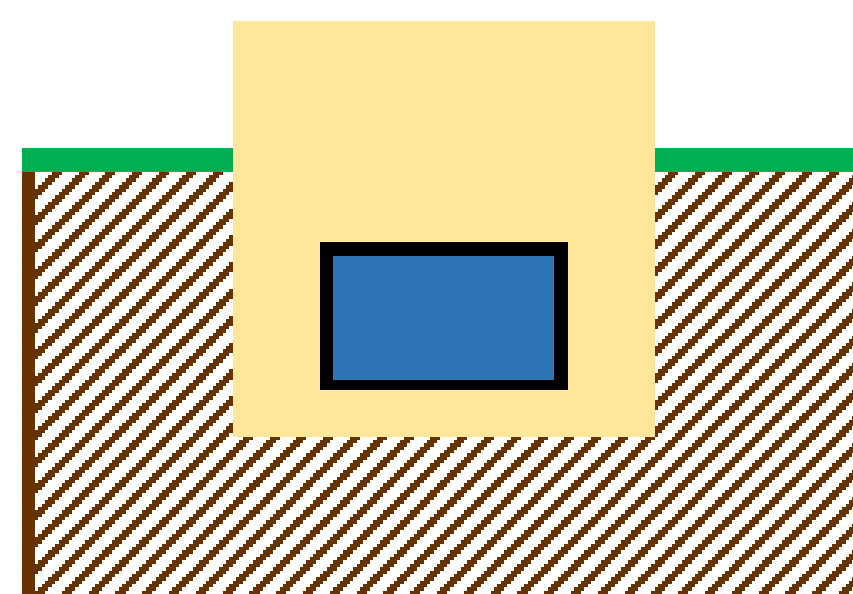


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WR-1 Decommissioning Alternative Means

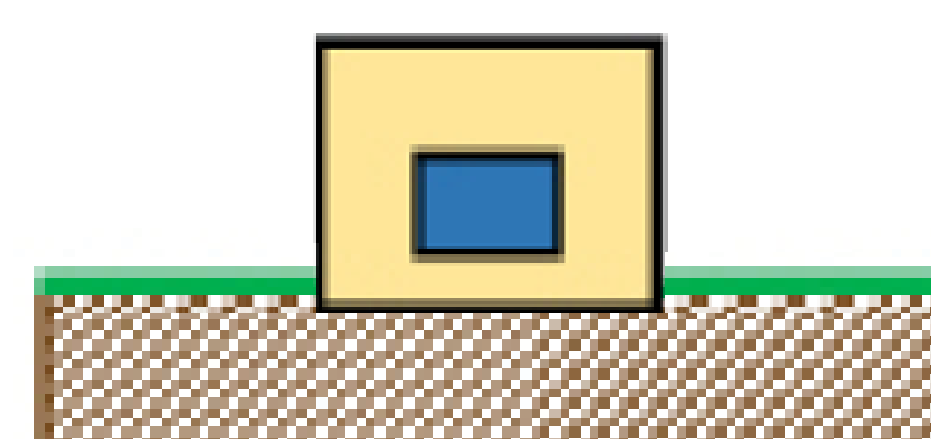
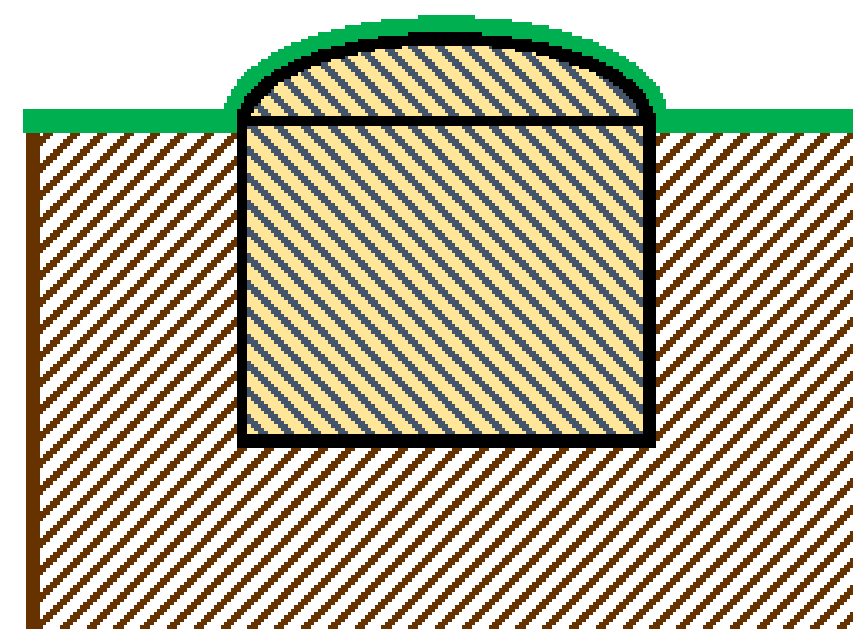
Continued Storage with Surveillance

Continued Storage with Surveillance (SWS) for 45 years or more.
In Situ Decommissioning following SWS.



Partial Dismantling and Removal

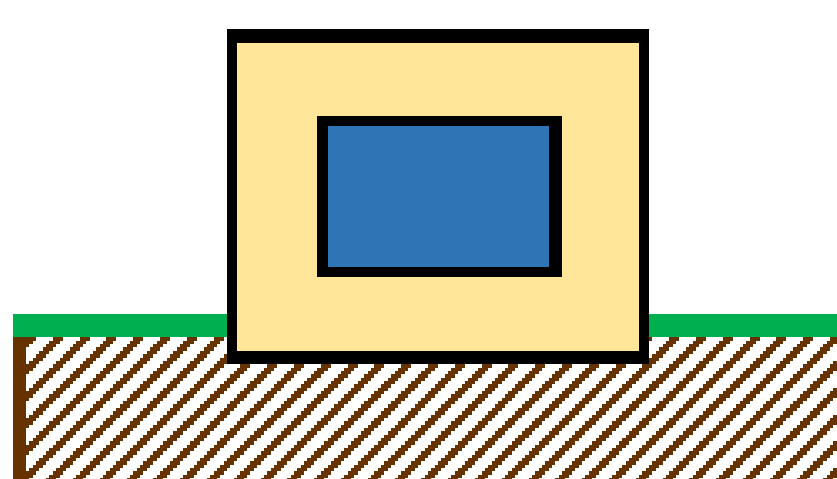
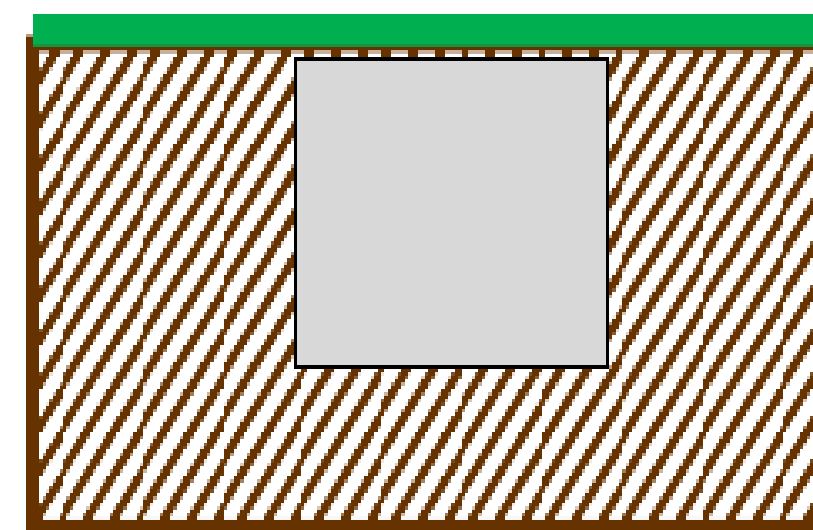
Greater risk of contamination or radiation exposure to workers during decommissioning activities and transport of waste off site.



Disposal of waste off site

Complete Dismantling and Removal

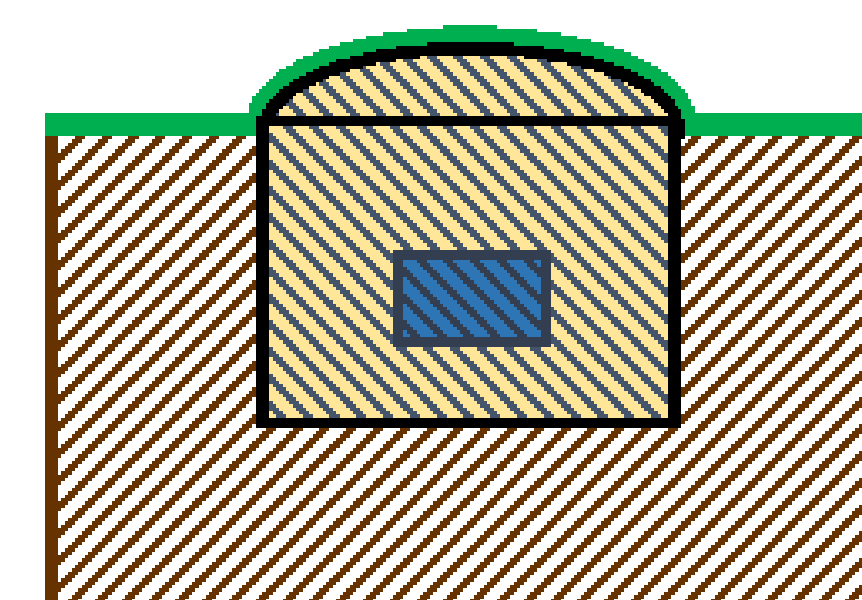
Greater risk of contamination or radiation exposure to workers during decommissioning activities and transport of waste off site.









Disposal of waste off site

In situ Decommissioning

Greater environmental monitoring requirements into the future.



-  Low level radioactive material
-  Reactor systems and components
-  Ground

-  Grouted low level radioactive material
-  Grouted reactor systems and components
-  Grass

-  Zero activity structure

Key Objective:

Safe and timely disposition of Canada's nuclear legacy liability

WR-1 Building Quick Facts:

- Footprint of WR-1 reactor hall 633 m² (an NHL Hockey rink is 1586 m²)
- 17.8 m below grade
- Exterior wall 60 cm thick
- Reactor vessel 5 m high 2.7 m across with 2.1 m thick wall



What do you think?

WR-1 Decommissioning

Valued components (VCs) are environmental features that may be affected by a project and that have been identified to be of concern by:

- the proponent
- government agencies
- First Nation and Métis groups
- the public

The value of a component not only relates to its role in the ecosystem, but also to the value people place on it. For example, it may have been identified as having scientific, social, cultural, economic, historical, archaeological or aesthetic importance.

VC selection is based on the potential project-environment interactions in various environmental components.

What do you value?

Let us know

- Grab a comment card and fill it out.
- Use the marker attached to this poster and mark an X next to what is important to you on this poster.
- Or write down what's missing in the bottom of this poster.

Contact us!

For more information or to share your thoughts on the Valued Components, related to this project, contact us:

Email: communications@cnl.ca

Telephone: 1-800-364-6989

www.cnl.ca/WR-1



Twitter: @CNL_LNC



Facebook: @CanadianNuclearLaboratories

Valued Components Identified for the WR-1 in situ decommissioning

Land and Resource Use

- Winnipeg River
- Land Tenure
- Outdoor Recreation
- Tourism
- Cultural sites
- Traditional land



Ecological Health

- American Robin
- Barn Swallow
- Loggerhead Shrike
- Grass and shrubs
- Blueberries
- Meadow Vole
- Common shrew
- Snowshoe Hare
- White-tailed Deer
- Red Fox
- Little Brown Myotis
- Northern Myotis
- Canada Warbler
- Snapping Turtle
- Invertebrates
- Horned Grebe
- Trumpeter Swan
- Mallard
- Mink

Socio-economic

- Employment
- Income
- Business opportunities
- Government finances
- Community infrastructure
- Community services
- Community well-being
- Public safety

Human Health

- Worker health
- Public health

Aquatic

- Carmine Shiner
- Lake Sturgeon
- Walleye
- Aquatic plants
- Invertebrates
- Fish & Fish Habitat



Atmospheric Environment

- Air quality
- Greenhouse gases



Physical Environment

- Geology
- Hydrogeology

What's missing? Write it down.



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Decommissioning Solution

WR-1 Decommissioning



Why in situ decommissioning?

In situ decommissioning has been selected as the proposed decommissioning technique as it provides the following advantages:

- Reduced risk for radiological and industrial hazards exposure to workers
- Reduced transport/waste handling risks to the public and environment
- Effective reduction of the nuclear liability and eliminating interim waste storage
- Eliminates the risk associated with multiple handling of waste packages to and from interim storage and final disposal
- Allows for early release of non-impacted WR-1 property
- Reduced cost to Canadian tax payers

In situ decommissioning requires additional long-term monitoring of the impacted area.

