



Supplementary Information

Presentation from Canadian Nuclear Laboratories Ltd.

In the Matter of the

Whiteshell Laboratories

Application to renew the Nuclear Research and Test Establishment Decommissioning Licence for the Whiteshell Laboratories site for a period of ten years

Commission Public Hearing

October 2-3, 2019

Renseignements supplémentaires

Présentation des Laboratoires Nucléaires Canadiens Ltée

À l'égard des

Laboratoires de Whiteshell

Demande pour le renouvellement, pour une période de dix ans, du permis de déclassement d'un établissement de recherche et d'essais nucléaires pour les Laboratoires de Whiteshell

Audience publique de la Commission

Les 2 et 3 octobre 2019

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Whiteshell Decommissioning Licence Renewal

Mike Gull | Vice-President, Environmental Remediation Management, CNL

OCTOBER 2, 2019



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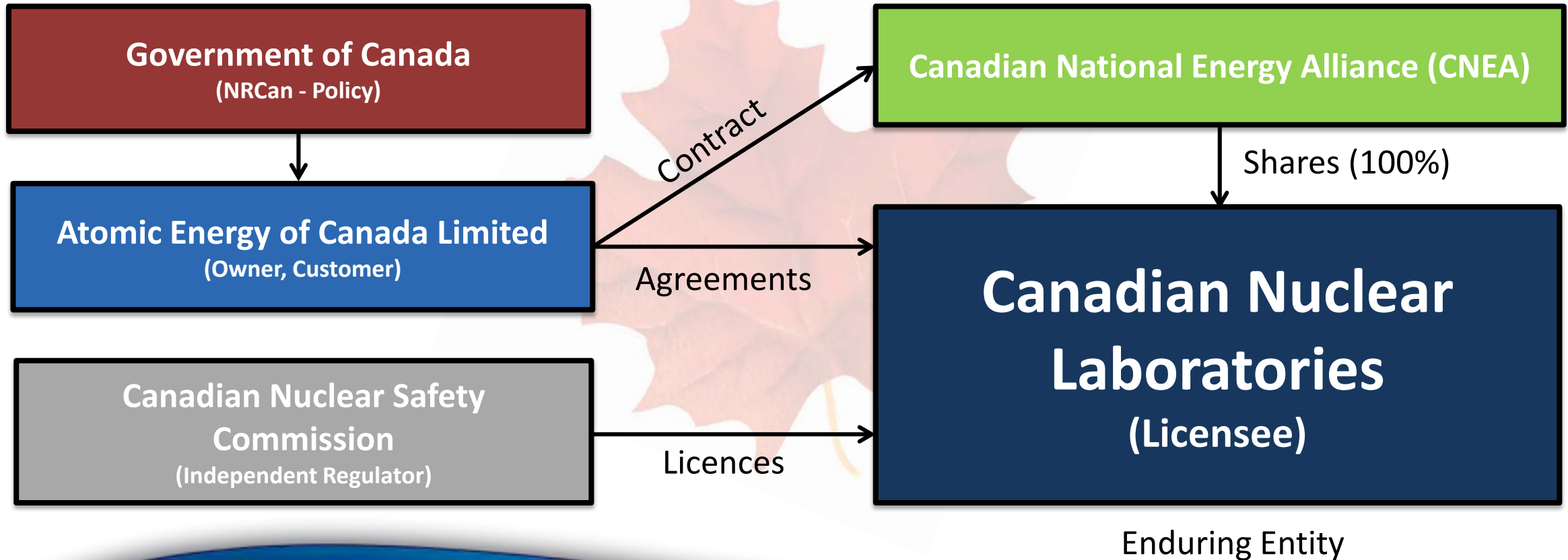
Agenda

- Introductory remarks
- Decommissioning Progress (2009 – 2019)
- CNL Plans for Next Licence Period
- Whiteshell Laboratories Safety & Performance
- Concluding Remarks



GoCo Management Model

Operation of Canada's National Nuclear Laboratory



Canadian Nuclear Laboratories

CNL Mandates

- Reduce Government of Canada nuclear legacy & historic waste liabilities
- Leverage CNL's Science & Technology capabilities
- Rebuild facilities and supporting infrastructure at Chalk River Laboratories

Whiteshell Vision

- To help CNL be the preferred supplier of decommissioning expertise in Canada through our people, practices and innovation

Whiteshell Mission

- To safely and efficiently decommission the Whiteshell Laboratories site using sound environmental and waste management practices while optimizing value for the Canadian public



CNL has an **absolute commitment** to safety and the environment!

CNL has **operated safely** during the current licence period, and has made improvements that will **continue to enhance** safety.

CNL **will continue** to meet its regulatory obligations during the proposed licence period.

Whiteshell Laboratories Closure Project

Waste Management Area and Concrete Canister Storage Facility



**CONCRETE CANISTER
STORAGE FACILITY**

WASTE MANAGEMENT AREA



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Whiteshell Laboratories Closure Project

Waste Management Area Location



MAIN CAMPUS

~2.5KM

WASTE MANAGEMENT AREA



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Whiteshell History

- Established by AECL in early 1960s
- Whiteshell Reactor-1 (WR-1)
- Hot cells to support research
- Concrete canister development
- Research into deep geological disposal for spent fuel
- Reactor safety program
- SLOWPOKE Demonstration Reactor
- Approximately 11,000 acres in size





Licence History & Timeline

- WL operates under decommissioning licence granted by CNSC in 2003 & 2009
- CNL received one-year renewal under same terms of 2009 licence (expires 2019 December 31)
- Requesting 10 year licence through 2029
- CNL targeting to complete all WL decommissioning activities by 2027
- WR-1 in situ decommissioning out of scope for requested licence



Whiteshell Main Campus

Circa 2014



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Whiteshell Main Campus

2019



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Whiteshell Main Campus (Final End-State)

~ 2027



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Decommissioning Progress (2009-2019)

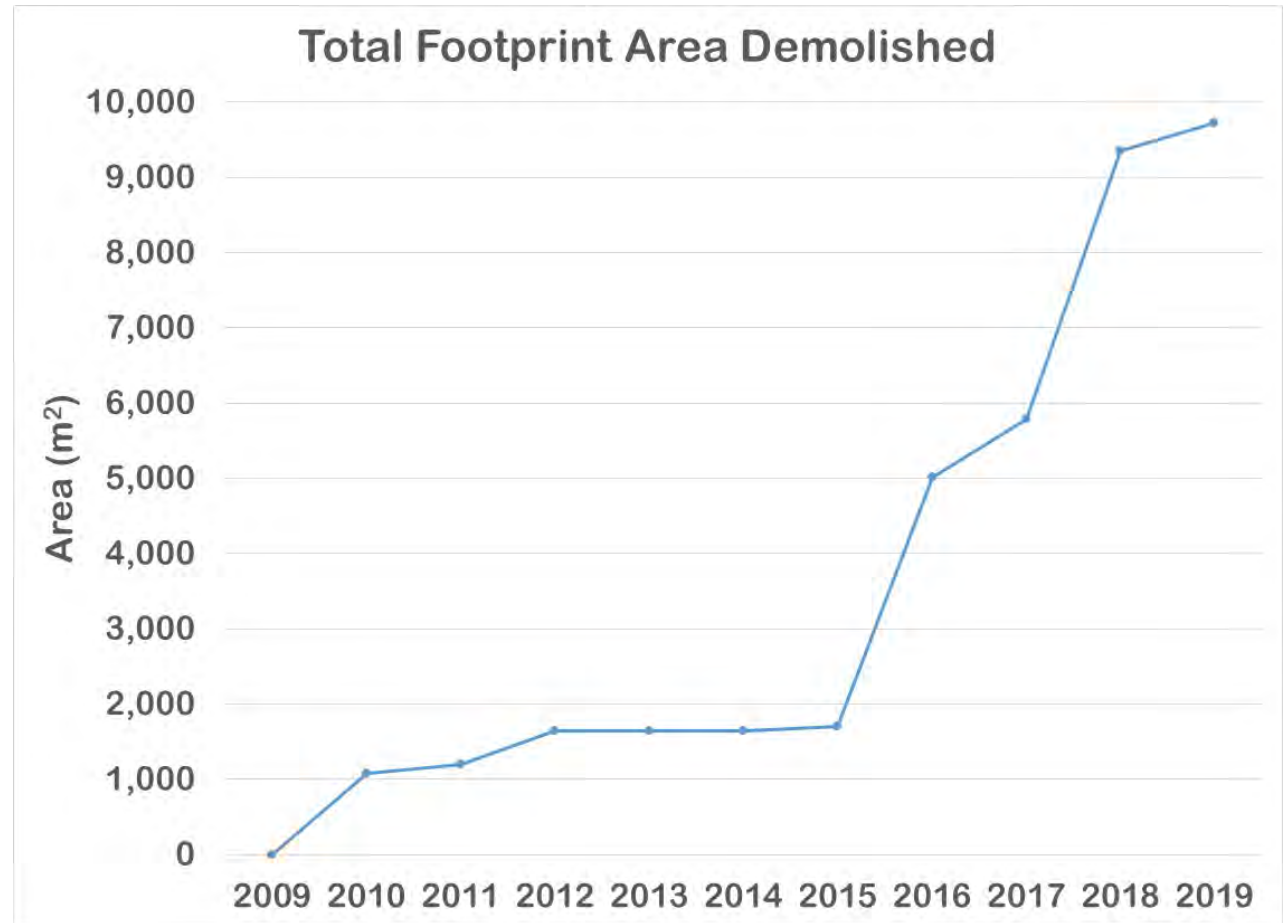
John Gilbert | General Manager & Site Licence Holder, Whiteshell Closure Project



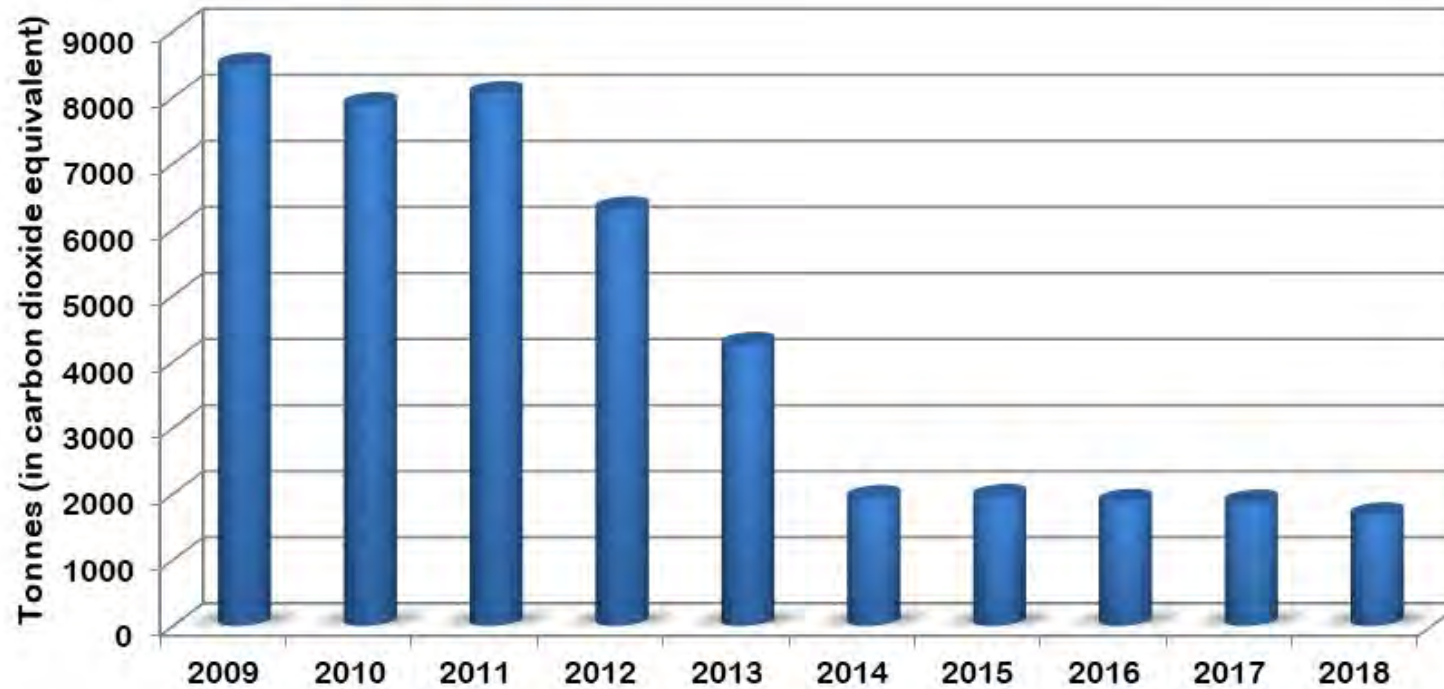
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Buildings & Structures Demolished in Last Licence Period

Whiteshell Main Campus



Whiteshell Greenhouse Gas Emissions



Building 300: R&D Facility Demolition

Stage 4 & 7 Demolition completed in 2016



STAGES 4 & 7 PRE-DEMOLITION



DEMOLITION COMPLETE



Building 411: Decontamination Center Demolition

Demolition performed in 2017



Non-Nuclear Buildings Demolition

2018 and 2019



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Active Liquid Waste Treatment Center Decommissioning

2018-2019





CNL Plans for Next Licence Period



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Whiteshell Laboratories Decommissioning

Planned Project Schedule

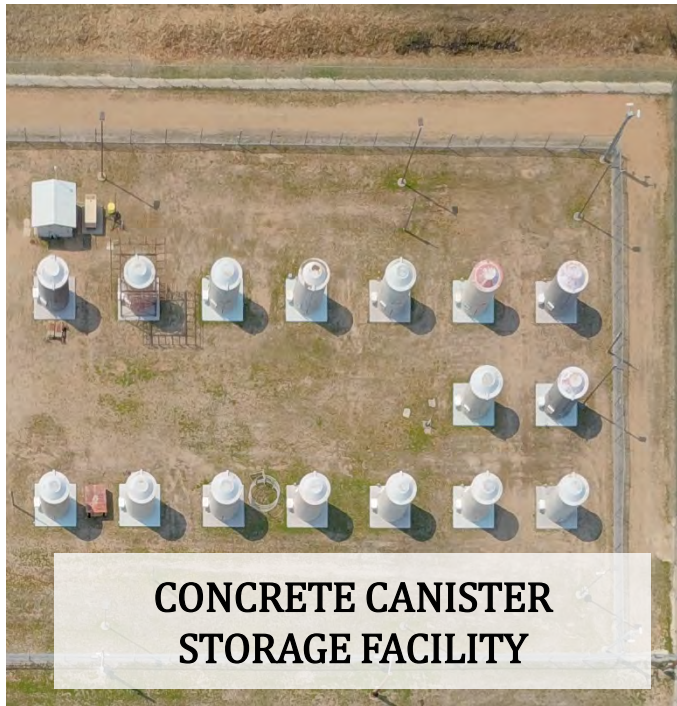
FY 2019/20	FY 2020/21	FY 2021/22	FY 2022/23	FY 2023/24	FY 2024/25	FY 2025/26	FY 2026/27
	B303/303 Annex, B304		Inactive Landfill		B405, B412, B422, B902, B903, B911		B401, Sewage Lagoon
B100 / WR-1 Reactor					B402		
B300 Stage 6		B300 and Shielded Facilities					
B200							
Waste Management Area							
	Concrete Canister Storage Facility						
SHIPMENTS FROM WMA							

Legend:

- Non Nuclear Building
 - Nuclear Building (main campus)
 - Waste Management Area / Concrete Canisters
- FY - fiscal year

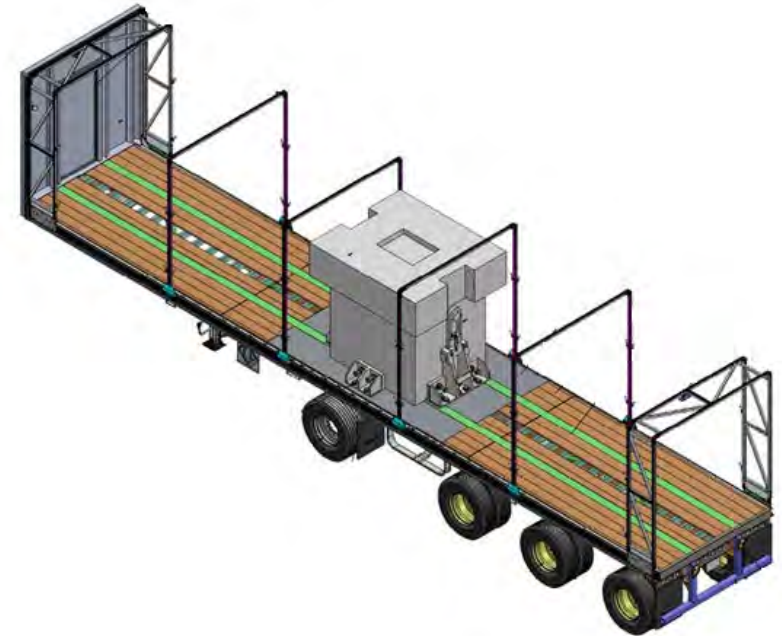
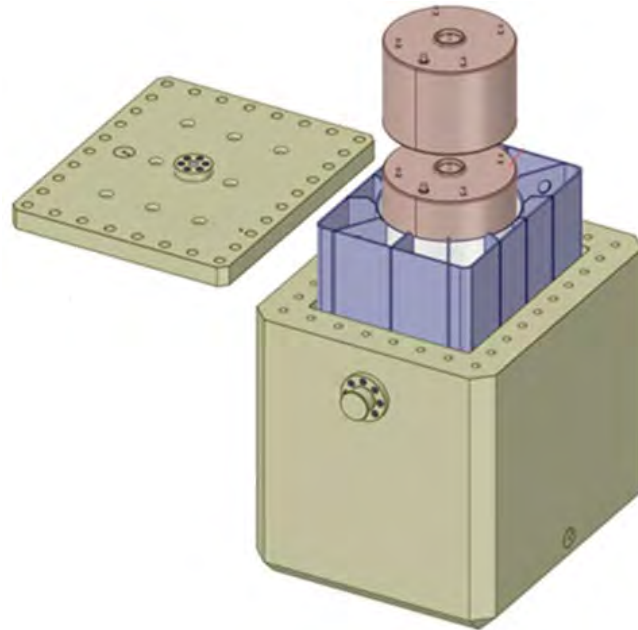
Decommissioning Concrete Canister Storage Facility

Transfer Used Fuel to Chalk River



Decommissioning Concrete Canister Storage Facility

Used Fuel Transportation Package (UFTP)



Decommissioning of the Waste Management Area

Transfer SMAGS and Low-Level Waste Bunker contents to Chalk River



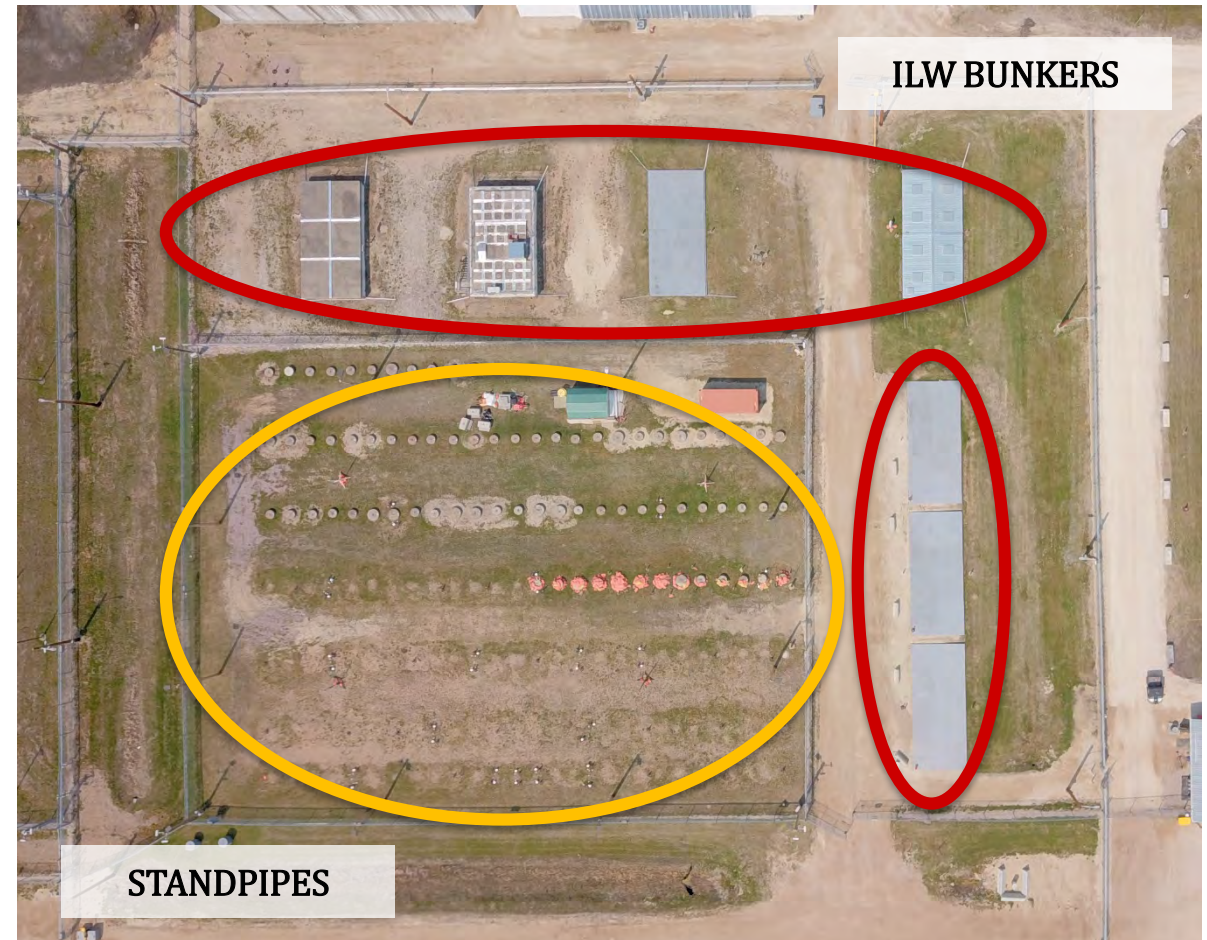
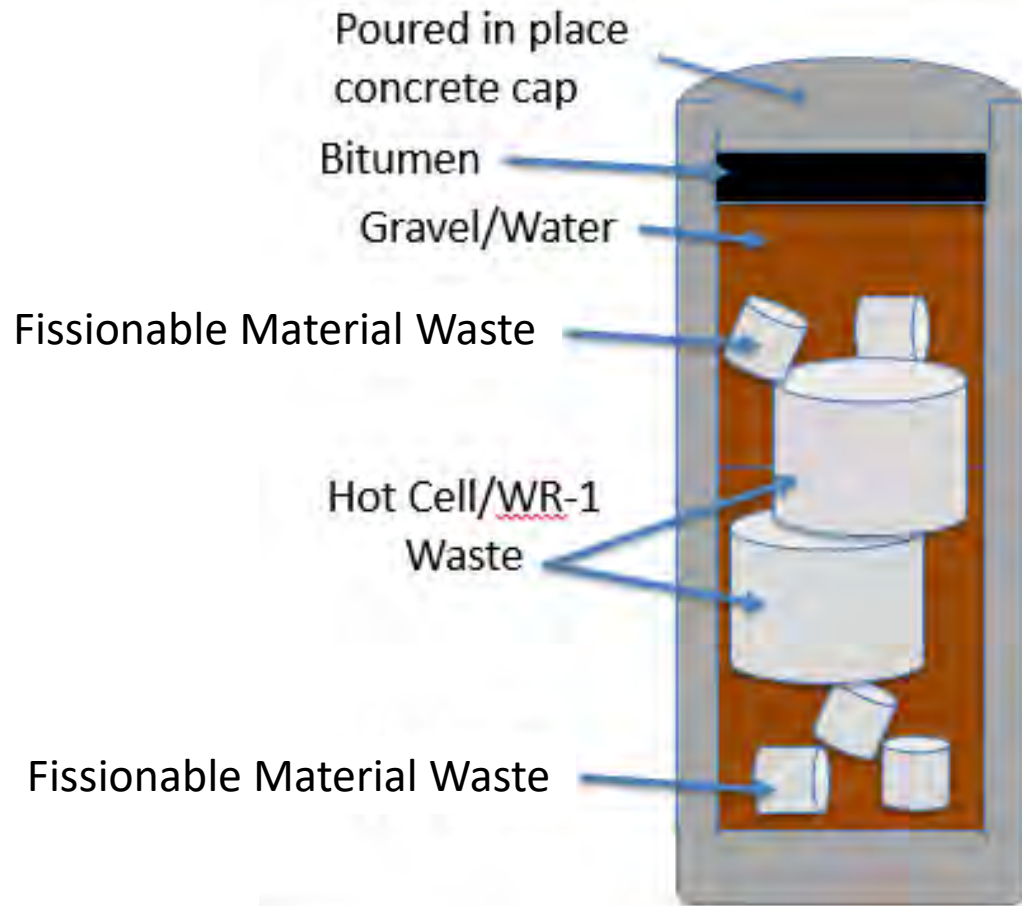
Decommissioning of the Waste Management Area

Trench Remediation



Decommissioning of the Waste Management Area

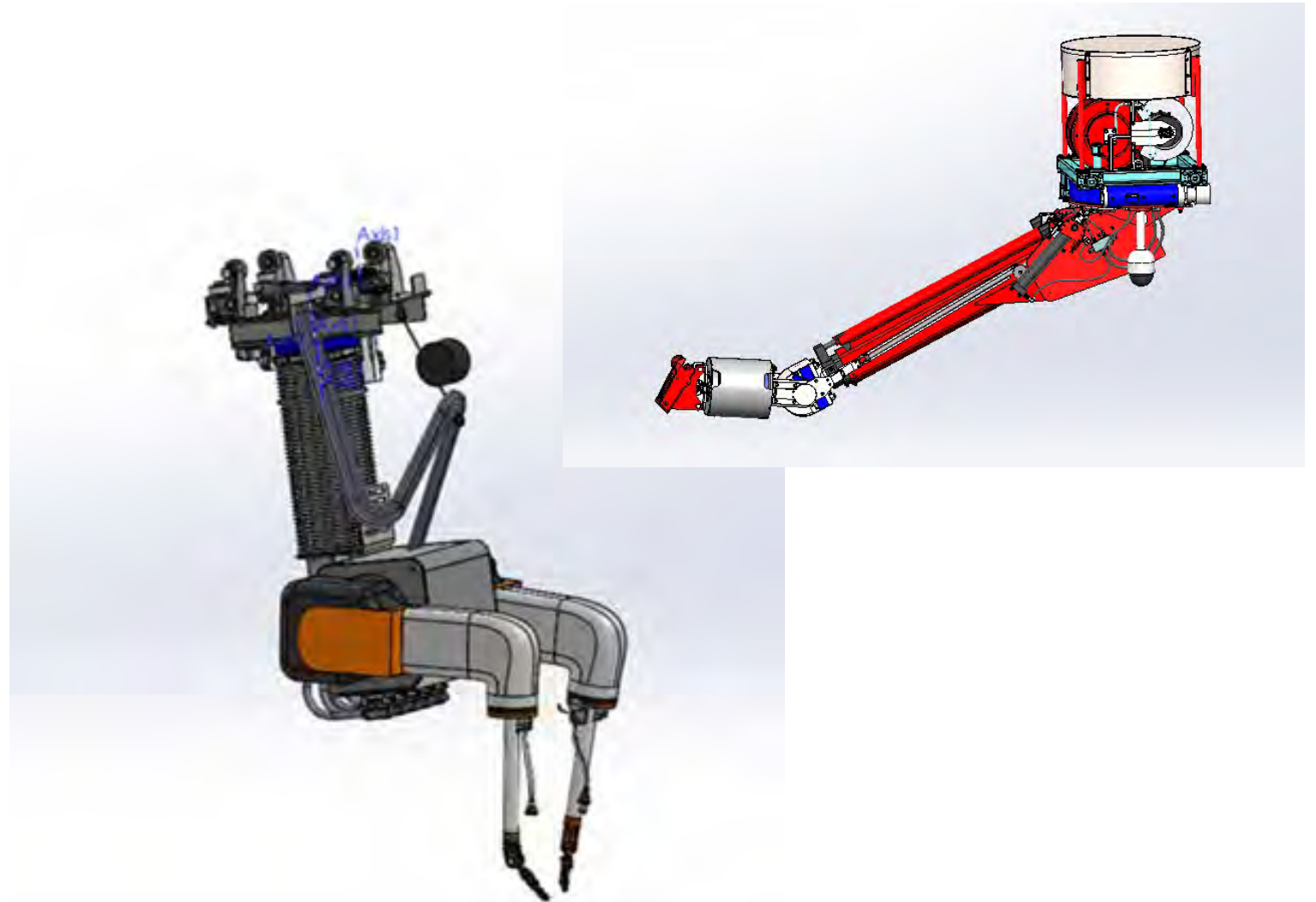
Standpipes and Intermediate-Level Waste (ILW) Bunker Remediation



ILW Waste Retrieval

Sorting & Repackaging

- Retrieve Standpipe and ILW Bunker Contents with Remote Equipment
- Transfer to Sorting, Characterization and Re-Packaging Unit
- Load Waste into Certified Transportation Containers

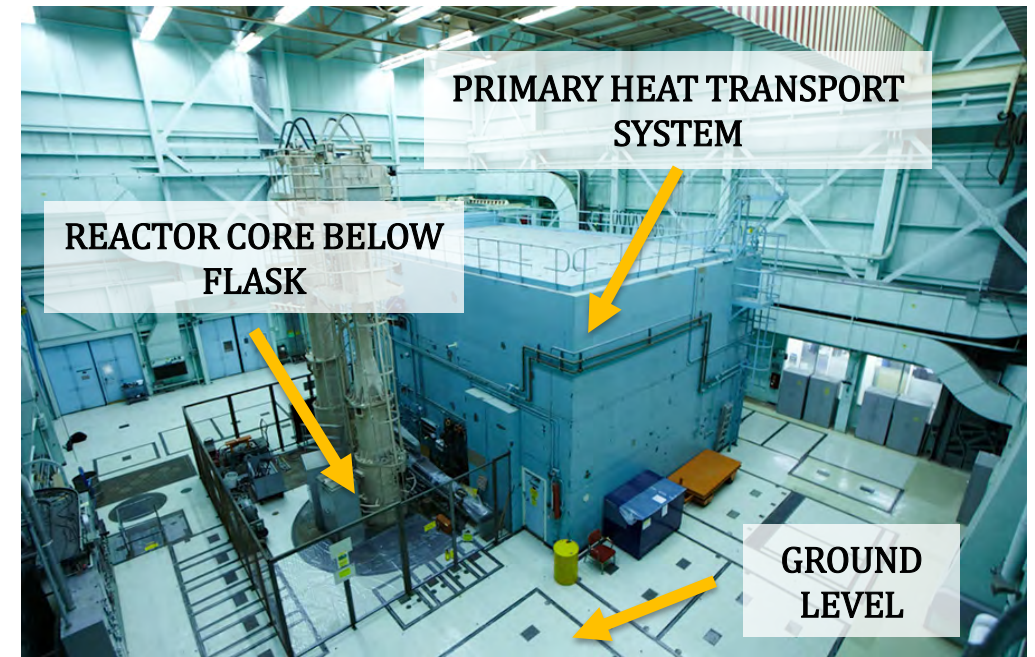


WR-1 Facility (Building 100)

WR-1 FACILITY - BUILDING 100



WR-1 REACTOR MAIN HALL





Waste Transportation

- 172 shipments of Low-Level Waste from WL to CRL completed to-date (2019 Jul), which included 780 packages (3,557 cubic meters of LLW)
- 3 shipments of ILW completed to-date
- 335,125 km travelled
- Zero incidents/accidents and zero non-conformances





Whiteshell Laboratories Safety & Performance



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Whiteshell Regulatory Performance (2009-2019)

Safety and Control Areas

- Management System
- Human Performance Management
- Radiation Protection
- Conventional Health & Safety
- Environmental Protection
- Security

Other Matters of Regulatory Interest

- Engagement with Indigenous Communities
- Public Information Program



Management System

CNL Performance (2009-2019)

- Management System ensures safe, effective and efficient conduct of work
- Up-to-date, compliant and agile framework
- Captures requirements of GoCo management model
- Applies to all activities across CNL
- CNL Management System aligns with CSA N286-12; WL Decommissioning QA Plan aligns with CSA N286.6-98 and N286-12
- Employee surveys support staff engagement and CNL's safety culture





Human Performance Management

- Builds on strong safety culture, promotes safe practices and encourages learning
- Resulted in performance improvements, e.g., via training, communication and observation
- Resulted in the reduction of the number of unplanned events





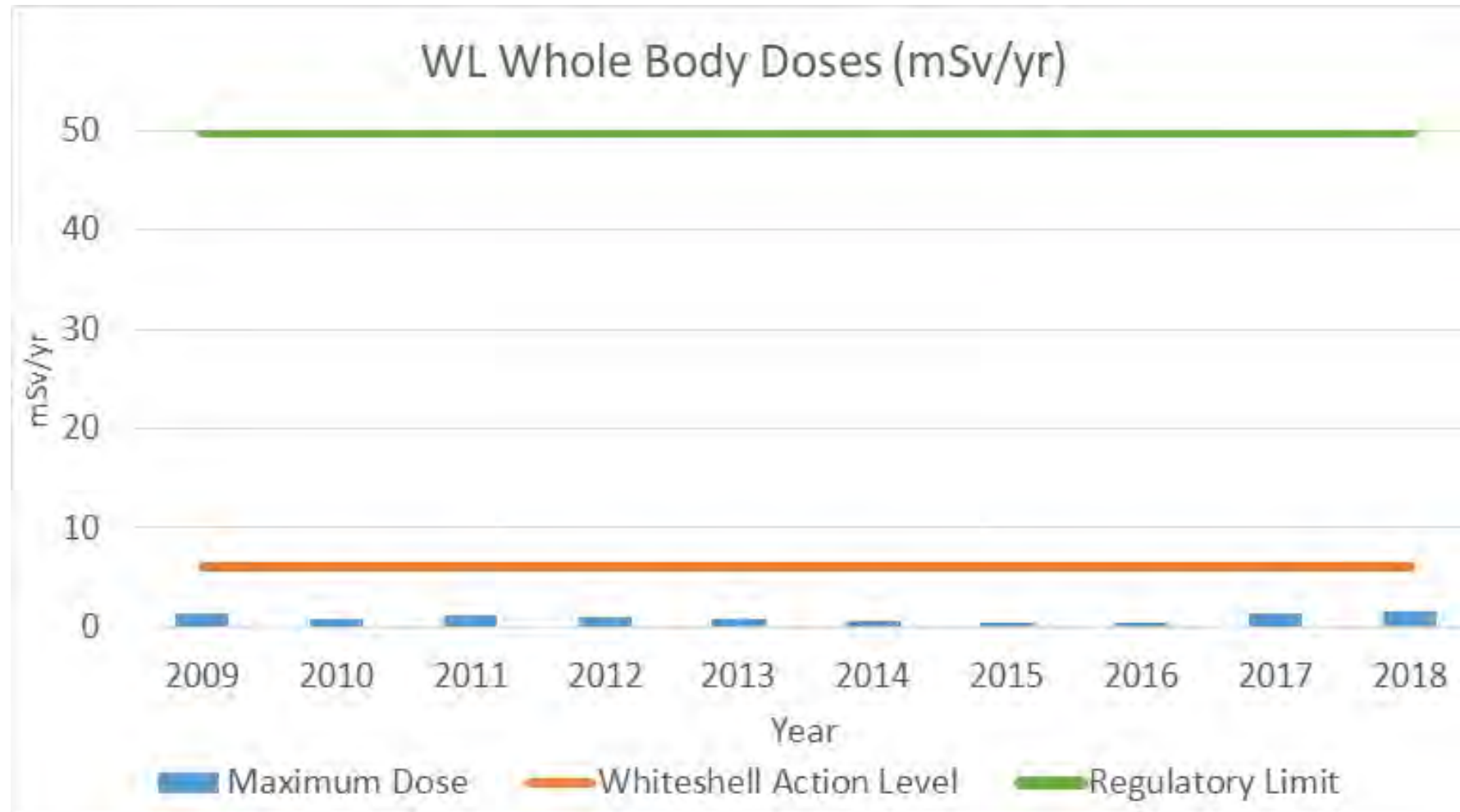
Radiation Protection

- Re-designation (size reduction) of radiological areas
- Use of enhanced Personal Protective Equipment & Clothing
- Optimized types and usage of immobilizing agents and cutting methods



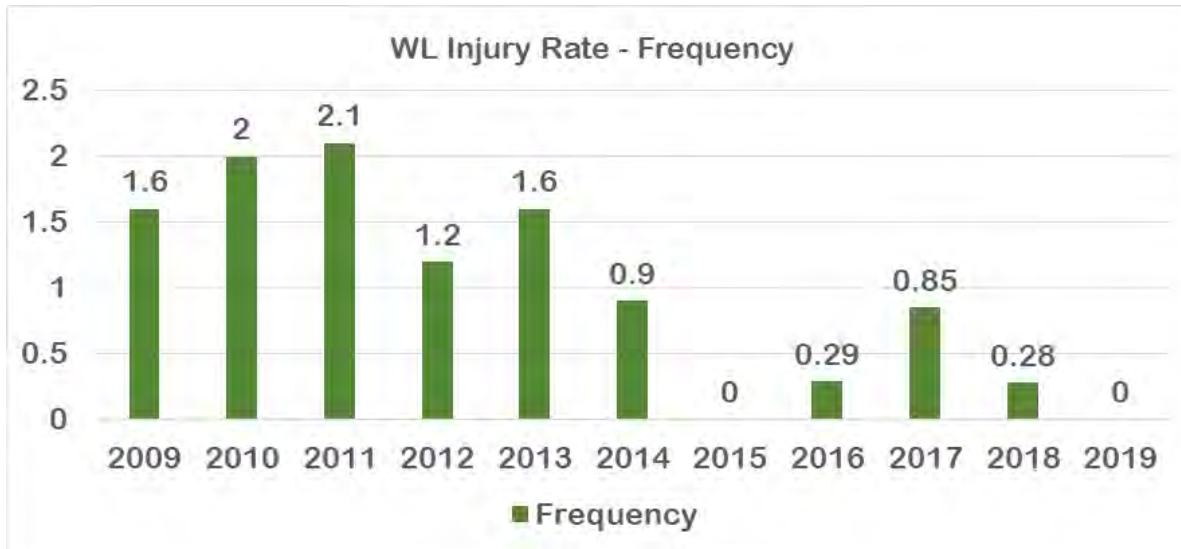
Summary of Whole Body Radiation Doses

Whiteshell Laboratories

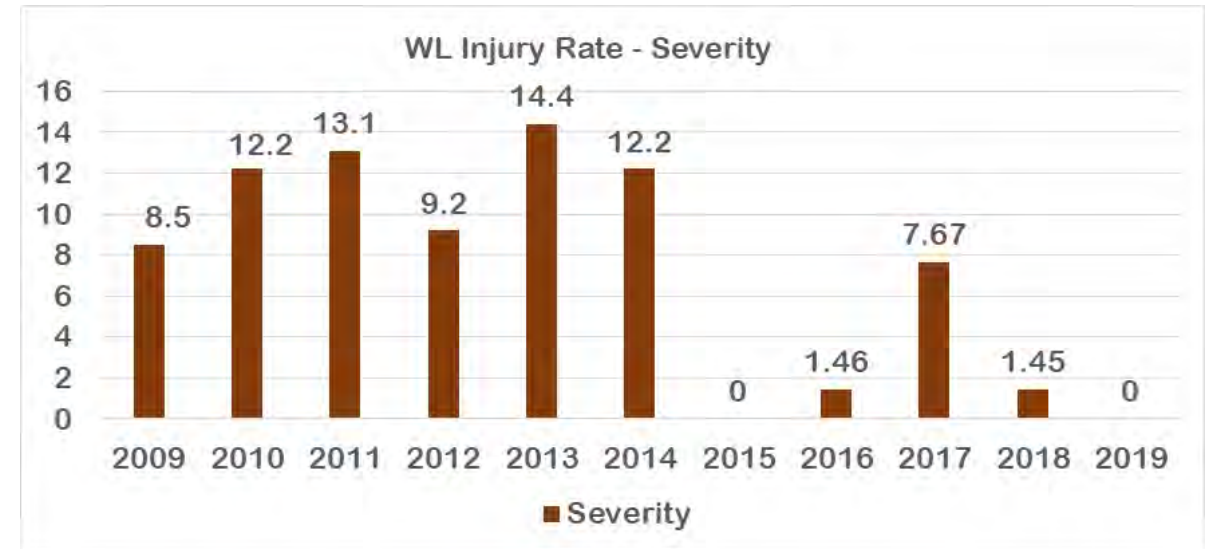


Conventional Health & Safety

Improvements in WL Injury Rate



$$\text{Frequency Rate} = \frac{(\text{No. of Injuries} \times 200,000)}{\text{No. Person} - \text{Hours Worked}}$$

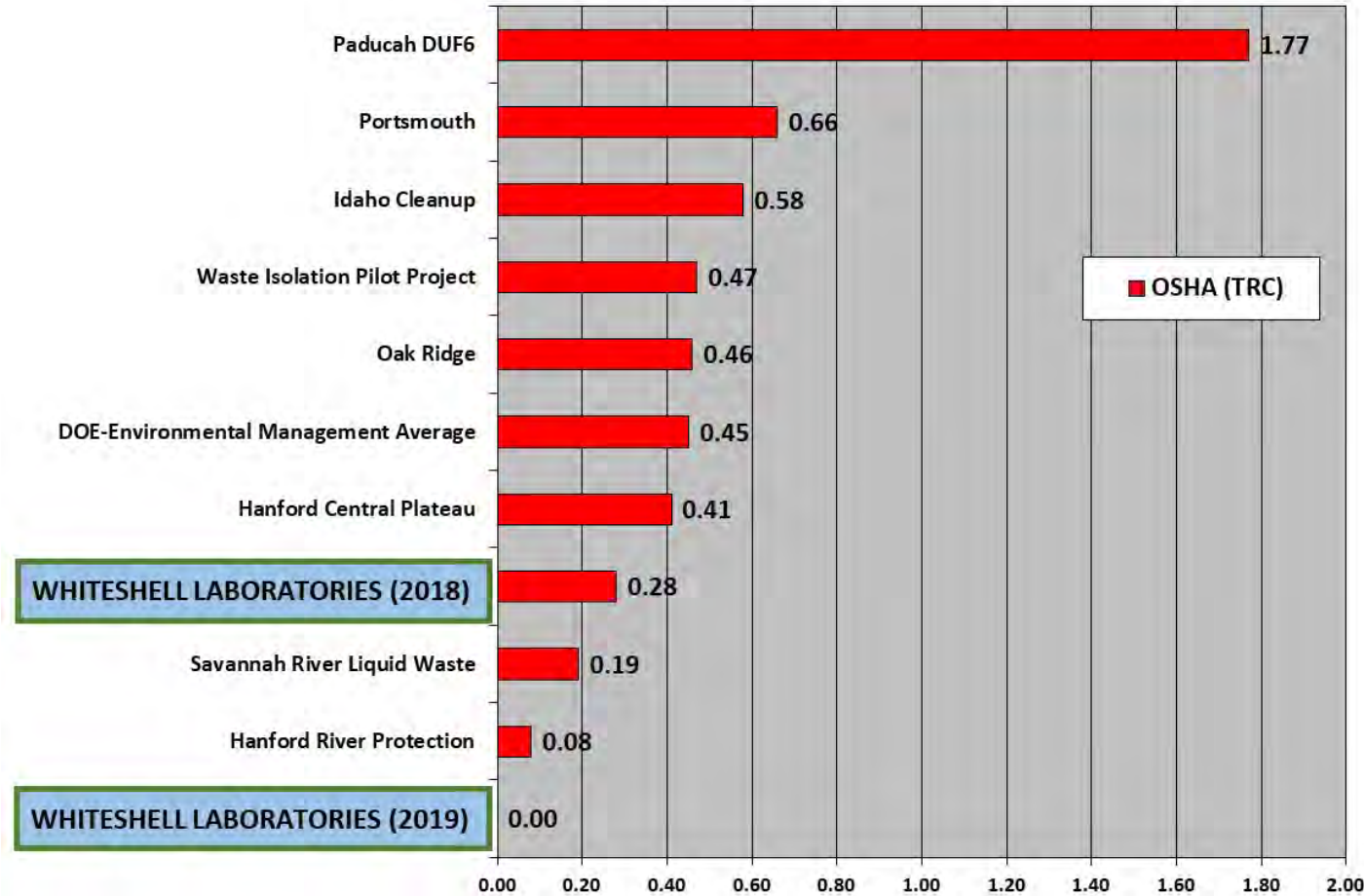


$$\text{Severity Rate} = \frac{(\text{No. of Working Days Lost} \times 200,000)}{\text{No. Person} - \text{Hours Worked}}$$



Whiteshell Injury Rate Data Comparison

WL Comparison with US Department of Energy (DOE) - 2019 January to June



OSHA = USA Occupational Safety & Health Administration

TRC = Total Recordable Cases (equivalent to CNL's definition of frequency)

US DOE Data for CY 2019 through June. From US DOE "Injury and Illness Dashboard"

Environmental Protection

Commitment to environmental sustainability

CNL's Environmental Policy ensures that protection of the environment and sustainability are integral components of CNL's decision-making in all of its business activities.



Environmental Monitoring at Whiteshell

Environmental Protection Program

- Effluent monitoring (air and water)
- Environmental monitoring
- Groundwater monitoring

Collect routine environmental samples from:

- Winnipeg River water (17 km upstream of WL to 28 km downstream)
- River sediments, soil, fish, natural vegetation, garden crops, wild game



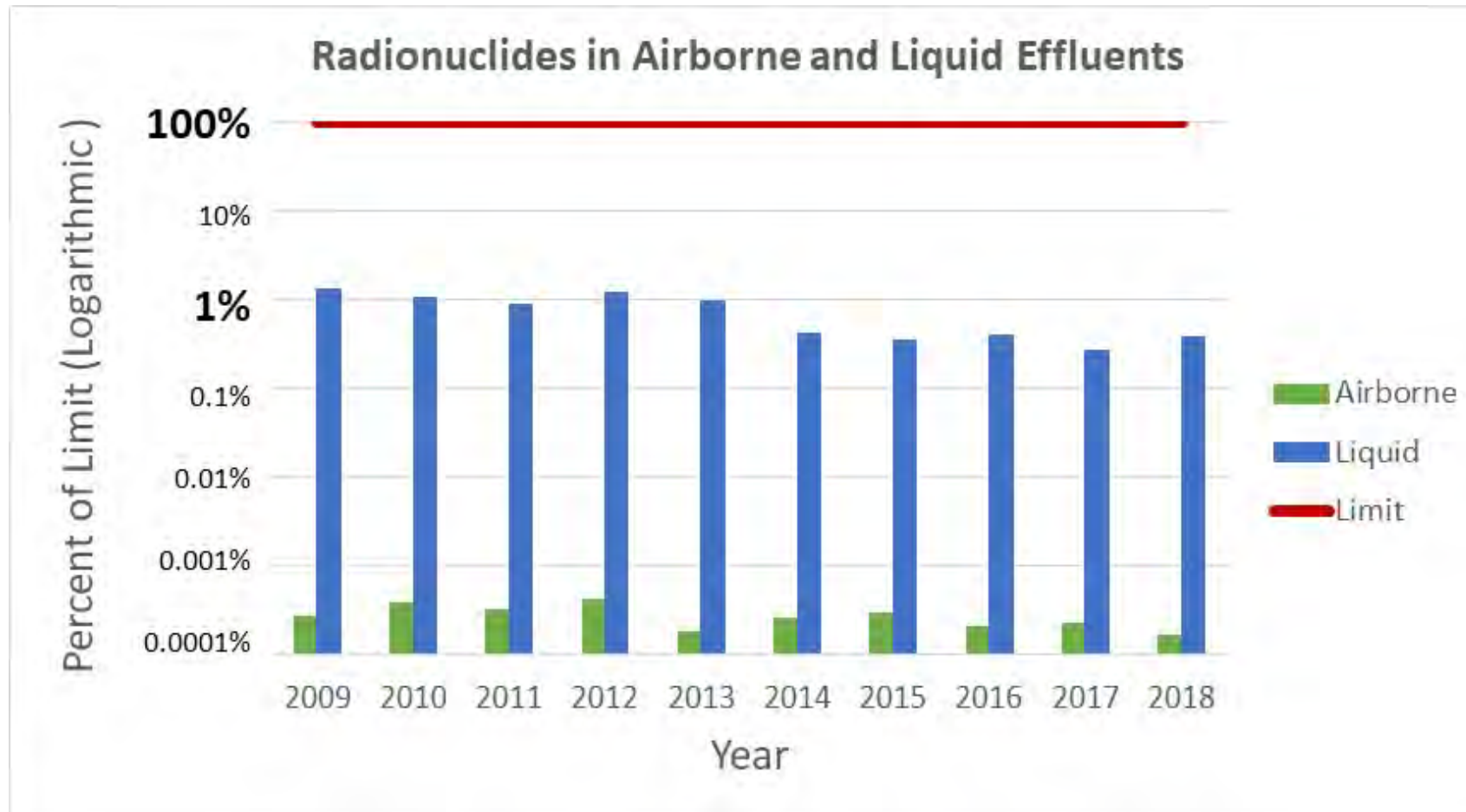
On-site Groundwater Monitoring Program

- Sampling wells located around each WL facility (e.g., Waste Management Area, lagoon, landfill)
- Both radiological and non-radiological monitoring
- More than 200 sampling locations
- Majority of samples are collected by the environmental field crew
- Over 10,000 analyses per year are performed either on-site or through contract laboratories
- Over 50 years of environmental data



Summary of Effluent Releases

Whiteshell Laboratories



Recent Security Improvements at Whiteshell

- Upgrade to Main Gate provides a more robust deterrent and vehicle denial capability
- Relocation of Security desk with 24 hour posting
- Site radio system digital upgrade
- Security operating system upgrade
- Installation of Site card access system
- Installed new intrusion detection on entry portals
- Protected Area expansion
 - Enhanced fences and barriers, detection, lighting
- Increased participation of RCMP off-site responders

In summary, since 2018, CNL has implemented significant security changes that improve WL capabilities to deter, detect, delay and respond to security threats





Engagement with Indigenous Communities

- Ongoing engagement with 5 First Nation communities
 - Sagkeeng First Nation, Hollow Water First Nation, Black River First Nation, Brokenhead Ojibway Nation, Wabaseemoong Independent Nations
- Ongoing engagement with Manitoba Metis Federation





Engagement with Indigenous Communities

- Site tours, meetings, workshops, cultural events and project community visits / open houses, events, newsletters
- Involvement with environmental monitoring
- Benchmarking trip
- Industry Day held at nearest First Nation community
- Funding, formalized participation and contribution agreements signed





Public Information Program

- Site tours and engagement with government, public and media
- Community events, social media
- Public Liaison Committee
- Regional public information sessions
- Regional economic regeneration funding
- CNL/AECL alumni technical workshop
- Annual newsletter mailed across region



Whiteshell Public Open House

2019 June 8



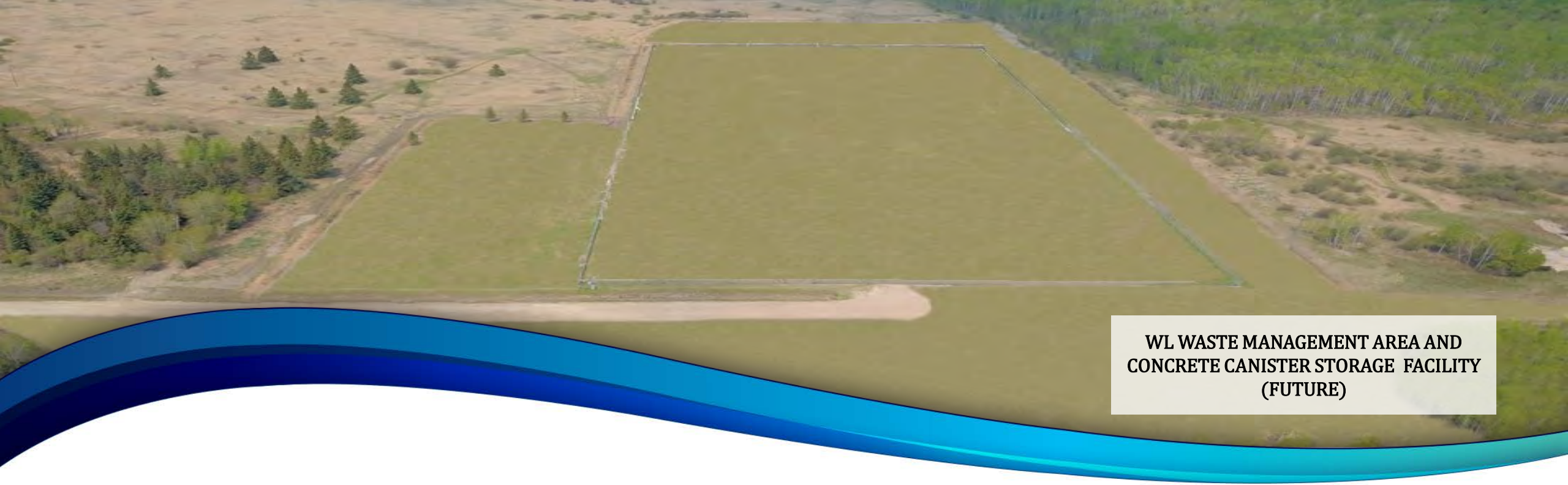
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**WL WASTE MANAGEMENT AREA AND
CONCRETE CANISTER STORAGE FACILITY
(FUTURE)**

Where will we be at the end of the licensing period?

- End State
- Transition to institutional control





WL MAIN CAMPUS
(FUTURE)

Thank You. Questions?



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