DEEP GEOLOGIC
REPOSITORY
FOR OPG's LOW & INTERMEDIATE LEVEL WASTE

OPG's Deep Geologic Repository Project Communications and Consultation Report: Community Open Houses November 2009

December 2009

Prepared by:
AECOM

NWMO DGR REP-07723-0001

AECOM

Note:
The Nuclear Waste Management Organization (NWMO) is managing the development of a Deep Geologic Repository for low and intermediate level radioactive waste, at the Bruce nuclear site, on behalf of Ontario Power Generation (OPG).

Nuclear Waste Management Organization
22 St. Clair Avenue East, Toronto, Ontario M4T 2S3 Canada
Toll Free: 1.866.249.6966
www.nwmo.ca

DEEP GEOLOGIC

REPOSITORY

FOR OPG's LOW & INTERMEDIATE LEVEL WASTE

OPG's Deep Geologic Repository Project Communications and Consultation Report: Community Open Houses November 2009

December 2009

Prepared by:
AECOM

Recommended by: _____ 18 MAR 10
D. Baker Date
Environmental Assessment Manager
OPG

Accepted by: _____ Mar 19/10
A. Costello Date
Vice President, Environmental Assessment & Compliance Support
OPG

DOCUMENT HISTORY

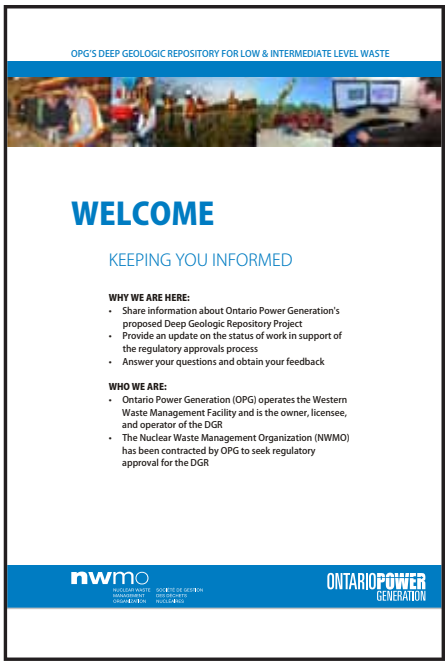
Title:	OPG's Deep Geologic Repository Project Communications and Consultation Report: Community Open Houses November 2009		
Report Number:	NWMO DGR-REP-07723-00001		
Revision:	0	**Date: March 17, 2010**	December 2009
Notes:	Initial Release		
Prepared by:	L. Taylor Consultation and Communications Specialist		
Reviewed by:	Don Richardson Senior Consultant, Consultation and Communications		
Approved by:	Don Richardson 		

Table of Contents

Appendices

1. Introduction

This report documents a series of seven Community Open Houses hosted by the Nuclear Waste Management Organization (NWMO) on behalf of Ontario Power Generation (OPG) in November 2009. The report was prepared by AECOM and contains materials prepared by NWMO and AECOM, and local newspaper reports.


OPG'S DEEP GEOLOGIC REPOSITORY FOR LOW & INTERMEDIATE LEVEL WASTE

WELCOME

KEEPING YOU INFORMED

WHY WE ARE HERE:

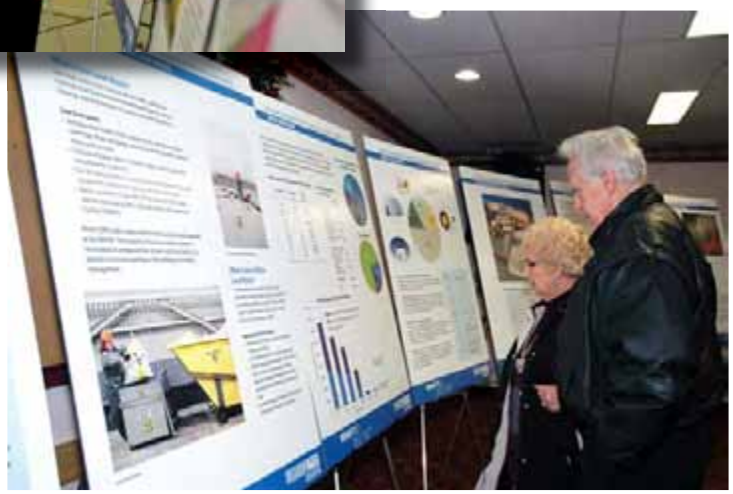
- Share information about Ontario Power Generation's proposed Deep Geologic Repository Project
- Provide an update on the status of work in support of the regulatory approvals process
- Answer your questions and obtain your feedback

WHO WE ARE:

- Ontario Power Generation (OPG) operates the Western Waste Management Facility and is the owner, licensee, and operator of the DGR
- The Nuclear Waste Management Organization (NWMO) has been contracted by OPG to seek regulatory approval for the DGR

nwmo

ONTARIO POWER GENERATION

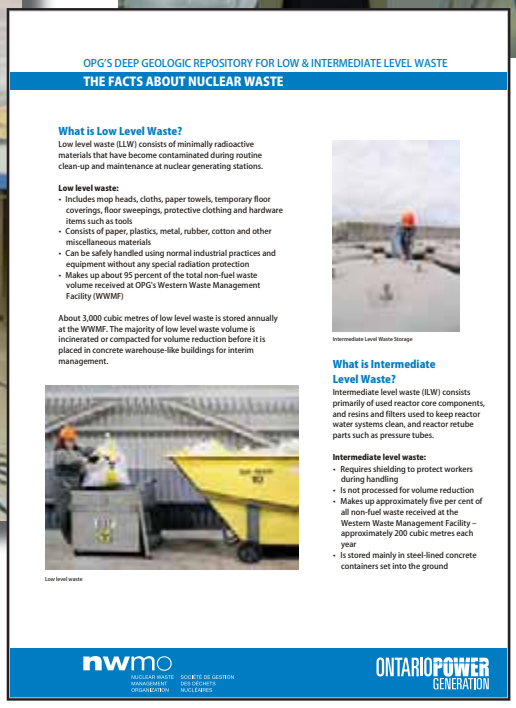


2. Community Open House Topics

This is the third round of Community Open Houses held to provide interested community members with an opportunity to learn about and provide input on the following topics:

- the proposed OPG Deep Geologic Repository (DGR) Project for Low and Intermediate Level Waste, and changes and updates since previous Open Houses;
- the Environmental Assessment undertaken as an integral part of the planning and approval process;
- the results of geoscientific characterization work done to date;
- the results of the safety assessment work done to date;
- the updated conceptual design of the DGR; and
- the science and technology behind safe storage of low and intermediate waste.

The Open Houses also offered a venue for community members to provide comments on the open house format and the proposed project.



OPG'S DEEP GEOLOGIC REPOSITORY FOR LOW & INTERMEDIATE LEVEL WASTE

THE FACTS ABOUT NUCLEAR WASTE

What is Low Level Waste?

Low level waste (LLW) consists of minimally radioactive materials that have become contaminated during routine clean-up and maintenance at nuclear generating stations.

Low level waste:

- Includes mop heads, cloths, paper towels, temporary floor coverings, floor sweepings, protective clothing and hardware items such as tools
- Consists of paper, plastics, metal, rubber, cotton and other miscellaneous materials
- Can be safely handled using normal industrial practices and equipment without any special radiation protection
- Makes up about 95 percent of the total non-fuel waste volume received at OPG's Western Waste Management Facility (WWMF)

About 3,000 cubic metres of low level waste is stored annually at the WWMF. The majority of low level waste volume is incinerated or compacted for volume reduction before it is placed in concrete warehouse-like buildings for interim management.

Low level waste

Intermediate Level Waste Storage

What is Intermediate Level Waste?

Intermediate level waste (ILW) consists primarily of used reactor core components, and resins and filters used to keep reactor water systems clean, and reactor retube parts such as pressure tubes.

Intermediate level waste:

- Requires shielding to protect workers during handling
- Is not processed for volume reduction
- Makes up approximately five per cent of all non-fuel waste received at the Western Waste Management Facility – approximately 200 cubic metres each year
- Is stored mainly in steel-lined concrete containers set into the ground

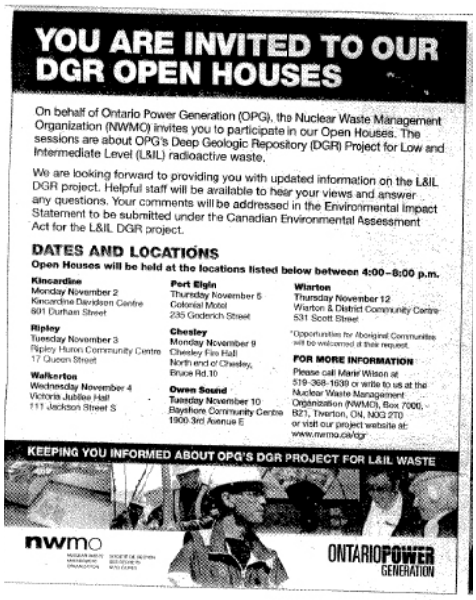
nwmo NUCLEAR WASTE MANAGEMENT ORGANIZATION / SOCIÉTÉ DE GESTION DES DÉCHETS NUCLÉAIRES

ONTARIO POWER GENERATION

3. Notification

Notification to community members was provided by the following:

- A postcard format letter of invitation was delivered by Canada Post's Unaddressed Admail to more than 50,000 households in the communities where the Open Houses were held, in Kincardine, Ripley, Walkerton, Port Elgin, Owen Sound, Chesley and Wiarton, and in the surrounding communities (see Appendix A for a list of community distribution).
- A newspaper announcement was published as an advertisement in the Kincardine News, Kincardine Independent, Lucknow Sentinel, Walkerton Herald Times, Owen Sound Sun Times, Port Elgin Shoreline Beacon, and the Wiarton Echo, prior to the open houses (Appendix A).
- Letters were sent to those on the Stakeholder list, including local elected officials, City and County municipal staff leaders (including police, fire and emergency services), local and regional non-governmental organizations with a potential interest, and local and regional media outlets. Invitations were sent to a number of organizations in the United States as well (see Appendix A for the mailing list).
- Radio spots were purchased for six local radio stations that serve the open house communities. Seven different announcements, specific to each open house, were prepared and aired prior to and on the day of each Open House (Appendix A).
- An advertisement was placed in the October 2008 edition of Marketplace, a local advertising publication (Appendix A).
- The dates, times and locations of the Open Houses were posted on the DGR page of the NWMO website (www.nwmo.ca/dgr) prior to and during the Open Houses.
- The October 2009 DGR Newsletter, was distributed by Canada Post drop to nearly 25,000 included the dates, times and locations of the Open Houses.



4. Dates and Venues

The Community Open Houses were held at the following locations:

Kincardine – Monday November 2
Davidson Centre
601 Durham Street
Kincardine, ON

Ripley – Tuesday November 3
Ripley Huron Community Centre
17 Queen Street
Ripley, ON

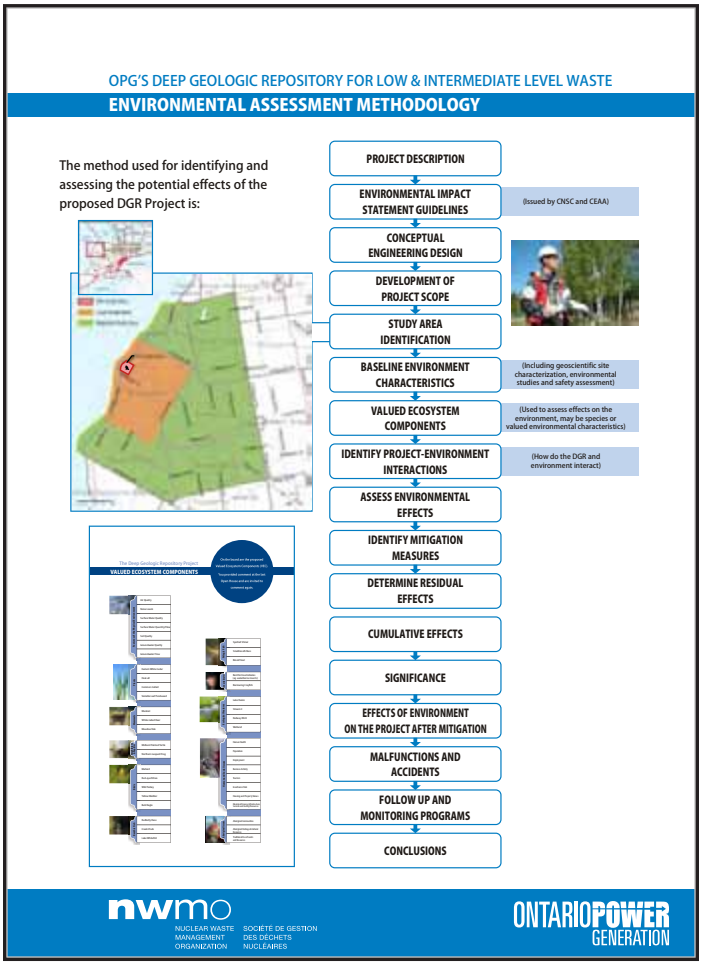
Walkerton – Wednesday November 4
Victoria Jubilee Hall
111 Jackson Street South
Walkerton, ON

Port Elgin – Thursday November 5
Colonial Motel
235 Goderich Street
Port Elgin, ON

Chesley – Monday November 9
Chesley Fire Hall
Bruce Road 10
Chesley, ON

Owen Sound – Tuesday November 10
Bayshore Community Centre
190 3rd Avenue East
Owen Sound, ON

Wiarton – Thursday November 12
Wiarton & District Community Centre
Wiarton, ON



5. Number of Participants

A total of 89 persons registered their names as attendees of the Community Open Houses:

Kincardine - 18
Ripley - 5
Walkerton - 10
Port Elgin - 18
Owen Sound - 22
Chesley - 5
Wiarton - 11

It is estimated that more than 90% of attendees signed in. Sign-in lists are provided in Appendix E.

6. Community Open House Format

The Community Open Houses provided an informal opportunity for community members to learn about the proposed project, to have their questions answered and to provide feedback on the project. Participants viewed display materials, had discussions with NWMO and OPG representatives and enjoyed light refreshments.

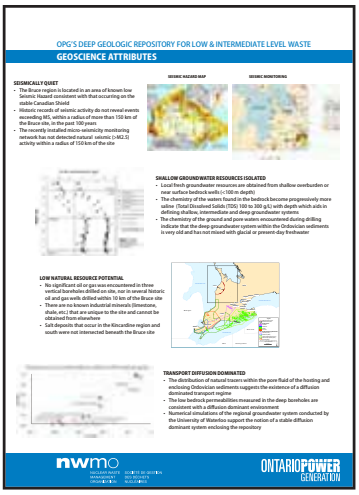
Each Open House ran from 4 pm to 8 pm. Copies of recent NWMO project newsletters, copies of the 2008 DGR Annual Report, brochures describing the DGR Project for Low and Intermediate Level Waste as well as copies of the Open House display panels were available for participants to take away (Appendix C).

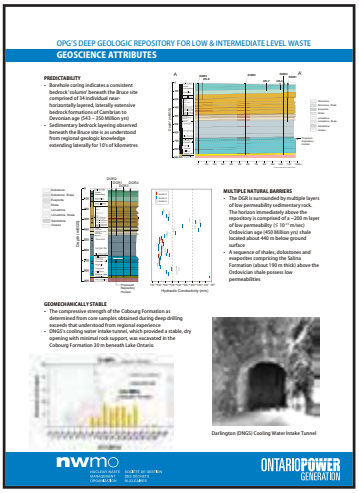
Participants were encouraged to fill out comment cards.

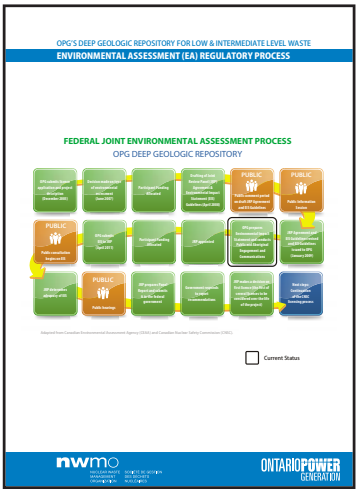
Display Panels

Twenty-one 30” x 40” display panels provided the following information:

1. “Welcome” – showing employees at work on the project
2. “The Facts About Nuclear Waste” – illustrating and explaining low level and intermediate level nuclear waste
3. “What is Radiation?” – a description of sources of radiation in the environment, and radiation exposure regulations
4. “Waste Inventory” - a breakdown of the different waste materials to be emplaced in the DGR
5. “An Overview of the Proposed Deep Geologic Repository” – illustrating key features of the proposed construction and operation of the DGR
6. “DGR Engineering Design Concept” - illustration of the 2009 design
7. “Geoscientific Investigation at the Bruce Site” – photo collage illustrating aspects of the Geoscientific Site Characterization Program
8. “Geoscience Attributes” - presenting the predictability of bedrock, the multiple natural barriers and the geomechanical stability of the rock
9. “Geoscience Attributes II” - presenting the seismically quiet nature of the region, the isolation of shallow groundwater resources, the lack of natural resource potential and the diffusion dominated transport of deep groundwater
10. “Borehole Locations” - indicating the location and stratigraphy of boreholes
11. “An International Perspective” – an overview of international experiences in the long-term management of nuclear waste
12. “The Safety Case for the DGR” – a description of natural barriers to protect the public, and groundwater
13. “The Role of Safety Assessment”– provides an outline of the role safety assessments and explains the iterative process involved.

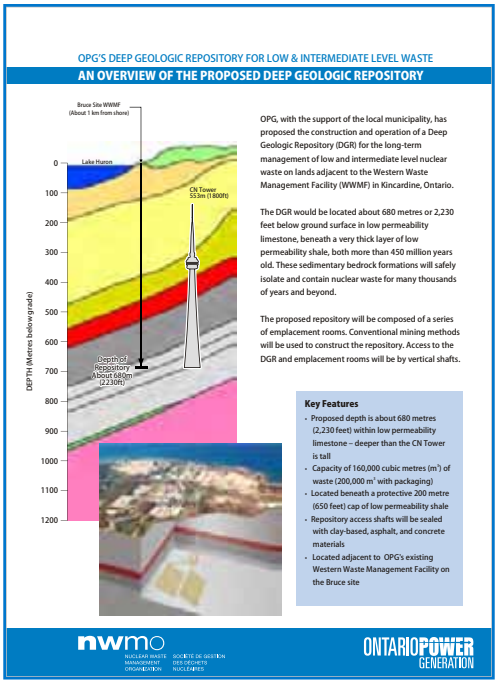


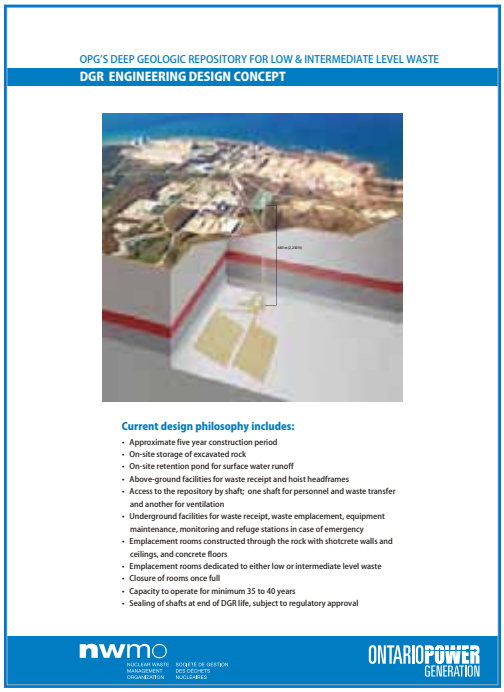




14. “Operational (Preclosure) Safety Assessment”– provides an outline of the role safety assessments for normal operation and accidents, as well as the potential effects on humans and biota during PreClosure.
15. “Long-Term (Postclosure) Safety Assessment - Approach” – outlines the method used and scenarios assessed the interim safety assessment
16. “Long-Term (Postclosure) Safety Assessment - Results” – presents the interim safety assessment conclusions
17. “Environmental Assessment Regulatory Process” – describing and illustrating the decision and approval process
18. “Environmental Assessment Methodology” – flowchart outlining the components of the EA investigations
19. “Our Answers to Some of Your Previous Questions” – a panel listing public comments and OPG responses
20. “Major Project Works and Activities” – explains the site preparation and construction phases
21. “Major Project Works and Activities” – explains the operations phase

See Appendix D for images of each of the display panels.





7. Opportunities for Input

Comment Cards

Comment cards in the style of large sized postcards provided the opportunity for participants to rate their experience at the Open House, and to write comments. Cards could be filled out at the Open House, or mailed in afterwards.

In total, 24 comment cards were returned. Of those, seven included written comments, and all responded to the questions evaluating the Open House. All comment card feedback is provided in Appendix E.

Comments/Questions?
Let us know.

PLACE STAMP HERE

Nuclear Waste Management Organization
Media Relations Manager
P.O. Box 7000, B21
Tiverton, Ontario
N0G 2T0

Name:
Address:
Phone:
Email:

email: dgrinfo@nwmo.ca mwilson@nwmo.ca Phone: 519-368-1639

Please leave this card with our open house staff, or mail it back to us at your convenience. You can also email us with your comments at dgrinfo@nwmo.ca or visit our website for more information at www.opg.com/dgr.

Open House Evaluation
Please rank the following statements on a scale of 1 to 5 where "1" is "strongly disagree","3" is neutral or "no opinion" and "5" is "strongly agree".

a. The open house panels helped me to understand the deep geological repository (DGR) proposal.
1 2 3 4 5

b. The open house location and hours were convenient for me.
1 2 3 4 5

c. The open house staff were helpful.
1 2 3 4 5

d. Overall, the open house helped me to satisfy the information needs I had.
1 2 3 4 5

e. I will recommend to my friends and family members that they should come to a future DGR open house.
1 2 3 4 5

email: dgrinfo@nwmo.ca mwilson@nwmo.ca
Phone: 519-368-1639

nwmo NUCLEAR WASTE MANAGEMENT ORGANIZATION SOCIÉTÉ DE GESTION DES DÉCHETS NUCLÉAIRES

ONTARIO POWER GENERATION

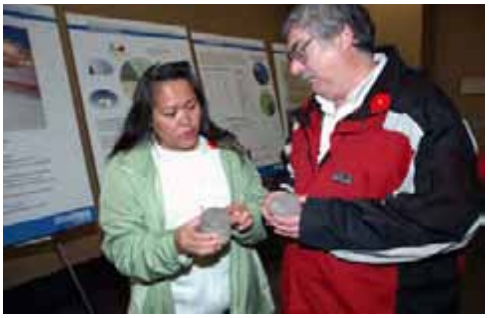
8. Key Areas of Discussion

Many Open House attendees were already familiar with the proposed DGR Project, having participated in other stakeholder communications events. The majority of those who attended the Open Houses expressed support for the project. One of the primary reasons for attending the Open Houses was to obtain an update on the progress of the project and the studies associated with it. Visitors tended to stay for between 20 and 60 minutes on average. Comments received from prior Open Houses were also presented on a display panel with NWMO/OPG responses (presented in Appendix D).

The discussions at the 2009 Open Houses covered a broad range of subjects. The questions most frequently asked included the following key issues:

How can it be assured that no contaminants will escape to surface waters?

NWMO/OPG response: The proposed DGR is about 1 km from the lake and more than 400 m below the depth of the lowest point of Lake Huron near the site. The DGR Project will store waste currently managed safely at surface underground at a depth of 680 m . The DGR is proposed in a layer of very low permeability limestone and is overlain by a 200 m thick layer of low permeability shale which isolates the repository from surface water resources.



What is the difference between the different types of radioactive waste?

NWMO/OPG response: Low level waste has low levels of radioactivity and includes protective clothing, floor sweepings, mops, rags, etc. It can be handled without special radiation protection. Intermediate level waste includes used reactor core components, and resins and filters. It cannot be handled without radiation protection.

What assurance is there that "the door isn't open" for high level waste disposal, or that waste will not be imported from other nuclear companies in Canada or other countries?

NWMO/OPG response: The Hosting Agreement between the Municipality of Kincardine and OPG is for the management of waste from OPG-owned reactors. OPG's Environmental Impact Statement and application for licence are for low and intermediate level waste only from OPG-owned reactors.

Can the waste be recycled/reused?

NWMO/OPG response: Although there have been recent statements in the media about waste recycling opportunities for nuclear waste, the majority of the low and intermediate level waste proposed to be placed in the DGR has no further value.

How will the doses underground compare with those at the surface?

NWMO/OPG response: The doses to workers underground from low level waste will be comparable to those currently experienced in the above-ground storage buildings. Similarly, doses to workers handling the intermediate level waste will be about the same as to those handling the waste above ground. OPG will have monitoring programs in place to assure that workers are not exposed to unacceptable doses.

How many generations of nuclear waste will the DGR accept?

NWMO/OPG response: The DGR has been sized to accept all the L&ILW from Pickering, Darlington and the Bruce generating stations for their lifetimes, and allows for each generating station to be refurbished once.

Are there potential health risks associated with nuclear sites in general, including possible links to increased levels of leukemia?

NWMO/OPG response: OPG is not aware of any increased incidence of cancers in the proximity of the site. Durham Region, in Radiation and Health in Durham Region 2007, assessed possible health effects from the Pickering and Darlington NGSs. It concludes that disease rates in Ajax-Pickering and Clarington did not indicate a pattern to suggest that the Pickering NGSs and Darlington NGS were causing health effects in the population.

When would the DGR be operating?

NWMO/OPG response: According to the current schedule, construction could start in 2012/2013 and the DGR could be operating in 2017/2018.

What passive controls would be in place to mark the location of the DGR for future generations?

NWMO/OPG response: At this time there are no specific plans. Control mechanisms aren't required for another 50-100 years. At that time, it's expected several countries will be in the same position, and it's anticipated a solution will be developed with international consensus.

What is the cost of the project and where will the money come from?

NWMO/OPG response: The cost of the DGR is currently estimated to be about $1 billion. This includes $600 million for construction and $400 million for operation. A more detailed cost estimate is not yet available. An existing segregated fund, which has been accumulating funds as part of electricity rates and is fully funded, will be used to pay the cost of the DGR Project.

What routes are used to transport the waste to the WWMF?

NWMO/OPG response: Paved provincial and municipal roads suitable for commercial vehicles carrying heavy loads are used to transport the waste unless emergent conditions dictate a need for change.

9. Media Coverage of the Open Houses

Journalists interviewed NWMO and OPG representatives and Open House attendees during the open houses.

Following the community open houses, the following articles, editorials and letters-to-the-editor appeared in local newspapers and radio stations (see Appendix B):

- Bayshore Broadcasting Centre (Owen Sound) - Monday, November 2, 2009: “New Open Houses for DGR,” by reporter James Morgan
- Bayshore Broadcasting Centre (Kincardine) - Tuesday, November 3, 2009: “Little interest in DGR meeting,” by reporter James Morgan
- Radio CKNX AM (Wingham) – Tuesday, November 3rd, 2009: “More Talk About Nuclear Waste Storage”
- Saugeen Times - Wednesday, November 4th, 2009: “New emplacement design unveiled at DGR open house,” by Liz Dadson
- Kincardine News - Tuesday, November 10th, 2009: “DGR project making headway,” by Elyse Dewar
- Walkerton Herald Times (Walkerton) – Wednesday, November 11, 2009: “Keeping the public informed,” photo by John McPhee
- Kincardine Independent - Wednesday, November 11th, 2009: “People knowledgeable about DGR, says official,” by Eric Howard

10. Appendices

Appendix A: Notification Materials

- Letter of Invitation (addressed mail)
- Mailing List for Invitation Letters
- Postcard Invitation (unaddressed admail)
- Distribution Breakdown for postcard Invitation
- Newspaper announcements
- Placement of newspaper announcements
- Distribution of Radio Scripts
- Radio Scripts
- Marketplace announcement

Appendix B: Newspaper Coverage

Appendix C: Open House Handouts

- DGR 2008 Annual Report
- Information booklet: Keeping You Informed
- DGR newsletter, October 2009
- Western Waste Management Facility booklet

Appendix D: Open House Display Panels

Appendix E: Open House Sign-in Sheets and Comment Cards

Appendix A

Notification Materials

Angelo Castellan
Vice President
Environmental Assessment &
Corporate Support
Tel 647.259.3018
Email acastellan@nwmo.ca

DGR-07723-T10

October 14, 2009

Mr. Brent Adlam
Centre of Applied Renewable Energy
P.O. Box 29
Brussels ON N0G 1H0

Dear Mr. Adlam:

Subject: Community Consultation for OPG's Low and Intermediate Level Radioactive Waste (L & ILW) Deep Geologic Repository Project

Consistent with the requirements of the Canadian Environmental Assessment Act, Ontario Power Generation (OPG) is pursuing completion and acceptance of an Environmental Impact Statement (EIS) for the proposed Deep Geologic Repository (DGR) Project for Low and Intermediate Level Radioactive Waste at the Bruce nuclear site. The Nuclear Waste Management Organization (NWMO) has been contracted by OPG to undertake the regulatory approvals process for the DGR.

As a part of that environmental assessment process, NWMO and OPG are seeking opportunities to communicate with interested stakeholders on the proposed DGR Project. To further these communication efforts, open houses have been scheduled in communities in the vicinity of the proposed project at the Bruce nuclear site during the early part of November 2009. At these open houses, we look forward to providing additional information about the DGR, responding to questions, and hearing the views of stakeholders on the proposed project. This feedback will be considered in the environmental impact statement submitted to the Joint Review Panel (that will preside over the hearings for the EIS and the site preparation/ construction licence application).

Open Houses are being held at the locations listed below and will be open between the hours of 4 p.m. and 8 p.m. each evening.

Kincardine	**Ripley**
Monday November 2	Tuesday November 3
Kincardine Davidson Centre	Ripley Huron Community Centre
601 Durham Street	17 Queen Street
Kincardine, ON	Ripley, ON

Walkerton

Wednesday November 4

Victoria Jubilee Hall

111 Jackson Street S

Walkerton, ON

Port Elgin

Thursday November 5

Colonial Motel

235 Goderich Street

Port Elgin, ON

Chesley

Monday November 9

Chesley Fire Hall

North end of Chesley, Bruce Rd. 10

Owen Sound

Tuesday November 10

Bayshore Community Centre

1900 3rd Avenue E

Owen Sound, ON

Wiarton

Thursday November 12

Wiarton & District Community Centre

Wiarton, ON

We look forward to seeing you at one or more of the Open Houses. If you would like further information on the proposed DGR Project please refer to our web site at: www.nwmo.ca/dgr or call Marie Wilson at 519-368-1639.

Sincerely,

Angelo Castellan

SALUT.	FIRST NAME	LAST NAME	TITLE	COMPANY	ADDRESS	CITY	PROVINCE	POSTAL CODE
Mr.	Brent	Adlam		Centre of Applied Renewable Energy	P.O. Box 29	Brussels	ON	N0G 1H0
Mr.	Eric	Advokaat		Natural Resources Canada	55 Murray Street, 6th Floor	Ottawa	ON	K1N 5M3
Mr.	Chief Ralph	Akiwenzie			R.R.#5	Wiarton	ON	N0H 2T0
Ms.	Joan	Albright	Chief Administrative Officer	Municipality Of Arran–Elderslie	1925 Bruce Road #10	Chesley	ON	N0G 1L0
Ms.	Mary Anne	Alton	Director	Bluewater District School Board	351 First Ave. North	Chesley	ON	N0H 1L0
Ms.	Ruth	Armstrong			R.R. #1	Mar	ON	N0H 1X0
Mr.	Tim	Andersen	Vice President	Southampton Residents Association	P.O. Box 1081	Southamption	ON	N0H 2L0
Mr.	Mike	Andrews	General Manager	Bruce Telecom	Box 80, 3145 Hwy 21 North	Tiverton	ON	N0G 2T0
Ms.	June	Anderson			R.R. #2	Annan	ON	N0H 1B0
Mr.	Thorsten	Arnold		Drinking Water Source Protection (DWSP)	RR3, Concession 3	Allenford	ON	N0H1A0
Mr.	Rick	Aubin		Port Elgin & District Lions Club		Port Elgin	ON	N0G 2CO
Mr.	John	Avis		Intera Engineering Ltd.	1 Raymond Street, Suite 200	Ottawa	ON	K1R 1A2
Mr.	Charlie	Bagnato	Mayor	Municipality Of Brockton	100 Scott Street	Walkerton	ON	N0G 2V0
Ms.	Lesley	Banks			146350 Side Road 15	Owen Sound	ON	
Mr.	Gary	Brown	President	Saugeen Shores Chamber of Commerce	515 Goderich St, Unit 113	Port Elgin	ON	N0H 2C4
Mr.	Robert	Barker	Project Officer	CNSC	280 Slater Street	Ottawa	ON	K1P5S9
Ms.	Kathy	Barnes		Don't Waste Michigan	RR#1, 556 Ferand	Sherwood	MI	49089
Mr.	Gordon	Barr	President	Inverhuron & District Ratepayers Association	697 Barclay Road	London	ON	N6K 1K4
Mr.	Tony	Barton	Vice Chair	Bruce Peninsula Environment Group	P.O. Box 1072 P.O. Box 1270	Lion's Head	ON	N0H 1W0
Mr.	Keith	Battler			821 Queen Street	Kincardine	ON	N2Z 2Z4
Ms.	Cheryl	Beamish	Manager	Southampton Chamber Of Commerce		Southampton	ON	N0H 2L0
Mr.	Jim	Beange	President	Lake Huron Fishing Club		Southampton	ON	N0H 2L0
Ms.	Mary Lynn	Becker		Consulate General of Canada	600 Renaissance Center, Ste 1100	Detroit	MI	482-43-1798
Mr.	Larry	Belrose			2634 7th Avenue East	Owen Sound	ON	N4K 6V1
Mr.	Tom	Bergen		Ontario Power Generation	700 University Avenue, TCH19F2	Toronto	ON	M5G 1X6
Ms.	Sara	Bernstein		Michigan Coalition on the Environment and Jewish Life	6735 Telegraph Road, #205	Bloomfield Hills	MI	48301
Mr.	Mike	Berry	President	Bruce Pines Association	126 Sunset Drive, R.R.#1	Port Elgin	ON	N0H 2C5
Mr.	Garry	Biederman		Lake Huron Fishing Club	459 Mill Creed Rd., SS 4	Port Elgin	ON	N0H 2C0
Mr.	Dr. David	Biesenthal		Source Protection Committee	2094 Hwy 9, RR3	Walkerton	ON	N0G 2V0
Mr.	Clarke	Birchard			P.O. Box 490	Chesley	ON	N0G 1L0
Ms.	Gertie	Blake		Bruce County Federation of Agriculture		Hanover	ON	N4N 1P9
Mr.	Eugene	Bourgeois	Inverhuron District Ratepayers Assn	Philosophers Wool Co.		Inverhuron	ON	N0G 2T0
Ms.	Mariah	Branch		Department of Agricultural Economics Michigan State University	105 Cook Hall	East Lansing	MI	48824
Mr.	Bob	Bregman			Box 573	Teeswater	ON	N0G 2S0
Mr.	G.	Brewer			R.R. #1	Annan	ON	N0h 1B0
Mr.	Doug	Brown		Pine River Watershed Improvement Assn.	46 Bell Drive, Lurgan Beach, R.R.#1	Kincardine	ON	N2Z 2X3
Mr.	Ron	Brown	Chief Administative Officer	Town of Saugeen Shores	600 Tomlinson Dr., P.O. Box 820	Port Elgin	ON	N0H 2C0
Ms.	Susan	Bujold		Lake Huron Shoreline Tourism Partners	P.O. Box 545	Paisley	ON	N0G 2T0
Mr.	Edward	Burt		Algoma-Manitoulin Nuclear Awareness	R.R. #1	Kagawong	ON	P0P 1J0
Mr.	Frank	Butler			521 8th Street East	Owen Sound	ON	N4K 1N1
Ms.	Lynda	Cain		Ontario Power Generation	P.O. Box 7000, B21 1580 20th Street East, P.O. Box 967	Tiverton	ON	N0G 2T0
Mr.	Rick	Chappelle	District Manager	Ontario Ministry of the Environment		Owen Sound	ON	N4K 6H6
Mr.	Frank	Caiger-Watson			109 Campbell Crescent	Kincardine	ON	N2Z 1B9
Mr.	Jack	Campbell	President	Huron Fringe Field Naturalists	Box 143, R.R.#1	Kincardine	ON	N2Z 2Y6
Mr.	Chris	Campbell			160 11th Avenue, Apt. 305	Hanover	ON	N4N 2R1
Ms.	Stacy & Becky	Charlton			R.R. #3	Chesley	ON	N0G 1L0

Ms.	Patti	Chmelyk			50 Inglewood Drive	Brampton	ON	L6W 2N2
Ms.	Alexandra	Clarke			1062 12th Street East	Owen Sound	ON	N4K 5Y6
Mr.	Doug	Cleverley		Grey Bruce Renewable Energy Cooperative	310 10th Street West	Owen Sound	ON	N4K 2E6
Mr.	Jim	Coffey	General Manager	Saugeen Valley Conservation Authority		Hanover	ON	N4N 3B8
Mr.	Wayne	Congreave	Chief (Acting)	Emergency Management Ontario	77 Wellesley Street West, P.O. Box 222	Toronto	ON	M7A 1N3
Ms.	Steacy	Cook		Drinking Water Source Protection	774685 Hwy 10	Markdale	ON	N0C 1H0
Mr.	Jim	Cooke			RR #1	Walkerton	ON	N0G 2V0
Mr.	Douglas	Cornett			P.O. Box 122	Marquette	MI	49855
Mr.	George	Costaris		Consulate General of Canada	600 Renaissance Center, Ste 1100	Detroit	MI	482-43-1798
Ms.	Nora	Couch			P.O. Box 223	Wiarton	ON	N0H 2T0
Ms.	Phyllis	Creighton			12 Glenview Avenue	Toronto	ON	M4R 1P6
Ms.	Kay	Cumbow		Citizens for Alternatives to Chemical Contamination	8735 Maple Grove Road	Lake	MI	48632-9511
Mr.	Tyler	Cummings		Foreign Affairs and International Trade Canada US Relations Division	125 Sussex Drive	Ottawa	ON	K1A 0G2
Mr.	Lou	D'Alessandro			101 17th Street East	Owen Sound	ON	N4K 0A5
Mr.	Bruce	Davidson			703 Maple Street P.O. Box 1376	Walkerton	ON	N0G 2V0
Mr.	Martin	Dawborn		Hatch Limited	2800 Speakman Drive	Mississauga	ON	L5K 2R7
Mr.	Greg	Deakin			471 12 Street West	Owen Sound	ON	N4K 3V8
Mr.	Jacques	Delay		ANDRA National Radioactive Waste Management Agency	Route departementale 960 B.P. 9 – 55290	Bure	France	
Mr.	Larry	Demitroff			164 Toronto Street, Box 49	Chatsworth	ON	N0H 1G0
Mr.	John	deRosenroll	Chief Administrative Officer	Municipality of Kincardine		Kincardine	ON	N2Z 2X6
Mr.	Joe	Detzler			RR #3	Teeswater	ON	N0G 2S0
Ms.	Thea	Dickinson			219 Fort York Blvd., Suite 2411	Toronto	ON	M5V 1B1
Ms.	Jayne	Dietrich			RR #5	Mildmay	ON	N0G 2J0
Mr.	Malcom	Dixon	Interim President	Grey Owen Sound Metis Council	370 2nd Avenue East	Owen Sound	ON	N4K 2E9
Ms.	Cherie	Duhaime	Secretary	Port Elgin & Saugeen Township Beachers Organization		Port Elgin	ON	N0H 2C0
Ms.	Kathleen	Dunn		Kincardine Canadian Federation of University Women		Tiverton	ON	N0G 2T0
Mr.	Adrian	Dykstra			RR #1	Southampton	ON	N0H 2L0
Ms.	Anne	Eadie	Chairperson	South Bruce Impact Advisory Committee	RR #4	Ripley	ON	N0G 2R0
Mr.	Gordon	Edwards			53 Dufferin Road	Hampstead	QC	H3X 2X8
Ms.	Lynn	Ehrle			8888 Mayflower Drive	Plymouth	MI	48170
Mr.	Peter	Elder	Director General	CNSC	280 Slater Street	Ottawa	ON	K1P 5S9
Mr.	David	Ellingwood			91 Main Street	Tara	ON	N0H 2N0
Mr.	Robert	Emerson			1007 Concession 12, Huron Twp, RR #3	Ripley	ON	N0G 2R0
Ms.	Shirley	Eskritt			R.R. #2	Teeswater	ON	N0G 2S0
Mr.	Glenn	Estill	Chair	Bruce Peninsula Environment Group	191 Isthmus Bay Rd. P.O. Box 1064	Lion's Head	ON	N0H 1W0
Mr.	Peter	Falconer		Power Workers' Union	244 Eglinton Avenue East	Toronto	ON	M4P 1K2
Mr.	Jim	Farrell			RR #3	Ripley	ON	N0G 2R0
Mr.	Ernie	Farrow			R.R. #6	Wiarton	ON	N0H 2T0
Mr.	Peter	Fawcett	Deputy Director, U.S. Relations Divi	Foreign Affairs and International Trade Canada	125 Sussex Drive	Ottawa	ON	K1A 0G2
Mr.	Alan	Fely			1062 12th Street East	Owen Sound	ON	N4K 5Y6
Mr.	Bruce	Fenton	Fire Chief	Saugeen Shores Fire Department		Port Elgin	ON	N0G 2CO
Ms.	Erica	Ferguson			P.O. Box #1	Heathcote	ON	N0H 1N0
Ms.	Barbara	Fisher	General Manager	Bruce Community Futures Development Corp.	281 Durham Street, P.O. Box 208	Kincardine	ON	N2Z 2Y7
Ms.	Molly	Flanagan	Great Lakes United	Buffalo State College, Cassety Hall	1300 Elmwood Avenue	Buffalo	New York	14222
Ms.	Kiza	Francis	Environmental Assessment Specialist	Canadian Nuclear Safety Commission	280 Slater Street	Ottawa	ON	K1P 5S9

Mr.	Tim	Fraser			P.O. Box 503	Chesley	ON	N0G 1L0
Mr.	Doug	Frieberger		Saugeen Valley Conservation Authority Drain Commissioner	R.R.#1	Hanover	ON	N4N 3B8
Mr.	Fred	Fuller		County of St. Clair Michigan	21 Airport Drive	St. Clair	MI	48079
Dr.	Nava	Garisto		SENES Consultants Limited	121 Granton Drive, Unit 12	Richmond Hill	ON	L4B 3N4
Mr.	Bob	Garnett			305 8th Avenue East	Owen Sound	ON	N4K 3A3
Mr.	Andreas	Gautschi		National Cooperative for the Disposal of Radioactive Was	Hardstrasse 73 5430 Wettingen	Switzerland		
Mr.	Mark	Gerchikov		AMEC NSS Limited	700 University Avenue, 4th Floor	Toronto	ON	M5G 1X6
Ms.	Gwen	Gilbert	Mayor	Town of South Bruce Peninsula	166 Bruce Rd 9, RR #6	Wiarton	ON	N0H 2T0
Ms.	Karen	Gillan		Drinking Water Source Protection	RR 4	Chesley	ON	N0G 2L0
Mr.	John	Gillespie			RR #2	Ripley	ON	N0G 2R0
Mr.	Tom	Godbold	Department of Environmental Qualit	Office of Geological Survey	P.O. Box 30256	Lansing	MI	48909-7756
Mr.	Bill	Goetz	Mayor	Municipality of South Bruce	RR #2	Mildmay	ON	N0G 2J0
Mr. & M	John & Irene	Good			6 Whitefish Blvd, R.R. #3	Wiarton	ON	N0H 2T0
Mr.	Lyle	Goodin		Bleakley House	99 Church Street	Bowmanville	ON	L1C 1T3
Ms.	Sandy	Gott			RR #1	Feversham	ON	N0C 1C0
Mr. & M	Steve & Tracey	Grabouski			2760 5th Avenue West , #301	Owen Sound	ON	N4K 5X6
Mr.	Lloyd	Graham			RR #1	Lucknow	ON	N0G 2H0
Ms.	Cindy	Schmidt	Manager	Bruce Community Development Corporation	281 Durham St.	Kincardine	ON	N2Z 2Y7
Mr.	Robert	Graham		Grey Bruce Health Unit Ex-officio	83 Ferguson Avenue Box 828	Thornbury	ON	N0H 2P0
Mr.	Al	Gray			11 Gray Court	Mildmay	ON	N0G 2J0
Mr.	Howard	Greig			RR #2	Desboro	ON	N0H 1K0
Ms.	Jan	Griffin			P.O. Box 24	Leith	ON	N0H 1V0
Mr.	Paul	Griffin			P.O. Box 24	Leith	ON	N0H 1V0
Mr.	Allan	Grunder			5 Wynford Avenue	Ottawa	ON	K2G 3Z2
Ms.	Nancy	Guest		Drinking Water Source Protection	709 8th Avenue East	Owen Sound	ON	N4K 3A5
Mr.	Pierre	Guimond			350 Sparks Street, Suite 907	Ottawa	ON	K1R 7S8
Mr.	Keith	Gunter		Citizens Resistance at Fermi Two	15784 Whitby Street	Livonia	MI	48154
Ms.	Karen	Gventer			P.O. Box 164	Hepworth	ON	N0H 1P0
Mr.	Trevor	Ham			960 - 3rd Ave East	Owen Sound	ON	N4K 2K9
Mr.	Art	Hanson			1815 Briarwood Drive	Lansing	MI	48917-1773
Ms.	Natalie	Hanson			1815 Briarwood Drive	Lansing	MI	48917-1773
Mr.	David	Harrington	Director, Bruce Power Services	Atomic Energy of Canada Ltd. Bruce Nuclear Power Development		Tiverton	ON	N0G 2T0
Mr.	Jeff	Harti			28 Poplar Crescent	Aurora	ON	L4G 3L3
Mr.	Duncan	Hawthorne	Chief Executive Officer	Bruce Power		Tiverton	ON	N0G 2T0
Ms.	Marion	Hayward			350 7th Avenue East	Owen Sound	ON	N4K 2X1
Mr.	Phil	Hebert		Inverhuron District Ratepayers Association	288 Mill Road, Penthouse 16	Toronto	ON	M9C 4X7
Ms.	Jennifer	Heisz		Women’s Legacy	172 Queen Street South	Paisley	ON	N0H 2N0
Mr.	Bill	Henderson			R.R.# 1	Kincardine	ON	N2Z 2X3
Mr.	Gordon	Henrich			R.R. #1	Mar	ON	N0H 1X0
Ms.	Tina	Hill	Manager	Port Elgin & Saugeen Township Beachers' Org.	P.O. Box 377	Port Elgin	ON	N0H 2C0
Ms.	Alice	Hirt		Don’t Waste Michigan	6677 Summitview Drive	Holland	MI	49423
Mr.	William	Hofer			422 Mallory Beach, R.R. #5	Wiarton		N0H 2T0
Ms.	Kim	Holley			R.R. #2	Wiarton	ON	N0H 2T0
Mr.	Paul	Holmes	Staff Sergeant	South Bruce OPP		Kincardine	ON	N2Z 2Y6
Ms.	Jacquie	Hoornweg	Director	Nuclear Public Affairs	700 University Avenue, 19th Floor	Toronto	ON	M5G 1X6
Mr.	Don	Howard	Project Officer	CNSC	280 Slater Street	Ottawa	ON	K1P 5S9

Ms.	Janice	Hudson	VP	Nuclear Waste Operations	Box 7000, B21	Tiverton	ON	N0G 2T0
Mr.	Ray	Hultay			90 Bruce Road 9	Wiarton	ON	N0H 2T0
Dr.	Dr. Paul	Humphreys		University of Huddersfield, School of Applied Sciences	Queensgate	Huddersfield	United Kingdom	HD1 3DH
Mr.	Prof. Brian	Ikeda		Faculty of Energy Systems & Nuclear Science	2000 Simcoe Street N	Oshawa	ON	L1H 7K4
Mr.	Dave	Inglis	President	BI-AX International Incorporated		Tiverton	ON	N0G 2T0
Mr.	Richard	Jackson		Intera Engineering	11 Venus Crescent	Heidelberg	ON	NOB 1Y0
Mr.	Dale	Jacobs	Enviornment Coordinator	Saugeen Ojibway Nation	R.R.#5	Wiarton	ON	N0H 2T0
Mr.	Wayne	Jamieson	Chief Administrative Officer	Bruce County		Walkerton	ON	N0G 2V0
Ms.	Judith	Johnsrud		Environmental Coalition on Nuclear Power	433 Orlando Avenue	State College	Pennsylvania	16803
Mr.	David	Johnston	Administrator	Municipality of South Bruce		Mildmay	ON	N0G 2J0
Ms.	Veronica	Jones			P.O. Box 15	Hepworth	ON	N0H 1P0
Ms.	Gladys	Jones			P.O. Box 15	Hepworth	ON	N0H 1P0
Chief	Chief Randall	Kahgee			Hwy 21, R.R.#1	Southampton	ON	N0H 2L0
Mr.	Kevin	Kamps		Nuclear Information and Resource Service	6939 Carroll Ave., Suite 340	Takoma Park	Maryland	20912-4423
Mr.	Gary	Karch			251 Kass Street, #714	Niles	MI	49120
Mr.	J.	Keddy			39 Willow Street	Walkerton	ON	N0G 2V0
Mr.	Michael	Keegan		Coalition for a Nuclear Free Great Lakes	P.O. Box 331	Monroe	MI	48161
Mr.	Bill	Keeley		Washington Group International	6055 Marineview Road	King George	Virginia	22485
Ms.	Ann	Kennedy			R.R. #1	Sauble Beach	ON	N0H 2G0
Dr.	Fraser	King		Integrity Corrosion Consulting Ltd.	3396 Stephenson Point Rd.	Nanaimo	BC	V9T 1K2
Ms.	Kay	Klassen		CNSC	280 Slater Street	Ottawa	ON	K1P 5S9
Mr.	Ziggy	Kleinau		Citizens for Renewable Energy	462 East Road, R.R. #4	Lion's Head	ON	N0G 2T0
Ms.	Kim	Kramer			340 4th Avenue Southwest	Owen Sound	ON	N4K 6A1
Mr.	Larry	Kraemer	Mayor	Municipality of Kincardine	1475 Concession 5, R.R. #5	Kincardine	ON	N2Z 2X6
Mr.	Mark	Kraemer		Source Protection Committee	216 Trillium Drive	Port Elgin	ON	N0H 2C2
Mr.	Robert	Krauel	Manager, Environmental Contamina	Environment Canada	4905 Dufferin Street	Downsview	ON	M3H 5T4
Mr.	Vitold	Kreutzer			773126 Highway 10, R.R. #2	Proton Station	ON	N0C 1L0
Mr.	W.C.	Kupferschmidt	General Manager, Decommissioning	AECL Sheridan Park	2251 Speakman Drive	Mississauga	ON	L5K 1B2
Mr.	Gregory	Kuzyk		AECL	P.O. Box 711	Pinawa	MB	R0E 1L0
Mr.	Chris	Laforest	Planning Director	Bruce County	30 Park Street	Walkerton	ON	N0G 2V0
Mr.	Ross	Lamont	Manager Government Relations	Bruce Power		Tiverton	ON	N0G 2T0
Mr.	Michel	Landreville	Project Manager - SPOC DGR Over	Ontario Power Generation	700 University Avenue (H17-B17)	Toronto	ON	M5G 1X6
Mr.	Brent	Lanktree		Source Protection Committee	588463 Grey Road 19 RR #1	Ravenna	ON	N0H 2E0
Ms.	Carolyn	Laude	Senior Advisor, Aboriginal Consultat	Canadian Nuclear Safety Commission	280 Slater Street	Ottawa	ON	K1P 5S9
Ms.	Rosalyn	Lawrence	Assistant Deputy Minister	Ministry of Energy	880 Bay Street	Toronto	ON	M7A 2C1
Mr.	Bob	Leech		AECOM	300 Town Centre Blvd., Suite 300	Markham	ON	L3R 5Z6
Mr.	Aaron	Legge			RR #2	Chesley	ON	N0G 1L0
Mr.	Mike	Leggett	Committee Chair	Kincardine Economic Development Committee	1475 Concession 5	Kincardine	ON	N2Z 2X6
Mr.	Thomas	Leonard		West Michigan Environmental Action Council	1007 Lake Drive SE	Grand Rapids	MI	49506
Mr.	Glen	Lipinski	Addictions, Wellness Coordinator		20 Division Street	Welland	ON	L3B 3Z6
Mr.	Richard	Little		Quintessa Limited	The Hub, 14 Station Road	Henley-on-Thames	United Kingdom	RG9 1AY
Ms.	Brennain	Lloyd		Northwatch	P.O. Box 282	North Bay	ON	P1B 8H2
Mr.	Ben	Lobb			30 Victoria Street	Godrich	ON	N7A 2R6
Mr.	Doug	Lonsdale		Saugeen Field Naturalists		Hanover	ON	N4N 3T1
Ms.	Jackie	Pawlikowski	General Manager	Kincardine & District Chamber of Commerce	721A Queen Street, 3rd Floor, P.O. Box 115	Kincardine	ON	N2Z 2Y6
Dr.	Hazel	Lynn	Medical Officer of Health	Grey – Bruce Health Unit	901, 1st Avenue West	Owen Sound	ON	N4K 4K5
Mr.	Mel	Lyons			506 Huron Terrace	Kincardine	ON	N2Z 2J5
Mr.	George	Macdonald			149 Grosvenor Street South	Southampton	ON	N0H 2L0

Mr.	Ian	MacDonald	President	Steelback Brewery	88 Farrell Drive	Tiverton	ON	N0G 2T0
Mr.	Norman J.	MacGregor	Chairperson	Integrated Energy Development Corp.		Kincardine	ON	N2Z 2Y7
Mr.	Les	MacKinnon	Member	Source Protection Committee	305507 South Line A, RR #3	Priceville	ON	N0C 1W0
Ms.	Florence	Mackesy			R.R. #1	Paisley	ON	N0G 2N0
				Municipality of Kincardine				
Municipality				Fire Department - Kincardine Station	1475 Concession 5, RR 5	Kincardine	ON	N2Z 2X6
Ms.	Sue	MacLeod		Bruce Power Visitor Centre	Box 150 B32	Tiverton	ON	N0G 2T0
Mr.	David	Martin	Energy Coordinator	Greenpeace	33 Cecil Street	Toronto	ON	M5T 1N1
				Department of Civil & Environmental Engineering				
Mr.	Derek	Martin		Resources Engineering Facility	3-071 Markin/CNRL Natural	Edmonton	AB	T6G 2W2
Mr.	Joel	Martin		Tiverton Lions Club		Tiverton	ON	N0G 2T0
Ms.	Patsy	McArthur	President, Historic Saugeen Metis		P.O. Box 1492	Southampton	ON	N0H 2L0
Mr.	Dave	McCauley	Acting Director, Uranium Radioactiv	Natural Resources Canada	580 Booth Street, 17th Floor C2-4	Ottawa	ON	K1A 0E4
Mr.	Steve	McCauley		Place Vincent Massey, Room 1001	351 St. Joseph Blvd.	Hull	QC	K1A 0H3
				Laurentian University				
Mr.	Dougal	McCreath		School of Engineering	Ramsey Lake Road	Sudbury	ON	P3E 2C6
Mr.	Bill	McCulloch			RR #3	Chesley	ON	N0G 1L0
Mr.	Malcolm	McIntosh	Chief Administrative Officer	Town of South Bruce Peninsula		Wiarton	ON	N0H 2T0
Mr.	Milt	McIver	Mayor	Municipality of Northern Bruce Peninsula		Lion's Head	ON	N0H 1W0
				Municipality of Kincardine				
Mr.	Jamie	McKinnon	Fire Chief	Fire Department - Tiverton Station	1475 Concession 5, RR 5	Kincardine	ON	N2Z 2X6
Ms.	Alice	McLaren		Rotary Club of Port Elgin		Port Elgin	ON	N0G 2CO
Mr.	David	McLaren	Coordinator Environment Office	Saugeen Ojibway Nation	R.R.#5	Wiarton	ON	N0H 2T0
Ms.	Teresa	McLellan	Ex-officio	Ministry of Enviroment	3232 White Oak Road	London	ON	N6E 1L8
Mr.	Brant	McNeish	Project Officer, Site Office	Canadian Nuclear Safety Commission	P.O. Box 3000, Bruce A Technical Building	Tiverton	ON	N0G 2T0
Mr.	Brad	McRoberts		Source Protection Committee	341101 Concession 14, RR #3	Wiarton	ON	N0H 2T0
Mr.	Rob	Memery			146350 Side Road 15	Owen Sound	ON	
Commu	Historic Saugeen	Metis	Community Office		204 High Street P.O. Box 1492	Southampton	ON	N0H 2L0
Mr.	John	Miller			Box 791	Wiarton	ON	N0H 2T0
Mr.	Terry	Miller		Lone Tree Council	4649 David Court	Bay City	MI	48706
Mr.	Murray	Miller			25 Huron Ridge Crescent	Kincardine	ON	N2Z 1K2
Mr.	Larry	Miller	MP Bruce-Grey			Owen Sound	ON	N4K 2J1
Mr.	Merv	Misch			R.R. #1	Dobbinton	ON	N0H 1L0
Ms.	Carol	Mitchell	MPP Huron-Bruce		49 Albert St., P. O. Box 1794	Clinton	ON	N0M1L0
					1580 20th Street East, P.O. Box 967			
Mr.	Ian	Mitchell	District Engineer	Ontario Ministry of the Environment		Owen Sound	ON	N4K 6H6
Mr.	Duncan	Moffett			2390 Argentina Road	Mississauga	ON	L5N 5Z7
Mr.	Keith	Mombourquette			225 South Rankin Street, P.O. Box 322	Southampton	ON	N0H 2L0
Ms.	Rosemarie	Morris			191 Rosemary Lane	Ancaster	ON	L9G 2K6
Mr.	Andrew	Müller	President	Society of Energy Workers	425 Bloor Street East, Suite 300	Toronto	ON	M4W 3R4
Mr.	Bill	Murdoch	MPP Bruce-Grey			Owen Sound	ON	N4K 2H8
Mr.	Eamonn	Murphy			P.O. Box 440, 104 Heather Lynn Blvd	Tara	ON	N0H 2N0
Ms.	Mary	Muter	Lake Huron Region, Georgian Bay A	Great Lakes United	136 Dawlish Avenue	Toronto	ON	M4N 1H5
					160 Elgin Street, 22nd Floor			
Ms.	Debra	Myles	Project Manager	Canadian Environmental Assessment Agency		Ottawa	ON	K1A 0H3
Mr.	Kent	Myles			174 Division Street, P.O. Box 962	Wiarton	ON	N0H 2T0
Mr.	Andrew	Needham			23 Oak Street	Walkerton	ON	N0G 2V0
Mr.	Les	Nichols		Source Protection Committee	62 Brownlee Street	Teeswater	ON	N0G 2S0
Ms.	Stefani	Normani		University of Waterloo	200 University Avenue West	Waterloo	ON	N2L 3G1

Prof.	David	Novog	Department of Engineering Physics	McMaster University	1280 Main Street W	Hamilton	ON	L8S 4L8
Mr.	Ken	Ogilvie			203-1750 Bayview Avenue	Toronto	ON	M4G 4H6
Mr.	Ron	Oswald	Mayor	Municipality Of Arran–Elderslie	1925 Bruce Road #10	Chesley	ON	N0G 1L0
Mr.	Peter	Ottensmeyer			27 Chatfield Drive	Don Mills On	ON	M3B 1K6
Mr.	Henry	Paliga			P.O. Box 661	Chesley	ON	N0G 1L0
Mr.	Adam	Paliga			P.O. Box 661	Chesley	ON	N0G 1L0
Mr.	William	Palmer			TRI-LEA GM, R.R. #5	Paisley	ON	N0G 2N0
Mr.	Chuck	Pautler	VP Communications	Ontario Power Generation	700 University Avenue, 19th Floor	Toronto	ON	M5G 1X6
Mr.	Geoff	Peach		Lake Huron Centre for Coastal Conservation		Blyth	ON	N0M 1H0
Mr.	Joe	Pearson			411 East Front Street	New Bern	NC	28560-4916
Mr.	John	Pedlar		Friends of MacGregor Point Provincial Park	R.R. #1	Port Elgin	ON	N0H 2C5
Mr.	Lloyd	Pepper			P.O. Box 245	Chesley	ON	N0G 1L0
Mr.	Bert	Perkins		Saugeen Rail Trail Association		Port Elgin	ON	N0G 2CO
Mr.	Rick	Pettigrew			954 5th Ave East	Owen Sound	ON	N4K 2S1
Ms.	Sara	Pickard			136 2nd Street	Hanover	ON	N4N 1A2
Mr.	Gerald	Poechman			RR #2	Walkerton	ON	N0G 2V0
Mr.	Tony	Porter		Probus Club of Port Elgin & District		Port Elgin	ON	N0G 2CO
Mr.	Wietse	Posthumus			RR #3	Tara	ON	N0H 2N0
Mr. & M	Peter &Rosemary	Preuss			070106 Zion Church Road, R.R. #2	Wiarton	ON	N0H 2T0
				Chair, Board of Directors				
Ms.	Tracy	Primeau		Women's House Serving Bruce and Grey	P. O. Box 760	Kincardine	ON	N2Z 2Z4
Mr.	Robert	Pringle	Warden	Grey County	595 9th Ave., E.	Owen Sound	ON	N4K 3E3
Ms.	Anna	Przychodski			55 Seaborn Road	Brampton	ON	L6V 2B8
Ms.	Catherine	Quigg			838 Harriet Lane	Barrington	IL	60010
Mr.	Richard	Radford	Chief Administrative Officer	Municipality Of Brockton	100 Scott Street	Walkerton	ON	N0G 2V0
Mr.	Stu	Raqke			R.R. #3	Elmwood	ON	N0G 1S0
Mr.	Ken	Raven		Intera Engineering Ltd.	1 Raymond Street, Suite 200	Ottawa	ON	K1R 1A2
Mr.	Martin	Rawlings		Golder Associates	2390 Argentina Road	Mississauga	ON	L5N 5Z7
Mr.	Howard	Ribey			R.R. #4	Paisley	ON	N0G 2N0
Mr.	Don	Richardson		AECOM Limited	512 Woolwich Street, Suite 2	Guelph	ON	N1H 3X7
Mr.	Mike	Rinker		CNSC	280 Slater Street	Ottawa	ON	K1P 5S9
Ms.	Joanne	Robbins		Lake Huron Shoreline Tourism Partners		Port Elgin	ON	N0G 2CO
Ms.	Cathy	Robins	Chief Administrative Officer	Municipality of Northern Bruce Peninsula		Lion's Head	ON	N0H 1W0
Mr.	Robert	Rodgers			RR #1	Mar	ON	N0H 1X0
Gen.	Richard	Rohmer			32 Callary Cr.	Collingwood	ON	L9Y 4Y1
Mr.	Norman	Rubin		Energy Probe	225 Brunswick Avenue	Toronto	ON	M5S 2M6
Ms.	Jean	Ruprechl			P.O. Box 623	Chesley	ON	N0G 1L0
Ms.	Pamela	Rups			2705 Pine Ridge Road	Kalamazoo	MI	49008
Mr.	Peter	Sargent		AECL Whiteshell, Waste Technology Division				
Mr. & M	Colin & Cindy	Saunders			R.R. #3	Chesley	ON	N0G 1L0
Ms.	Jenni-Lynn	Schiestel			33 1st Avenue	Chesley	ON	N0G 1L0
Mr.	Lloyd	Schnurr			RR #3	Walkerton	ON	N0G 2V0
Mr.	James	Scongack			P.O. Box 1540, B10	Tiverton	ON	N0G 2T0
Mr.	Gary	Senior	Manager, Environmental Planning a	Saugeen Valley Conservation Authority	R.R. #1	Hanover	ON	N4N 3B8
Mr.	Dave	Shier		Canadian Nuclear Workers Council	244 Eglinton Avenue East	Toronto	ON	M4P 1K2
Prof.	David	Shoesmith	Department of Chemistry	University of Western Ontario	1151 Richmond Street, Chemistry Bldg. Roo	London	ON	N6A 5B7
Mr.	David	Shouldice			R.R. #2	Shallow Lake	ON	N0H 2K0
Ms.	Veronica	Smith			R.R. #5	Cape Croker	ON	N0H 2T0
Mr.	Allan	Smith			RR #2	Tara	ON	N0H 2N0
Mr.	Don	Smith	Project Manager	Drinking Water Source Protection	164 2nd Avenue	Hanover	ON	N4N 3R3

Ms.	Donna	Smith		South-Port Optimist Club		Southampton	ON	N0H 2L0
Mr.	Mike	Smith	Mayor	Town of Saugeen Shores		Port Elgin	ON	N0G 2CO
				Executive Director				
Mr.	Lawrence	Solomon		Energy Probe Research Foundation	225 Brunswick Avenue	Toronto	ON	M5S 2M6
Mr.	Tim	Spencer			R.R. #4	Lion's Head	ON	N0H 1W0
Mr.	Derek	Stack	Executive Director	Great Lakes United	3388 Rue Adam	Montreal	QC	H1W 3Z3
Mr.	Paul	Steckle			30 Victoria Street North	Goderich	ON	N7A 2R6
Mr.	Marvin	Stemeroff			512 Woolwich Street, Unit 2	Guelph	ON	N1H 3X7
Mr.	Shawn-Patrick	Stensil			250 Dundas Street West, Suite 605	Toronto	ON	M5T 2Z5
Ms.	Doris	Stewart			R.R. #5	Wiarton	ON	N0H 2T0
Mr.	Thor	Strong	Chief Radiological Protection and M	Dept. of Environmental Quality	PO Box 30241	Lansing	Michigan	48909
Mr.	Russell	Strong			P.O. Box 782	Chesley	ON	N0G 1L0
Mr.	Congressman Bart	Stupak			2352 Rayburn House Office Building	Washington	DC	20515
				University of Waterloo				
Mr.	Edward A.	Sudicky		Department of Earth and Environmental Sciences	200 University Avenue West	Waterloo	ON	N2L 3G1
Ms.	Laurie	Swami	Director, Licensing & Environment	Ontario Power Generation	1315 Pickering Parkway, 3rd Floor	Pickering	ON	L1V 7G5
				University of Waterloo				
Mr.	John	Sykes		Department of Earth and Environmental Sciences	200 University Avenue West	Waterloo	ON	N2L 3G1
				NDP Environment Critic				
Mr.	Peter	Tabuns		MPP Toronto Danforth	421 Donlands Avenue	Toronto	ON	M4J 3S2
				CNSC, Geosciences & Environmental Compliance Div.				
Mr.	C.	Taylor	Director		280 Slater Street	Ottawa	ON	K1P 5S9
Mr.	Dale	Thompson		Drinking Water Source Protection	9 Hobson's Harbour Drive, RR #1	Lion's Head	ON	N0H 1W0
Ms.	Patsy	Thompson		280 Slater Street	P.O. Box 1046, Station B	Ottawa	ON	K1P 5S9
Ms.	Janice	Thomson-Kylie	Chair	Green-Horizons	P.O. Box 1593	Port Elgin	ON	N0H 2C0
Dr.	Mike	Thorne	Mike Thorne & Associates	Abbotsleigh, Kebroyd Mount	Sowery Bridge, Halifax,	West Yorkshire	UK	HX6 3JA
Mr.	Chris	Tomsett	Park Superintendent	MacGregor Point Provincial Park		Port Elgin	ON	N0H 2C5
Ms.	Sheila	Tooze		Embassy of Canada	501 Pennsylvania Ave., N.W	Washington	D.C.	20001-2114
Mr.	Brian	Torrie	Director, Environmental Assessmen	CNSC	280 Slater Street	Ottawa	ON	K1P 5S9
Ms.	Norah	Toth		Macgregor Point Provincial Park	R.R. #1	Port Elgin	ON	N0H 2C0
Mr.	Mike	Traynor	Chair	Source Protection Committee	324010 Concession 5, RR #1	Annan	ON	N0H 1B0
Ms.	Roberta	Trelford	Community Emergency Managemer	Municipality of Kincardine	1475 Concession 5, R.R. #5	Kincardine	ON	N2Z 2X6
Mr.	Bill	Twaddle			2771 9th Avenue East	Owen Sound	ON	N4K 3H6
Mr.	Mitch	Twolan	Mayor	Township of Huron-Kinlsos		Kincardine	ON	N2Z 2X3
Ms.	Lorne	Underwood			RR #1	Clifford	ON	N0G 1M0
Ms.	Emily	Vandermeulen			205-795 5th Avenue East	Owen Sound	ON	N4K 2R7
Mr.	Peter	Victor			4700 Keele Street	North York	ON	M3J 1P3
Mr.	Michael	Wainscott			402 – 1st Street South	Hanover	ON	N4N 3T8
Ms.	Mary Rose	Walden	Administrator	Township of Huron-Kinlsos		Kincardine	ON	N2Z 2X3
Mr.	Bob	Waldon	Director, Natural Resources, Enviror	Metis Nation of Ontario	877 The Grange Sideroad	Caledon	ON	L7C 0E4
Mr.	Larry	Walpole			P.O. Box 402	Chesley	ON	N0G 1L0
Mr.	Ray	Walser	President	Lake Huron Fishing Club	P.O. Box 355	Southampton	ON	N0H 2L0
Mr.	Martyn R	Wash	President	Organization of CANDU Industries (OCI)	1 Yonge Street	Toronto	ON	M5E 1W7
Mr.	Don	White		Rotary Club of Southampton	230 Tyendinaga Drive	Southampton	ON	N0H 2L0
Mr.	Mac	Williams			763 2nd Avenue West	Owen Sound	ON	N4K 4M2
Mr.	E.	Wilson			R.R. #2	Kemble	ON	N0H 1S0
Mr.	Tomasz	Wlodarczyk		AECOM Limited	300 Town Centre Blvd., Suite 300	Markham	ON	L3R 5Z6
Ms.	Kathryn	Woeller	Distric Planner Midhurst District	Ministry of Natural Resources	2284 Nursery Road	Midhurst	ON	L0L 1X0

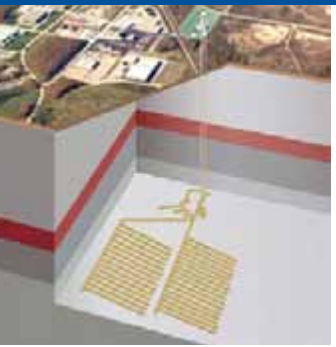
Mr.	Werner	Wolf			R.R. #3	Wiarton	ON	N0H 2T0
Mr. & M	Becky & Robert	Woolvett			72 Hansen Drive, R.R. #4	Wiarton	ON	N0H 2T0
Mr. & M	Geoff & Donna	Wright			R.R. #3	Wiarton	ON	N0H 2T0
Mr.	Ken	Yates			R.R. #2	Owen Sound	ON	N4K 5N4
Mr.	Ernest	Young			RR #3	Tiverton	ON	N0G 2T0
Mr.	Bruce	Young	Director, Panel Management	Canadian Environmental Assessment Agency	160 Elgin Street, Place Bell Canada, 22nd Fl	Ottawa	ON	K1A 2E6
Ms.	Carl	Zettel		South Bruce Municipality	R.R. #1	Mildmay	ON	N0G 2S0
Mr.	Tony	Zettel			R.R. #5	Mildmay	ON	N0G 2J0
Ms.	Barb	Zettler			RR #3	Teeswater	ON	N0G 2S0
Sierra Club of Canada				Sierra Club of Canada	412 - 1 Nicholas Street	Ottawa	ON	K1N 7B7
General Manager			General Manager	Saugeen Shores Chamber of Commerce	559 Goderich Street	Port Elgin	ON	N0H 2C4
Southampton Rotary Club				Southampton Rotary Club	P.O. Box 1101	Southampton	ON	N0H 2L0
Friends of the Earth Canada				Friends of the Earth Canada	260 St. Patrick Street, Suite 300	Ottawa	ON	K1N 5K5
Mr.	J.	Tully		PROBUS Club of Kincardine c/o J. Tully	R.R.# 5	Kincardine	ON	K2Z 2X6
Canadian Environmental Law Association				Canadian Environmental Law Association	130 Spadina Avenue P.O. Box 80523 RPO White Shields	Toronto	ON	M5V 2L4
International Institute of Concern for Public Health				International Institute of Concern for Public Health	2300 Lawrence Avenue East	Toronto	ON	M1P 4Z5
Mr.	Paul	Rigby	President	Rotary Club of Kincardine	P. O. Box 113	Kincardine	ON	N2Z 2X6
National Council of Women in Canada				National Council of Women in Canada	Box 1590	Niagara-on-the-Lake	ON	L0S 1J0
Sergeant			Sergeant	Communications Centre County of Wellington OPP	P. O. Box 3250	Mount Forest	ON	N0G 2L0

YOU ARE INVITED TO OUR DGR OPEN HOUSES

On behalf of Ontario Power Generation (OPG), the Nuclear Waste Management Organization (NWMO) invites you to participate in our open houses. The sessions are about OPG's Deep Geologic Repository (DGR) Project for low and intermediate level (L&ILW) radioactive waste. OPG has contracted NWMO to undertake the regulatory approvals process for this project to be located at the Bruce site.

At this third round of Open Houses we look forward to providing you with updated information on the DGR Project, to answering your questions, and hearing your views. Your comments will be addressed in the environmental impact statement submitted under the Canadian Environmental Assessment Act for the DGR Project.

KEEPING YOU INFORMED ABOUT OPG'S DGR PROJECT FOR L&ILW WASTE



nwmo
NUCLEAR WASTE MANAGEMENT ORGANIZATION
SOCIÉTÉ DE GESTION DES DÉCHETS NUCLÉAIRES

ONTARIO POWER GENERATION

Open Houses will be held at the locations listed below. Open House hours of operation are 4:00 p.m. to 8:00 p.m. We look forward to seeing you there.

DATES AND LOCATIONS

Kincardine
Monday November 2
Kincardine Davidson Centre
601 Durham Street

Ripley
Tuesday November 3
Ripley Huron Community Centre
17 Queen Street

Walkerton
Wednesday November 4
Victoria Jubilee Hall
111 Jackson Street S

Port Elgin
Thursday November 5
Colonial Motel
235 Goderich Street

Chesley
Monday November 9
Chesley Fire Hall
North end of Chesley, Bruce Rd. 10

Owen Sound
Tuesday November 10
Bayshore Community Centre
1900 3rd Avenue E

Wiarton
Thursday November 12
Wiarton & District Community Centre
531 Scott Street

* Opportunities for engagement in Aboriginal communities will be welcomed at their request.

FOR MORE INFORMATION

Please call Marie Wilson at 519-368-1639 or write to us at the Nuclear Waste Management Organization (NWMO), Box 7000, B21, Tiverton, ON, N0G 2T0 or visit our project website at: www.nwmo.ca/dgr

nwmo
NUCLEAR WASTE MANAGEMENT ORGANIZATION
SOCIÉTÉ DE GESTION DES DÉCHETS NUCLÉAIRES

Printed on 100% recycled paper

ONTARIO POWER GENERATION

Post Card Mailing for November 2009 Open Houses		
Kincardine P.O.	All Postal Codes	5339
Owen Sound P.O.	All Postal Codes	14029
Chepstow P.O.	N0G 1L0	146
Clifford P.O.	N0G 1M0	941
Elmwood P.O.	N0G 1S0	720
Formosa P.O.	N0G 1W0	255
Holyrood P.O.	N0G 2B0	208
Mildmay P.O.	N0G 2J0	1007
Chesley P.O.	N0G 1L0	1429
Neustadt P.O.	N0G 2M0	403
Paisley P.O.	N0G 2N0	958
Ripley P.O.	N0G 2R0	791
Teeswater P.O.	N0G 2S0	1989
Tiverton P.O.	N0G 2T0	1325
Walkerton P.O.	N0G 2V0	3710
Allenford P.O.	N0H 1A0	499
Annan P.O.	N0H 1B0	393
Bognor P.O.	N0H 1E0	212
Kemble P.O.	N0H 1S0	426
Leith P.O.	N0H 1V0	100
Lions Head P.O.	N0H 1W0	1059
Mar P.O.	N0H 1X0	537
Miller Lake P.O.	N0H 1Z0	267
Port Elgin P.O.	N0H 2C0	4499
Shallow Lake P.O.	N0H 2K0	666
Southampton P.O.	N0H 2L0	2406
Stokes Bay P.O.	N0H 2M0	90
Tara P.O.	N0H 2N0	1427
Tobermory P.O.	N0H 2R0	712
Wiarton P.O.	N0H 2T0	4915
TOTAL		51,458

YOU ARE INVITED TO OUR DGR OPEN HOUSES

On behalf of Ontario Power Generation (OPG), the Nuclear Waste Management Organization (NWMO) invites you to participate in our Open Houses. The sessions are about OPG's Deep Geologic Repository (DGR) Project for Low and Intermediate Level (L&IL) radioactive waste.

We are looking forward to providing you with updated information on the L&IL DGR project. Helpful staff will be available to hear your views and answer any questions. Your comments will be addressed in the Environmental Impact Statement to be submitted under the Canadian Environmental Assessment Act for the L&IL DGR project.

DATES AND LOCATIONS

Open Houses will be held at the locations listed below between 4:00–8:00 p.m.

Kincardine
Monday November 2
Kincardine Davidson Centre
601 Durham Street

Ripley
Tuesday November 3
Ripley Huron Community Centre
17 Queen Street

Walkerton
Wednesday November 4
Victoria Jubilee Hall
111 Jackson Street S

Port Elgin
Thursday November 5
Colonial Motel
235 Goderich Street

Chesley
Monday November 9
Chesley Fire Hall
North end of Chesley,
Bruce Rd.10

Owen Sound
Tuesday November 10
Bayshore Community Centre
1900 3rd Avenue E

Wiarton
Thursday November 12
Wiarton & District Community Centre
531 Scott Street

*Opportunities for Aboriginal Communities will be welcomed at their request.

FOR MORE INFORMATION

Please call Marie Wilson at 519-368-1639 or write to us at the Nuclear Waste Management Organization (NWMO), Box 7000, B21, Tiverton, ON, N0G 2T0 or visit our project website at: www.nwmo.ca/dgr

KEEPING YOU INFORMED ABOUT OPG'S DGR PROJECT FOR L&IL WASTE

nwmo

ONTARIO POWER GENERATION

(continued)

Third round of open houses into Deep Geologic Repository project begin Monday

Science

To Comment on this article Click Here

On behalf of the Ontario Power Generation (OPG), the Nuclear Waste Management Organization (NWMO) is hosting a third round of open houses into the Deep Geologic Repository project for low-level and intermediate-level nuclear waste. The NWMO has been contracted to undertake the regulatory approvals process for this project to be located at the Bruce Nuclear site.

At these open houses, the public will be provided with updated information on the repository project; people can ask questions and make their views known.

The open houses run 4-8 p.m. The first one will be at the Davidson Centre in Kincardine, Monday, Nov. 2; followed by one at the Ripley-Huron Community Centre, Tuesday, Nov. 3; at Victoria Jubilee Hall in Walkerton, Wednesday, Nov. 4; the Colonial Motel in Port Elgin, Thursday, Nov. 5; the Chesley Fire Hall, Monday, Nov. 9; Bayshore Community Centre in Owen Sound, Tuesday, Nov. 10; and Wiarton and District Community Centre, Thursday, Nov. 12.

For more information, contact Marie Wilson at 519-368-1639, write the NWMO at Box 7000, B21, Tiverton, Ontario, N0G 2T0; or visit the project website at www.nwmo.ca/dgr.

Click Saugeen Times
Click Kincardine Times
Click CCNews

Friday, October 30, 2009

Print Schedule for 2009 Open House Advertising

PAPER	Contact	SPEC	SIZE	INSERTION DATES
Kincardine News	John Bauman 519-396-2963	B&W	4.9 x 6.2 inches	October 20
Kincardine Independent	Eric Howald 519-396-3111	B&W	5 x 7 ¾ inches	October 20
Lucknow Sentinel	John Bauman 519-396-2963	B&W	4.9 x 6.2 inches	November 3
Shoreline Beacon	John Bauman 519-396-2963	B&W	4.9 x 6.2 inches	November 3
Wiarton Echo	John Bauman 519-396-2963	B&W	4.9 x 6.2 inches	November 3, November 12
Walkerton Herald Times	April Wells 519-881-1600	B&W	5.1 x 6.2	October 28, November 4
Sun Times (Owen Sound)	Louise Kazariane 519-372-4344	B&W	5 11/16 x 6 ¾ inches	November 7, 9, 10

Copy:

Headline: **You are invited to our DGR open houses**

All of the ads will have the following copy above the photo collage:

The Nuclear Waste Management Organization (NWMO), on behalf of Ontario Power Generation (OPG), invites you to participate in our Open Houses on the proposed Low and Intermediate Level Waste Deep Geologic Repository project (L&IL DGR).

We are looking forward to providing you with updated information on the L&IL DGR project. Helpful staff will be available to hear your views and answer any questions. Your comments will be addressed in the Environmental Impact Statement to be submitted under the Canadian Environmental Assessment Act for the L&IL DGR project.

Photo collage – try to stick to the postcard as much as possible, but you may have to drop a photo to make it fit the ad size.

OPG's logo to be on the bottom right with NWMO on the bottom left as per the postcard

Open House Schedule: Print the schedule as per the postcard with the same time, dates and locations; however, as the open houses occur, some will fall off the schedule, necessitating a change in the copy – see below:

Kincardine News –Advertise all of the open houses in both ads – Oct. 20, Oct. 27

Kincardine Independent – Advertise all of the open houses in both ads – Oct. 20, Oct. 27

Luc know Sentinel – Advertise all of the open houses on October 27, Drop Kincardine in Nov. 3 edition

Shoreline Beacon – Advertise all of the open houses on October 27, Drop Kincardine in Nov. 3 edition

Wiarton Echo – Advertise all of the open houses in Nov. 3 ad except for Kincardine, the Nov. 12 ad will only advertise the Wiarton open house and the ad copy will have to change from **You are invited to our DGR open houses** to **You are invited to our DGR open house – the copy in the first paragraph will also change from open houses to open house**

Walkerton Herald Times – Advertise all of the open houses on Oct. 28 and drop both Kincardine and Ripley for the Nov. 4 edition

Sun Times – Advertise only the Chesley, Owen Sound and Wiarton open houses on November 7 & 9, and then drop Chesley so that the November 10 ad just advertises Owen Sound and Wiarton.

baysh●re br●adcasting

Box 280 270 Ninth Street East Owen Sound ON N4K 5P5
Phone 519-376-2030 Fax 519-371-4242
bayshore@bayshorebroadcasting.ca

NUCLEAR WASTE MANAGEMENT [illegible]
BOX [illegible]
TIVERTON ONTARIO
[illegible]

STATEMENT

DATE 11/30/09

THANK YOU FOR KEEPING YOUR
BAYSHORE ACCOUNT CURRENT !

ANY QUESTIONS ON YOUR STATEMENT
PLEASE CONTACT [illegible]
ACCOUNTS RECEIVABLE [illegible] EXT [illegible]
OR YOUR MARKETING REP

ACCOUNT NUMBER 65430

AMOUNT DUE	AMOUNT PAID
$3,66[illegible]	

TERMS: Net. A finance charge of 2% per month (24% annual rate) will be charged on the unpaid balance of past due accounts.

INVOICE NUMBER	INVOICE DATE	DESCRIPTION	AMOUNT	BALANCE
[illegible]	11/[illegible]	Contract #0046968 10/30/09 to 11/12/09	CKYC-FM	
		[illegible] OPEN HOUSES		
		11/16 45 30's @ $47.00	$2,115.00	
		11/16 1 30's No Charge	$0.00	
		Total Charge:	$2,115.00	
		11/16 GST Tax	$105.75	
		BALANCE OF INVOICE #[illegible]		$2,220.75
121156	11/16/09	Contract #0046968 11/8/09 to 11/12/09	CFOS-AM	
		[illegible] OPEN HOUSES		
		11/16 20 30's @ $23.00	$460.00	
		11/16 2 30's No Charge	$0.00	
		Total Charge:	$460.00	
		11/16 GST Tax	$23.00	
		BALANCE OF INVOICE #121156		$483.00
[illegible]	11/16/09	Contract #0046968 10/30/09 to 11/12/09	[illegible]-FM	
		[illegible] OPEN HOUSES		
		11/16 40 30's @ $23.00	$920.00	
		11/16 4 30's No Charge	$0.00	
		Total Charge:	$920.00	
		11/16 GST Tax	$46.00	
		BALANCE OF INVOICE #[illegible]		$966.00

DATE	PREVIOUS BALANCE		
[illegible]	[illegible]		

CURRENT	30 DAYS	60 DAYS	90+ DAYS	PAY THIS AMOUNT
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

Invoice for Marie

The Haliburton Broadcasting Group

50-2 Balls Drive, Bracebridge, ON P1L 1T1

11/5/2009

Station: CIYN 95.5 FM

Account #: 67168 Contract #:

Account Name: Nuclear Waste Management Organization

Agency Name:

Address: Box 7000, B21

City: Tiverton PROVINCE: ON

Postal Code: N2Z 2T0

Contact Name: Marie Wilson

Phone#: 519-361-2673

Fax #:

Email Address: mwilson@nwmo.ca

Account Exec: Ryan Berry

Rep House:

COPY INFO:

OF CARTS

Product: Open Houses

Ad Name: OPG

Station Demo

Local

In house

Card #'s 1675

New Account [ ] Revision [ ] Cancel [ ]

Purchase Order #

Conflict Code: 5-15

BILLING INFORMATION:

*** Package Name: Fall 2009

	YES	NO
Make Good		
CO-OP		
CONTRA		

sut	start date	end date	len	flight	Daypart	Mon	Tues	Wed	Thur	Fri	Sat	Sun	Rate	#cms/wk	# wks	total cm	$ total
cm	Oct 31/09	Nov 1/09	30		6a-7p						6	6	$20.00	12	1	12	$240.00
cm	Nov 2/09	Nov 8/09	30		6a-7p	6	6	6	6	6	6	6	$20.00	42	1	42	$840.00
cm	Nov 9/09	Nov 9/09	30		6a-7p	6							$20.00	6	1	6	$120.00
													$0.00	0	0	0	$0.00
													$0.00	0	0	0	$0.00
													$0.00	0	0	0	$0.00
													$0.00	0	0	0	$0.00
													$0.00	0	0	0	$0.00
													$0.00	0	0	0	$0.00
													$0.00	0	0	0	$0.00
													$0.00	0	0	0	$0.00
													$0.00	0	0	0	$0.00

GRAND TOTAL OF CM'S: 60

Jan		July	
Feb		Aug	
Mar		Sept	
April		Oct	
May		Nov	
June		Dec	

Notes to Traffic:

Commercial will be written and produced in Kincardine Studio...

GROSS	$1,200.00
NET	$1,200.00
G.S.T.	$60.00
$TOTAL	$1,260.00

STO	

GST # 886541759

CONDITIONS: NET DUE PAYABLE 30 DAYS

CREDIT TERMS: OVERDUE ACCOUNTS ARE SUBJECT TO A SERVICE CHARGE OF 1.5% PER MONTH

Fourteen days written notice required for cancellation or revision of this contract. Advertisers terminating contract before expiry date or usage will be short rated to appropriate category when applicable or to be charged in its entirety.

All orders are net of agency commision unless otherwise stated.

This order is subject to compliance of all federal, provincial, municipal laws and regulations of the CRTC now in force or which may be enacted

The Advertisers orders and covenants to pay for the schedule of broadcasts described above subject to the standard conditions listed above

Advertiser: Nuclear Waste Management Organization

Date: Friday, October 09, 2009

Salesperson: Ryan Berry

Date: Friday, October 09, 2009

Approved By:

Entered By:

Blackburn Radio Inc.
215 Carling Terrace, Wingham, Ontario N0G 2W0
Tel. 519-357-1310 Fax 519-357-1897
GST #R892978552

INVOICE

NUMBER:

INVOICE DATE:
PAGE: TYPE:
ACCOUNT:
CONTRACT:
PRODUCT:

TERMS: Net. A finance charge of 1.5% per month (18% annual rate) will be charged on the unpaid balance of past due accounts

PAY THIS AMOUNT: **BY:**

Radio Advertising for 2009 DGR open houses:

Radio script for the following dates to be broadcast by **The Coast**, **CKNX – FM 102, AM 920; CFOS – Country 93 and 97.7 The Beach**: Oct. 31, Nov. 1, 6, 7, 8,

You're invited. On behalf of Ontario Power Generation, the Nuclear Waste Management Organization is hosting Environmental Assessment Open Houses in seven Bruce communities to review plans for the safe, long-term management of low and intermediate-level nuclear waste in the proposed Deep Geologic Repository at the Bruce site. This is your opportunity to ask questions and get information. For details of where and when, look in your local newspaper or visit the DGR project website at www.nwmo.ca/dgr

November 2– The Coast; CKNX – FM 102, AM 920; CFOS – Country 93 and 97.7 The Beach

You're invited. On behalf of Ontario Power Generation, the Nuclear Waste Management Organization is hosting an Environmental Assessment Open House to review plans for the safe, long-term management of low and intermediate-level nuclear waste in the proposed Deep Geologic Repository at the Bruce site. This is your opportunity to ask questions and get information. Visit NWMO's open house **today in Kincardine at the Davidson Centre** from 4PM to 8PM. For more information, please visit www.nwmo.ca/dgr

November 3 – The Coast; CKNX – FM 102, AM 920; CFOS – Country 93 and 97.7 The Beach

You're invited. On behalf of Ontario Power Generation, the Nuclear Waste Management Organization is hosting an Environmental Assessment Open House to review plans for the safe, long-term management of low and intermediate-level nuclear waste in the proposed Deep Geologic Repository at the Bruce site. This is your opportunity to ask questions and get information. Visit our open house **today in Ripley at the Ripley Huron Community Centre** from 4PM to 8PM. For more information, please visit www.nwmo.ca/dgr

November 4- The Coast; CKNX – FM 102, AM 920; CFOS – Country 93 and 97.7 The Beach

You're invited. On behalf of Ontario Power Generation, the Nuclear Waste Management Organization is hosting an Environmental Assessment Open House to review plans for the safe, long-term management of low and intermediate-level nuclear waste in the proposed Deep Geologic Repository at the Bruce site. This is your opportunity to ask questions and get information. Visit our open house **today** in **Walkerton at Victoria Jubilee Hall** from 4PM to 8PM. For more information, please visit www.nwmo.ca/dgr

November 5 – The Coast; CKNX – FM 102, AM 920; CFOS – Country 93 and 97.7 The Beach

You're invited. On behalf of Ontario Power Generation, the Nuclear Waste Management Organization is hosting an Environmental Assessment Open House to review plans for the safe, long-term management of low and intermediate-level nuclear waste in the proposed Deep Geologic Repository at the Bruce site. This is your opportunity to ask questions and get information. Visit our open house **today in Saugeen Shores at the Colonial Motel** from 4PM to 8PM. For more information, please visit nwmo.ca/dgr

November 9 - The Coast; CKNX – FM 102, AM 920; CFOS – Country 93 and 97.7 The Beach

You're invited. On behalf of Ontario Power Generation, the Nuclear Waste Management Organization is hosting an Environmental Assessment Open House to review plans for the safe, long-term management of low and intermediate-level nuclear waste in the proposed Deep Geologic Repository at the Bruce site. This is your opportunity to ask questions and get information. This is your opportunity to ask questions and get information. Visit our open house **today** in **Chesley at the Chesley Fire Hall** from 4PM to 8PM. For more information, please visit www.nwmo.ca/dgr

November 10 –CKNX – FM 102, AM 920; CFOS – Country 93 and 97.7 The Beach

You're invited. On behalf of Ontario Power Generation, the Nuclear Waste Management Organization is hosting an Environmental Assessment Open House to review plans for the safe, long-term management of low and intermediate-level nuclear waste in the proposed Deep Geologic Repository at the Bruce site. This is your

opportunity to ask questions and get information. Visit our open house **today** in **Owen Sound at the Bayshore Community Centre** from 4PM to 8PM. For more information, please visit www.nwmo.ca/dgr

November 12 –CKNX – FM 102, AM 920; CFOS – Country 93 and 97.7 The Beach

You're invited. On behalf of Ontario Power Generation, the Nuclear Waste Management Organization is hosting an Environmental Assessment Open House to review plans for the safe, long-term management of low and intermediate-level nuclear waste in the proposed Deep Geologic Repository at the Bruce site. This is your opportunity to ask questions and get information. Visit our open house **today** in **Wiarton at the Wiarton and District Community Centre** from 4PM to 8PM. For more information, please visit www.nwmo.ca/dgr

Keeping you connected to the DGR

Marie Wilson

For the fourth year in a row, Ontario Power Generation (OPG) sponsored the Canadian Raptor Conservancy's Birds of Prey free-flying presentation at Pumpkinfest where birds such as the Golden Eagle, Red-Tailed Hawk and Peregrine Falcon performed three shows daily for the two-day event held on Oct. 3 and 4. In keeping with both tradition and the overall bird theme of the Pumpkinfest sponsorship, OPG provided shelter in their tent for interest groups that work with wildlife and habitats such as Friends of McGregor, Saugeen Conservation Authority and Marine Heritage. "OPG's Feathered Friends" definitely provided an informative, educational experience on several levels for the throngs of enthusiastic Pumpkinfest crowds who always attend this well known event, which was voted one of Ontario's top events, and winner of Festival and Events Ontario's Community Involvement Award.

Many of those who came to see OPG's Feathered Friends this year watched from beneath the cover of their umbrellas because of the aggressive rain which came in intervals; however, every cloud really does have a silver lining though, and most of those who came to watch the birds ended up in the OPG tent for some respite from the elements. So, although the attendance in the tent is always excellent, the inclement weather definitely caused a groundswell in the number of visitors going through to check out the wildlife displays as well as the Nuclear Waste Management Organization's (NWMO) exhibit on OPG's proposed low and intermediate level waste deep geologic repository (L&ILW DGR). And new to OPG's tent this year, was the addition of a new hands-on (literally) activity where participants were invited to make a bird feeder, again in keeping with the bird theme.

Most of you will be aware by now of the drama that unfolded at the big tent where a 1,678 - pound pumpkin tipped the scales to break the Canadian record by 141.5 lbs., and was just 11 pounds shy of the world record, but for those of us who were helping with the bird feeder line in the OPG tent, it felt like we were on the verge of setting our own record. About 504 participants - mostly wee ones - made their way through the line in front of the OPG display to: pick a cone (filled with lard), dip it in bird seed, wrap it in burlap and have it tied with a string long enough for hanging purposes to produce an epicurean feast fit for our avian feathered friends. As you might imagine, there was a lot of scooping of lard and tying of string by OPG and NWMO volunteers alike, who thoroughly enjoyed this interaction with the public – world record or not.

As a side note, it isn't by coincidence that OPG and NWMO employees were working side by side at Pumpkinfest. Given that NWMO is managing OPG's L&ILW DGR through the regulatory approvals process on OPG's behalf, there is a lot of interaction between employees from both companies. And just to be really clear, OPG is owner, future licensee and operator of the L&ILW DGR.

OPG volunteers from left, Lynda Cain, Dave Bell and Nancy Dillon prepare the "Make a Bird Feeder Station" in the OPG tent during Pumpkinfest.

And speaking of the L&ILW DGR, NWMO, on behalf of OPG, will be hosting a series of seven open houses at the beginning of November and you are invited to attend. Helpful staff will be available to hear your views, answer any questions and provide you with an update on the project. Open houses will be held from 4 – 8 p.m. at the following dates and locations: Kincardine - Kincardine Davidson Centre on Nov. 2, Ripley-Ripley Huron Community Centre on Nov. 3, Walkerton – Victoria Jubilee Hall on Nov. 4, Port Elgin – Colonial Motel on Nov.5, Chesley – Chesley Fire Hall on Nov. 9, Owen Sound – Bayshore Community Centre on Nov. 10, Wiarton – Wiarton & District Community Centre on Nov. 12. Hope to see you there and for more information give me a call at 519 368-1639 or visit our project website at: www.nwmo.ca/dgr. Opportunities for Aboriginal Communities will be welcomed at their request.

Before closing off, I want to mention that Bruce County Warden Bill Goetz was honoured at the annual Warden's Banquet on Oct. 24 at the Knight's of Columbus Hall between Mildmay and Walkerton. Known for his dry sense of humour, I'm sure Bill enjoyed the event where toasts, speeches and humour are never in short supply nor more appreciated. Congratulations to Warden Goetz!

Appendix B

Newspaper Coverage

bayshore broadcasting
NEWS CENTRE

New Open Houses for DGR

Monday, November 2, 2009 by James Morgan

You have the opportunity to find out the latest on plans for the Deep Geological Repository (DGR) at the Bruce nuclear site near Tiverton.

The planned facility will be 680 metres underground and will house low and intermediate level radioactive waste from nuclear reactor facilities across Ontario.

A series of open houses takes place over the next two weeks.

The first one is today from 4 PM to 8 PM in Kincardine at the Davidson Centre.

The next one is on Tuesday at the Ripley Huron Community Centre, others follow this week on Wednesday at Victoria Jubilee Hall in Walkerton, and Thursday at the Colonial Motel in Port Elgin.

The open houses continue on November 9th at the fire hall in Chesley, Tuesday November 10th at the Harry Lumley Bayshore Community Centre in Owen Sound, and the final one is on Thursday November 12th at the Wiarton and District Community Centre.

Nuclear Waste Management Organization Media Relations Manager Marie Wilson says they want to make sure they maintain community support for the project.

She says open houses allow them to gauge if opinion has changed, and new people always show up at open houses who haven't been at previous ones.

Wilson says low level radioactive waste includes items used for cleanup and maintenance in generating stations, and intermediate level items include things used to keep plant water systems clean.

She stresses that no "spent fuel" from reactors will be put in the DGR.

Wilson said once the Deep Geologic Repository is constructed, all of the waste currently stored above ground at the Bruce site's Western Waste Management Facility will be sent underground.

baysh re br adcasting
C O R P O R A T I O N

Tuesday, November 3, 2009

Little interest in DGR meeting

Kincardine
by **James Morgan**

The first in a series of open houses on the proposed Deep Geologic Repository (DGR) at the Bruce nuclear station near Tiverton is in the books.

Only 17 people attended the meeting last night at the Davidson Centre in Kincardine.

But Marie Wilson -- a spokesperson for Nuclear Waste Management Organization (NWMO) -- says that is typicel.

The DGR will be a 680 metre deep vault where low and intermediate level radioactive waste from Onterio's nuclear power plants will be stored underground.

No used fuel will be kept in the facility.

The Project Officer for the Canadian Nuclear Safety Commission was on hand.

Kay Klassen says a Joint Review Panel will make a decision on the Environmental Impact Statement for the development.

She says if the federal government accepts the report from that panel, then a decision will be made on whether or not to grant a licence for the facility.

Paul Gierszewski of the NWMO is involved with the safety analysis for the project.

He says they look at potential impacts on people, the environment, and after the facility is closed, and possible scenarios.

The analysis is done in order to show regulators what sort of safety measures will be taken.

Kincardine Councillor Gordon Campbell was at the open house.

Campbell says he personally doesn't have a problem with the DGR, but thinks the public needs to be kept informed about the planning process.

A decision on going ahead with the DGR is expected in two years.

Another DGR open house takes place today from 4 PM to 8 PM at the Huron Community Centre in Ripley

One is planned for Wednesday in Walkerton, and Thursday in Port Elgin.

The open houses continue next week on Monday in Chesley, Tuesday in Owen Sound, and Wiarton on Thursday.

More Talk About Nuclear Waste Storage

Tuesday, November 3, 2009 5:40 am

Another round of open houses for the Deep Geologic Repository Project.
That's the Ontario Power Generation's plan to dig down 2,230 feet one mile from Lake Huron near Bruce Power to store nuclear waste.
The Nuclear Waste Management Organization has been contracted by OPG to seek regulatory approval for the project.
OPG Public Affairs Manager Marie Wilson says everything to date shows the Bruce site is a good one for the project.

(Click arrow for audio or right click to download)

She adds used nuclear fuel will not be placed in the repository at the Bruce.

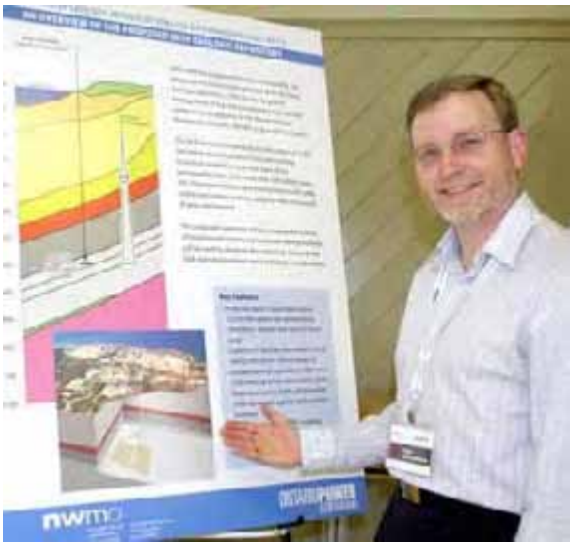
(continued)

New emplacement design unveiled at DGR open house

By Liz Dadson

Feature

To Comment on this article Click Here



Paul Gierszewski, director of repository safety, points to the new emplacement design in OPG's proposed DGR

Plans have changed for emplacement of the low-level and intermediate-level waste in Ontario Power Generation (OPG)'s proposed Deep Geologic Repository (DGR) at the Bruce Nuclear site in Kincardine.

Unveiled at an open house Monday night (Nov. 2) at the Davidson Centre in Kincardine, the layout of the emplacement rooms has changed to parallel panels in a rectangular shape, enhancing the stability of the rooms, says Marie Wilson, media relations manager for the Nuclear Waste Management Organization (NWMO) which is facilitating the regulatory and approvals process for this project.

Originally, the emplacement rooms were going to run in a diagonal pattern off a central location. "This is all part of the design process," says Wilson. "The new emplacement design is more efficient and effective."

As a handful of people stopped in at the open house, Wilson says the basic information about the DGR has not changed: the facility will hold 160,000 cubic metres of low-level and intermediate-level nuclear waste, 680 metres

Wilson says the four vertical boreholes have been drilled, allowing study of the rock at great depths. DGR-5, the first inclined borehole, has been completed and will help scientists discover if there are any fractures or faults in the rock that will house the DGR. The second inclined borehole (DGR 6), is expected to be finished early next year.

"We're now finalizing the engineering and design, working on the safety assessment, and completing some field work, such as the deer count," Wilson says.

This is the third round of open houses about the project, the last one was about a year ago, and another round will likely be held next year. Wilson says it's important to keep the public informed. "We have people coming in and asking questions," she says. "For some of them it's a new project. This is all in support of the Environmental Assessment process; we expect to be in public hearings by 2012."

Once the approvals process is completed, construction takes about five years. Wilson says, once approved, the DGR would be accepting low-level and intermediate-level waste by 2018.

An open house was also held in Ripley Tuesday night (Nov. 3), followed by open houses at Victoria Jubilee Hall in Walkerton on Wednesday (Nov. 4), and at the Colonial Motel in Port Elgin on Thursday (Nov. 5). Next week, open houses are scheduled at the Chesley Fire Hall on Monday, Nov. 9, the Bayshore Community Centre in Owen Sound on Tuesday, Nov. 10, and the Wiarton and District Community Centre on Thursday, Nov. 12. The events run 4-8 p.m.

(2,230 feet) below the surface.

Wednesday, November 04, 2009

DGR project making headway
Posted By ELYSE DEWAR, Kincardine News Staff
Kincardine News, page 33
November 10, 2009

Low to intermediate nuclear waste could be stored in Bruce County by 2017/18.

Last week, representatives from Ontario Power Generation (OPG) Deep Geologic Repository (DGR) project set up shop in local comments towns offering the public a chance to ask questions and become more informed on the DGR's progress.

On Tuesday, Nuclear Waste Management Organization (NWMO) staff managing the project were in Ripley with diagrams and displays to help citizens understand the project.

NWMO's Marie Wilson said the project is currently working on the environmental assessment (EA) process and a key part of that is providing the opportunity for public input and becoming informed on the project.

"We want to make sure people get the latest information we have and the DGR's process," said Wilson.

If NWMO obtains EA support, it can move forward with the DGR. In 2008, two deep bore test holes were drilled and three more were recently finished. They hope to have a sixth drilled by 2010.

Results from geoscience, engineering and design, safety assessment, environmental field work and communications will be reflected in the Environmental Impact Statement (EIS) which will be submitted to the Joint Review Panel (JRP), along with the Preliminary Safety Report.

Wilson said the public will then have a chance to review the EIS.

"There will be an opportunity for public comments and several public hearings in 2012," she said. "Some of those hearings will be in Kincardine."

By 2012, feedback from the public will be collected and the JRP will make a recommendation to the Minister of Environment on the suitability of the EIS.

Then, the minister will take it to the Cabinet for the final decision. EIS must be accepted before a site preparation/construction licence can be issued.

If approved, construction of the DGR could take up to five years.

"Then we can start putting low to intermediate waste down there," said Wilson.

Low level waste includes several items such as mop heads, cloths, paper towels, temporary floor coverings, protective clothing and hardware items. These, among many more, can be safely handled using normal industrial practices and equipment without any special radiation protection.

Low level waste makes up about 95 per cent of the total non-fuel waste volume received at OPG's Western Waste Management Facility (WWMF).

About 3,000 cubic metres of low level waste is stored annually at the WWMF. The majority of low level waste is incinerated or compacted for volume reduction before it's placed in concrete warehouse-like buildings for interim management.

Intermediate level waste consists primarily of used reactor core components, resins and filters used to keep reactor water systems clean and reactor retube parts such as pressure tubes.

This level of waste requires shielding to protect workers during handling and makes up about five per cent of all non-fuel waste received at the Western Waste Management Facility with about 200 cubic meters each year. It is stored in steel-lined concrete containers set into the ground.

The DGR is designed for the long-term management of low and intermediate nuclear waste on lands adjacent to WWMF in Kincardine.

The DGR would be located about 680 metres or 2,230 feet below ground surface in low permeability limestone, beneath a very thick layer of low permeability shale, both more than 450 million years old. To give an idea of how deep it will be, the CN Tower is 553 metres or 1,800 feet tall.

These sedimentary bedrock formations will safely isolate and contain nuclear waste for many thousands of years, Wilson said.

The repository will be composed of a series of emplacement rooms. Conventional mining methods will be used to construct the repository and access to the DGR and emplacement rooms will be the vertical shafts.

Bruce A restart a year behind schedule

by Kristen Shane

Bruce Power is set to restart Units 1 and 2 of the Bruce A nuclear generating station a year behind schedule and at a cost of about 24 per cent, or $650 million, more than it expected, company officials said last week.

When they were mapping out the project in the mid 2000s, they estimated it would cost $2.75 billion. They crossed that figure out last April and boosted it to $3.4 billion, as it still stands.

But at that time, CEO Duncan Hawthorne said he was still confident the project would be finished around the start of 2010, as the company had originally planned. Now, it expects to restart Unit 2 in mid 2011 and Unit 1 about four months later.

Bruce Power and one of its investors revealed the extent of the delay when they released their third-quarter earnings results last week, which covers a period from July to the end of September.

When the company cracked open Unit 2, the first to be refurbished, it was stumped to find red oxide dust that had to be inspected and cleaned. That caused some delay, said spokesperson Steve Cannon on Friday.

Bruce Power lost more time because it had to use newly invented processes and machinery to pull out parts of the old reactor.

"Work on Unit 1 is going a lot quicker because a lot of the tools and processes have been refined," said Cannon.

The project is about three-quarters finished and $3.1 billion has been spent. Company officials can breathe a sigh of relief now that most of the high-tech, high-risk activities are done and they can forge ahead on the rest, which includes more regular power plant construction activities such as electrical and valve work.

When the units are reconnected, they should be able to make a total of 1,500 megawatts of electricity, said Cannon.

In the mean time, most of Bruce Power's investors (one investor has opted out of funding the Bruce A restart) including the western Canadian energy company TransCanada Corp., are shouldering the cost overruns.

They are also taking a hit because Bruce Power produced less electricity in the summer's end. It sent 8.42 terawatt hours worth of electricity to the Ontario grid, down from 9.6 terawatt hours during the same period last year.

One terawatt hour is equal to one million megawatt hours. One megawatt hour is enough electricity to power 10,000 average light bulbs for an hour.

The production slump is partly because Bruce A Units 3 and 4 were shut down since early September for planned inspection and maintenance work. They were set to be brought back online "very soon" Cannon said Friday.

Also, Bruce B could have produced almost 11 per cent more electricity, but a provincial electricity supply regulator asked the company to shut units down temporarily at some points during summer because it didn't want to flood the provincial supply with more power than was needed.

The company's fourth quarter results should be available early next year.

People knowledgeable about DGR, says official

The low turnout at open houses in Kincardine and Ripley last week was a positive sign, says a Nuclear Waste Management Organization (NWMO) official.

Spokesperson Marie Wilson said Wednesday that 17 people turned out at the deep geological repository (DGR) open house in Kincardine Monday and five at the one in Ripley Tuesday.

The low turnout is a sign that most people are knowledgeable and comfortable with the project, said Wilson.

The open houses last week are part of the regulatory process. NWMO wants lots of venues for people to get information on the project, said Wilson.

Although turnout was low, officials had lots of interesting conversations, she said. Open houses allow people to get more detailed information.

NWMO is under contract with Ontario Power Generation (OPG) to manage the DGR project through the regulatory process. OPG will own and operate the DGR which will store low- and intermediate-level radioactive waste about 680 metres underground at the Western Waste Management Centre at Bruce Nuclear Power Development.

Paul Gierszewski, director of repository safety, explains a point to Bob Percival at the Nuclear Waste Management Organization's open house at the Davidson Centre on Monday evening of last week. (Eric Howald photo)

It is expected that a public hearing in 2012 will give OPG permission to proceed with the project. Once approval is given, construction would start and OPG would likely apply for an operating licence in 2017.

Paul Gierszewski, director of repository safety with NWMO, said at Monday's meeting that the test boreholes at the site have shown that the bedrock at the 680 foot level is much harder than expected. Building the repository will be like hard rock mining. The DGR will be far below the level of Lake Huron.

Once in operation, the DGR would operate for 35 to 40 years and have a workforce of 30.

By the time the project is finished, said Wilson, $1 billion will have been spent.

Health Unit says lessons learned from real-life test

BY PAT HALPIN
WDU Correspondent

Health authorities got a test of their pandemic plan thanks to the H1N1 outbreak.

The real life test was helpful, said Grey Bruce Medical Officer of Health Dr Hazel Lynn, but it also revealed glitches.

"This has been awesome practice. We're way, way better now having done some large clinics and realized the logistics of trying to get vaccine to outlying areas, so we're way better prepared now," Dr Lynn told Bruce County council last week.

Municipalities and health authorities have spent countless time and money on pandemic planning.

Still, health officials trying to follow a provincially set priority list were frustrated by slow release of the H1N1 vaccine and high demand even from low-risk groups.

At the same time mixed messages drove up demand for scarce supplies, while health unit staff struggled with practicalities of delivering vaccine and managing clinics.

"Part of the problem is we didn't have any tools until we got the vaccine. We needed it a month earlier if we were going to make a real difference here," Dr Lynn said.

"I'm really, really grateful this has not been a very virulent bug."

The peak of H1N1 cases in Grey and Bruce passed late last week, Dr Lynn told Bruce County councillors.

There will still be cases as the H1N1 outbreak winds down, but she said immunization could "blunt the impact" among susceptible people in the final days of the wave.

Enforcing the provincially- mandated priority list for flu shots has been a challenge, Dr Lynn admitted.

People with underlying health issues are at the top of the list, though fear and mixed messages have others anxious to join the line.

"We have complained a little to our Chief (Medical Officer) that don't tell everybody come get (a shot) if we don't have it. I don't have enough vaccine to do everybody, even if I would like to," she said.

Patients at risk can also get flu shots from their family doctor, Dr Lynn said.

Keeping the public informed

Don Jones and Diane Barker, right, of Nuclear Waste Management Ontario, discuss the proposed deep geologic repository project with Ruth Fischer, left, and Susan Rankin, at an Open House held at the Victoria Jubilee Hall last Wednesday night. The presentation updated residents on the progress of the Environmental Assessment, which is about two-thirds done, according to Kevin Orr of NWMO. A decision on the proposal to store low and intermediate level radioactive waste in a deep geologic repository at Ontario Power Generation is expected in 2012.

John McPhee photo

Appendix C

Open House Handouts

DGR
OPG's Deep Geologic Repository for Low & Intermediate Level Waste

Keeping You Informed About the Deep Geologic Repository October 2009

NWMO moves forward with OPG's DGR

Amphibians flourish in healthy habitats at Bruce nuclear site

It's about 9:30 p.m. on a balmy May evening at the Bruce nuclear site and Richard Baldwin, a biologist with Golder Associates, is getting ready to listen to what will be one of nature's natural symphonies in one of the many marsh habitats that dot the Bruce nuclear site.

The peeping begins, slowly at first, as the last remnants of the day's sun slips below the horizon, leaving darkness in place of the soft, purple hues that only moments ago gently brushed the water, the pine trees and the outcropping of rugged rocks. The stillness and solitude of the landscape, worthy of a Group of Seven painting, are broken by the shrill sounds of a Spring Peeper, and then another joins in, and yet another and another, and intermixed among the chorus of Spring Peepers, is the distinct baritone of a Grey Treefrog, who at this time of year, is expanding his lungs to the fullest to call a potential mate.

Rick listens carefully, clipboard in hand, translating the auditory range of frog sounds into meaningful data, which will help establish the baseline environmental conditions at the site for Ontario Power Generation's (OPG) proposed Deep Geologic

Biologist Rick Baldwin carefully listens as he conducts a frog count at the Bruce nuclear site in support of the EA process for OPG's DGR L&ILW.

(Continued on page 3)

NWMO moves forward with community initiatives

NWMO supports Chesley medical clinic

The Nuclear Waste Management Organization (NWMO) is managing the proposed Deep Geologic Repository for Low and Intermediate Level Waste project through the regulatory approvals process on behalf of Ontario Power Generation (OPG).

And as a new company to the area, NWMO is making a commitment to the development of the Bruce community through its DGR Community Partnership Program.

On the environmental front, NWMO continues to support local green initiatives such as the Green Cone Composting Program in the Town of South Bruce Peninsula. As it did in Brockton, NWMO is providing funding for promotional and educational materials about the program to ensure residents are aware that they can purchase green cones from the municipality at cost.

NWMO is pleased to provide financial support to the expansion of the Chesley Medial Clinic, which provides medical services to about 6,000 residents from the Municipalities of Arran-Elderslie and surrounding areas. It's hoped that a newly expanded and updated clinic – it will double in size going to 6200 sq. ft – will allow Arran-Elderslie to move forward with its desire to accommodate a Family Health Team of both doctors and a variety of health care professionals to administer to the health needs of its citizens, some of whom are orphan patients without current access to a doctor.

Saugeen Shores will soon be the site of a Regional Integrated Accessible Playground. This unique initiative will provide about 2500 children in Grey Bruce with access to a play area specifically designed to break down the barriers, which normally prevent children or parents with limitations from fully participating in most play spaces. Construction of this project, proudly supported by NWMO, is expected to begin in spring 2010.

For more information about the DGR Community Partnership Program, please contact Kevin Orr at 519-368-1644 or email korr@nwmo.ca.

NWMO is pleased to support the expansion of the Chesley Medical Clinic which is expected to help establish a Family Health Team for area residents. Fundraising committee members David Spencer and Clarke Birchard (respectively flank) Kevin Orr from NWMO at the cheque presentation.

OPG's DGR L&ILW hits the silver screen

The Nuclear Waste Management Organization (NWMO) joined hands with two community groups this past summer through the sponsorship of two outdoor viewings of family feature films at two separate events. A short video, which provides an overview of the proposed Deep Geologic Repository for Low and Intermediate Level Waste (DGR L&ILW) project, was also featured on the 25 ft. screen as a prelude to the showing of the films. It should be noted the NWMO is managing the DGR L&ILW, through the regulatory approvals process, on behalf of Ontario Power Generation (OPG).

NWMO sponsored the showing of *Kung Fu Panda* in Kincardine as part of their Canada Day festivities on July 2 and then on September 12, NWMO partnered with the Bruce County Museum and Cultural Centre to present *E.T. – the Extraterrestrial* on the giant outdoor stage. The museum, in conjunction with the Bruce County Astronomical Society, hosted a family astronomy event at the Outdoor Education Centre near Wiarton, so the space-related movie was in keeping with the overall space theme, and well received by the crowd.

Those in attendance thoroughly enjoyed the outdoor films, and NWMO will definitely be considering similar events at different venues as part of their planning for next year.

Bruce County museum and Cultural Centre volunteers James and Sandy Seaton learn more about OPG's DGR L&ILW from NWMO's Diane Barker before the outdoor showing of E.T. sponsored by NWMO.

NWMO moves forward with baseline field studies for OPG's DGR L&ILW

Left: Field biologist Tony Calverly conducts a breeding bird survey at the Bruce site in late May. A total of 60 species were identified during surveys conducted from May 29-31 and July 2-4. 40 of these were exhibiting breeding behaviour in appropriate habitats. No species at risk were identified during these surveys although two black-crowned night herons were observed flying over the site. These birds are listed as a vulnerable species in the province of Ontario by the Natural Heritage Information Centre.

Above: Susanne Carrelos, an environmental technician, conducts a round of water quality sampling from surface water at a number of locations at the Bruce site as part of the baseline field studies.

(Continued from page **1**)

Repository for Low and Intermediate Level Waste (DGR L&ILW).

The amphibian count is part of an extensive series of baseline field studies at the Bruce site, being conducted by Golder Associates, who is under contract to the Nuclear Waste Management Organization (NWMO). These studies, along with many others, are being done in support of a lengthy Environmental Assessment process for the DGR L&ILW and provide the basis for an examination of potential environmental effects. This information, along with results of public consultation, will be documented and submitted to the Joint Review Panel who will determine whether the project will ultimately move forward to construction.

"You need to establish a baseline set of data for the site environment so you have a starting point to gauge the potential effects of the project," Rick said. "If you start off with an abundant calling of frogs, and then it starts to decrease, you know something is wrong."

Rick notes that frogs or amphibians in general serve as environmental bellwethers for the degradation of their habitats.

"Amphibians breathe through their skins, which are very thin, so they are extremely sensitive to any changes in the environment, he said, adding that they will be the first to be affected by degradation such as toxins.

During his frog counts at the Bruce site, Rick has observed an abundance of calling at various levels over the roughly dozen designated spots he has studied. In terms of the protocol for counting frogs, it's determined by three levels. Level one is designated as an area where you can distinctly hear and discern the different species, while in level two, the callings are so numerous that the species start to overlap making it difficult to segregate the different sounds. In level three, there are so many callings that chaos rules and it's impossible to discern any of the species. The bottom line, Rick said, is that the Bruce site hosts at least a dozen healthy habitats where frogs (Spring Peepers, Grey Treefrogs, American Toads, and Green Frogs) flourish and make music.

Other baseline field studies being conducted as part of the investigations for the DGR L&ILW include: light assessment, water quality sampling, sediment sampling, stream geomorphic studies (physical features of earth's surface), stream aquatic habitat study, and surveys of Burrowing Crayfish, Vegetation, Basking Turtles, Breeding Birds, Meadow Voles and Deer population.

NWMO moves forward with Engineering/Design

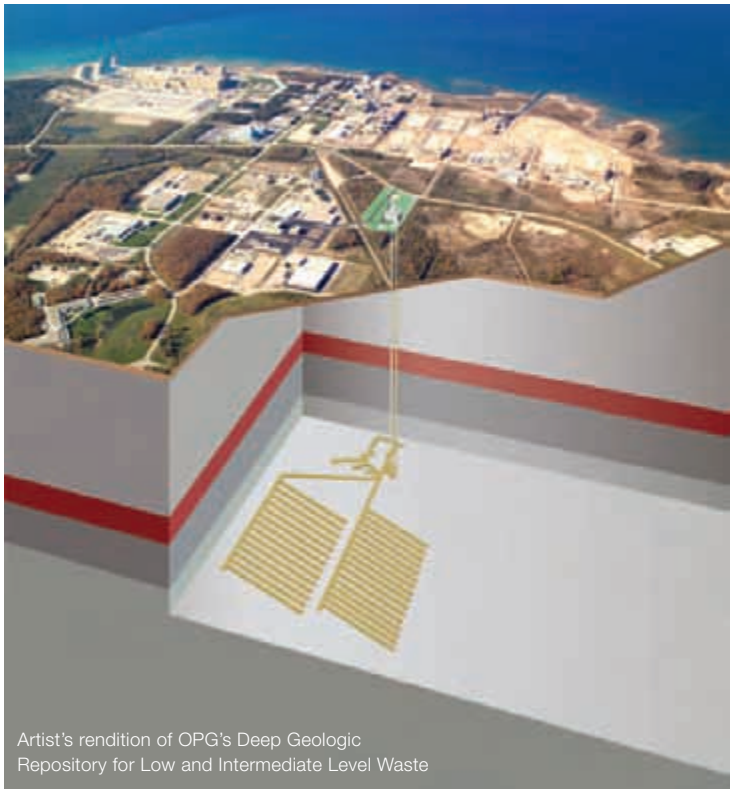
OPG's DGR L&ILW has a new look

The design for Ontario Power Generation's (OPG) proposed Deep Geologic Repository for Low and Intermediate Level Waste (DGR L&ILW) facility has changed. The new underground layout is better suited for the expected deep rock conditions at the Bruce site.

The layout of the emplacement or waste storage rooms has changed to parallel panels of rooms in a rectangular shape. This room orientation will enhance the stability of the rooms.

The facility for low and intermediate level nuclear waste will be constructed at a depth of 680 metres in low permeability limestone bedrock overlain by a 200 metre thick cap of low permeability shale and it will accommodate about 160,000 cubic metres of low and intermediate level waste.

The change in lay-out is indicative of the progress that is being made in engineering/design, which along with the ongoing geoscience investigations, safety assessment, environmental field studies and community engagement work will support the environmental assessment process for OPG's DGR L&ILW.



Artist's rendition of OPG's Deep Geologic Repository for Low and Intermediate Level Waste

You are invited to an open house featuring OPG's DGR L&ILW

The Nuclear Waste Management Organization, on behalf of Ontario Power Generation (OPG), is hosting a series of seven open houses to review plans for the proposed Deep Geologic Repository for Low and Intermediate Level Waste (DGR L&ILW) project.

This third round of open houses, in three years, will focus on the Safety Assessment results to date. This discipline is examining both the radiological and conventional safety of the DGR L&ILW during its 40–50 year operating period, malfunctions and "what if accident scenarios" as well as how the facility will perform well into the future as it encounters phenomenon such as evolution and glaciations.

Updated information is also available from the geoscientific investigations and engineering and design.

As always, staff will be available to answer your questions, hear your views and provide any additional information that is required.

The open houses are being held as part of the environmental assessment, which encourages public participation in the process.

Open houses will be held from 4 p.m. to 8 p.m. at the following locations:

Kincardine	
November 2nd	Kincardine Davidson Centre
Ripley	
November 3rd	Ripley Huron Community Centre
Walkerton	
November 4th	Victoria Jubilee Hall
Saugeen Shores	
November 5th	Colonial Motel
Chesley	
November 9th	Chesley Fire Hall
Owen Sound	
November 10th	Bayshore Community Centre
Wiarton	
November 12th	Wiarton & District Community Centre

Opportunities for engagement in Aboriginal Communities will be welcomed at their request.

For more information, please contact Marie Wilson at 519-368-1639 or visit **www.nwmo.ca/dgr**.

nwmo
NUCLEAR WASTE MANAGEMENT ORGANIZATION
SOCIÉTÉ DE GESTION DES DÉCHETS NUCLÉAIRES

For more information on the DGR, please visit: **www.nwmo.ca/dgr**

Editor: Marie Wilson
Phone: (519) 368-1639
email: mwilson@nwmo.ca

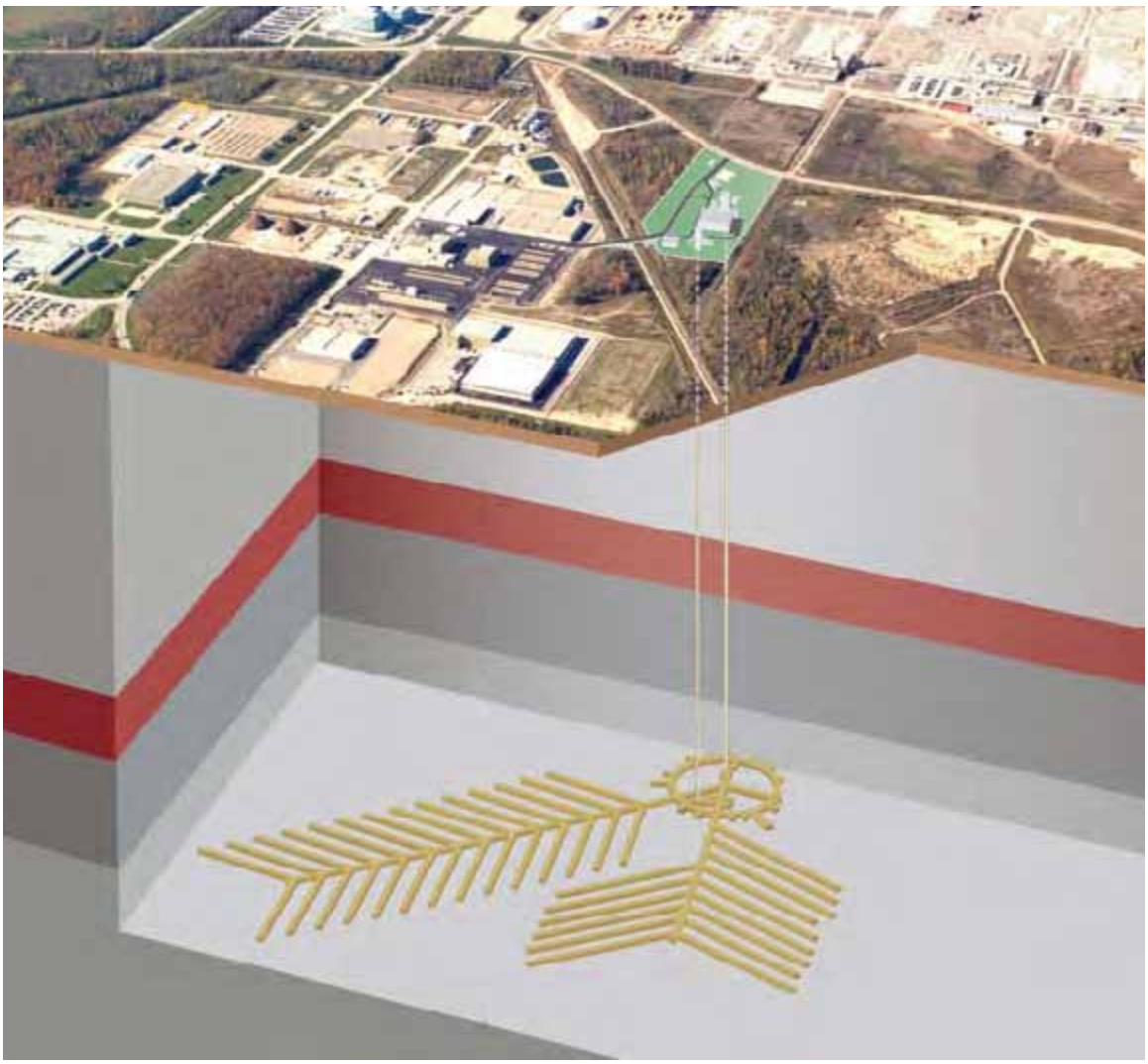
Mailing Address:
Nuclear Waste Management Organization
P.O. Box 7000 B21
Tiverton, Ontario N0G 2T0

Printed on 100% recycled stock

DEEP GEOLOGIC

REPOSITORY

FOR OPG's LOW & INTERMEDIATE LEVEL WASTE



KEEPING YOU INFORMED

nwmo

NUCLEAR WASTE MANAGEMENT ORGANIZATION

SOCIÉTÉ DE GESTION DES DÉCHETS NUCLÉAIRES

TABLE OF CONTENTS

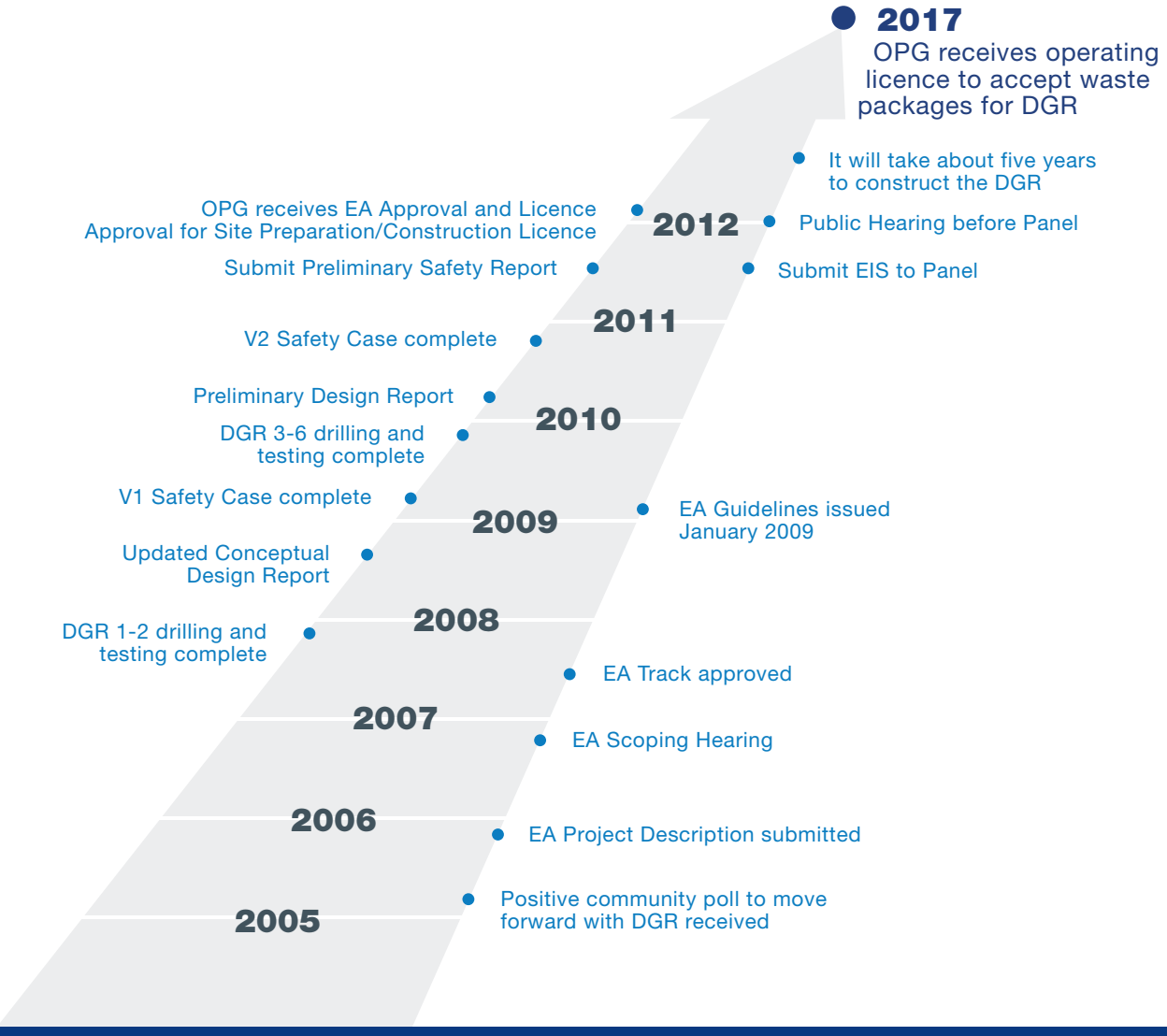
nwmo
NUCLEAR WASTE MANAGEMENT ORGANIZATION
SOCIÉTÉ DE GESTION DES DÉCHETS NUCLÉAIRES

Dear Stakeholder:

The Nuclear Waste Management Organization (NWMO) is pleased to provide you with this information on the proposed Deep Geologic Repository (DGR) project – a long-term management facility for low and intermediate level nuclear waste only. The NWMO is seeking regulatory and licensing approval for the project on behalf of Ontario Power Generation (OPG) who is the owner and licensee of the DGR. NWMO and OPG believe the DGR is a safe and environmentally responsible approach to managing the existing and future low and intermediate level nuclear waste from OPG's 20 reactors.

A formal environmental assessment and licensing process began for the DGR in 2005 and is expected to take six to eight years. A public hearing before a joint review panel will be held around 2012. Community consultation will provide many opportunities for members of the public to be informed and express their views on the proposal. This booklet is designed to provide you with an overview of the proposed DGR. For more information about the DGR, please visit **www.nwmo.ca/dgr**, call 519-368-1639 or email **mwilson@nwmo.ca**.

Project and Regulatory Process



For more information about the DGR regulatory process visit **www.nuclearsafety.gc.ca or www.ceaa-acee.gc.ca**

DGR Project Moving Through EA/Licencing Process

2005	Regulatory process to receive a licence to construct a DGR begins with the submission of the DGR Project Description to the Canadian Nuclear Safety Commission (CNSC) who must approve the licence
2007	DGR project was referred to a Joint Review Panel Environmental Assessment (EA) under the Canadian Environmental Assessment Act in June by the federal Environment Minister. The Joint Review Panel process allows a panel of three to consider both the Environmental Impact Statement (EIS) and the application for site preparation/construction licence
2008	Environment Minister and CNSC jointly issued draft guidelines for EIS and Joint Review Panel Agreement in April for public review. Participant funding awarded to six parties to assist with participation in public review
2009	Final guidelines were issued in January
2009+	Work continues to verify the Bruce site as a suitable location for the DGR and to analyze any potential effects on the environment from the DGR
2011	Results from geoscience, engineering and design, safety assessment, environmental field work and communications will be reflected in the EIS to be submitted to the Joint Review Panel along with the Preliminary Safety Report
	EIS will be available for public review
2012	A public hearing to hear feedback from individuals and groups will be held. The panel will make a recommendation to the Minister of Environment on the suitability of the EIS. The minister then takes it to Cabinet for the final decision. EIS must be accepted before a site preparation/construction licence can be issued

How will the project be funded?

- Construction and operation of the DGR is estimated at $1 billion with about $600 million of that slated for construction
- Under the Ontario Nuclear Funds Agreement, a segregated fund has been established for the long-term management of low and intermediate level nuclear waste from OPG reactors and the decommissioning of nuclear power plants. The DGR is already fully funded

Western Waste Management Facility (WWMF)

- OPG's WWMF, located in the Municipality of Kincardine, has safely managed low and intermediate level nuclear waste since 1974 and can continue in this role for many decades
- The WWMF manages all of the low and intermediate level nuclear waste from the Bruce, Pickering and Darlington generating stations. It also manages the low and intermediate level nuclear waste from the Douglas Point Generating Station, located at the Bruce site
- The WWMF manages high level nuclear waste from Bruce Power, while Darlington and Pickering have facilities for managing their own high level nuclear waste
- The DGR will provide safe long-term management for all of the low and intermediate level nuclear waste currently managed at the WWMF including waste from the future operation of OPG's existing reactors

Western Waste Management Facility

1: **10 Low Level Storage Buildings**
2: **Quadricells**
3: **Waste Volume Reduction Building**
4: **Transportation Package Maintenance Building**
5: **Used Fuel Dry Storage Facility**
6: **Refurbishment Waste Storage Buildings**
7: **In-Ground Storage Containers**
8: **Future Low Level Storage Buildings 11 & 12**

What is Low Level Nuclear Waste?

Low level waste is received at the WWMF

- Low level nuclear waste consists of common industrial items that have become contaminated with low levels of radioactivity during routine clean-up and maintenance at the nuclear generating stations
- It includes mops, rags, paper towels, temporary floor coverings, floor sweepings, protective clothing and hardware items such as tools
- It consists of paper, plastics, metal, rubber, cotton and other miscellaneous materials
- Low level nuclear waste can be safely handled using normal industrial practices and equipment without any special radiation protection

What is Intermediate Level Nuclear Waste?

Intermediate level nuclear waste is inserted into in-ground storage containers at the WWMF

- Intermediate level nuclear waste requires shielding to protect workers during handling
- Intermediate level nuclear waste typically includes ion exchange resins, filters and irradiated core components associated with refurbishment waste
- Approximately 290 m^3 of intermediate level nuclear waste is received each year at the WWMF
- Approximately five per cent of all waste (excluding used fuel) received at the WWMF is intermediate level nuclear waste

What is High Level Nuclear Waste?

Used fuel dry storage containers

- High level nuclear waste consists of fuel bundles that are used in the reactors to produce energy for electricity
- Fuel bundles spend a minimum of 10 years in large pool-like structures filled with water called fuel bays before they are placed in robust dry storage containers made of steel and concrete that provide shielding
- **Used Fuel will not be placed in the DGR.** It is stored on an interim basis at the site where it is generated
- The Nuclear Waste Management Organization has the responsibility for implementing Adaptive Phased Management – a long-term management plan that is intended to, with collaboration, continuous learning and adaptability, eventually lead to the construction of a geologic repository for all of Canada's used fuel

For more information about the NWMO and Adaptive Phased Management, please visit **www.nwmo.ca**

What is Refurbishment Nuclear Waste?

A steam generator is transported to the WWMF for interim management

- Refurbishment nuclear waste consists of low and intermediate nuclear waste generated from the refurbishment of reactors
- Intermediate refurbishment nuclear waste consists of irradiated core components such as pressure tubes, calandria tubes and end fittings that are safely managed in shielded containers inside a concrete refurbishment waste building
- Low level refurbishment nuclear waste consists of steam generators that are safely managed in a concrete refurbishment waste building

Transportation of Nuclear Waste

- Low and intermediate nuclear waste has been transported from the Pickering and Darlington generating stations to the WWMF for over 35 years
- Transportation of nuclear waste is regulated by the Canadian Nuclear Safety Commission (CNSC)
- No release of nuclear materials has ever occurred during transportation of the waste
- Training about the transportation of nuclear materials is provided to First Responders all along the transportation routes
- OPG has a Transport Canada emergency response plan in place with highly trained responders

A Community Partnership

In 2002, the Municipality of Kincardine and Ontario Power Generation signed a Memorandum of Understanding (MOU). The MOU set out terms to assess the feasibility of the long-term management of low and intermediate level nuclear waste at the Western Waste Management Facility located within the Bruce site.

- Under the MOU, Golder Associates conducted an Independent Assessment Study, which looked at the feasibility of various long-term management options for low and intermediate level nuclear waste at the Bruce site. It also included a preliminary safety assessment and took into account information from a study based on existing geological, groundwater and geotechnical information related to the Bruce site
- Three options were deemed to be technically feasible, safe and without significant social, economic or environmental impacts: enhanced storage and processing, above ground concrete vaults and deep geologic repository
- The Independent Assessment Study compared the options and included consultation with the local community and stakeholders
- In 2004, Council for the Municipality of Kincardine endorsed the DGR over all of the other options, by resolution, because of its greater safety margin
- In 2005, an independent polling of both permanent and seasonal residents was conducted in Kincardine which showed a majority of residents supported going forward with the DGR

Hosting Agreement

Key features:

- With the support of the community, OPG will obtain regulatory approvals to construct the Deep Geologic Repository for low and intermediate level nuclear waste

- Kincardine, Saugeen Shores, Huron-Kinloss, Arran-Elderslie and Brockton to receive $35 million (2004 dollars, inflation protected) paid over 30 years subject to achieving key milestones:
  > Environmental Assessment Guidelines
  > Environmental Assessment Approval
  > Construction Licence
  > Operating Licence

- The Municipalities will choose how to use the funds for the benefit of their communities

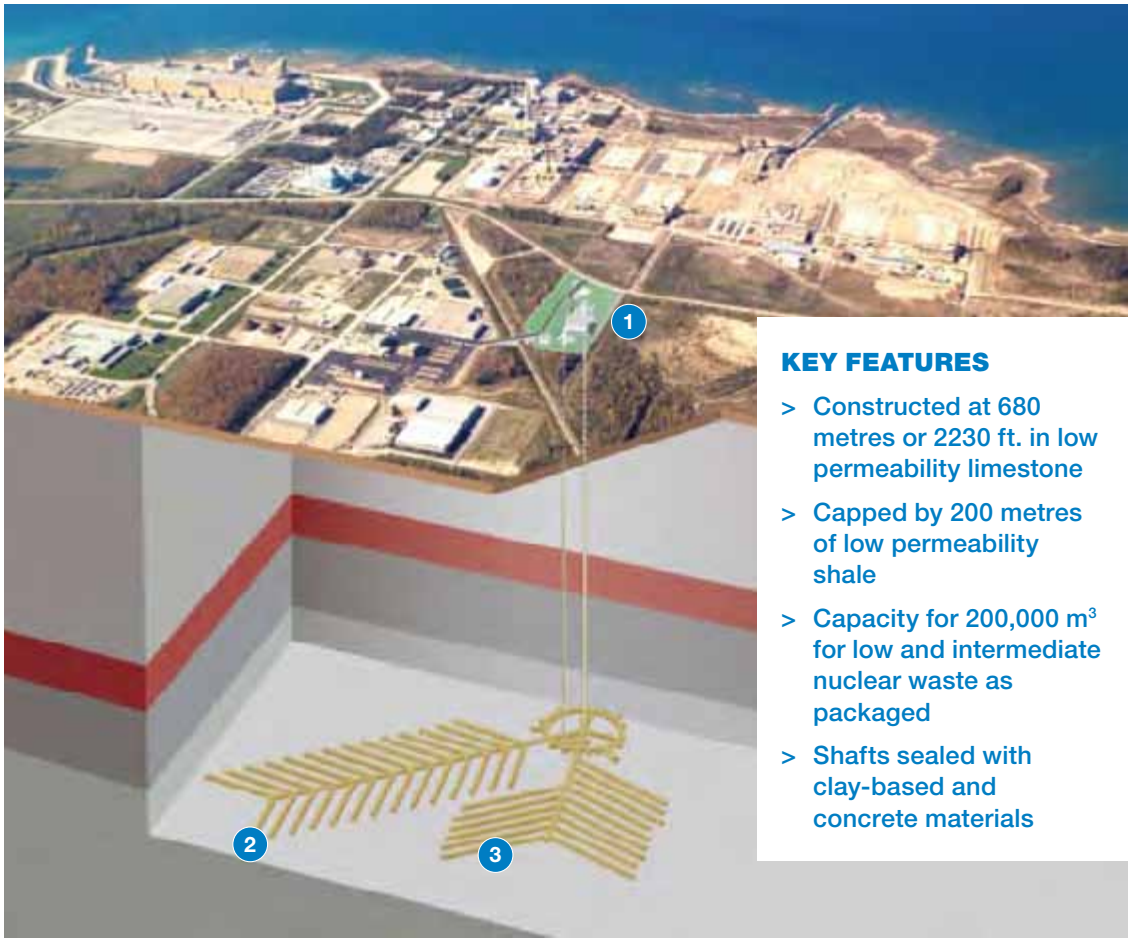
- Provision for 200,000 m^3, as packaged, of low and intermediate level nuclear waste produced until 2035 during reactor operations from OPG's 20 reactors, including refurbishment and decommissioning waste

- Provision to negotiate repository expansion for additional low and intermediate level nuclear waste for new build reactors in Ontario

- No used nuclear fuel will be placed in the Deep Geologic Repository

- Property Value Protection Plan

Proposed Deep Geologic Repository at OPG's WWMF



KEY FEATURES

- Constructed at 680 metres or 2230 ft. in low permeability limestone
- Capped by 200 metres of low permeability shale
- Capacity for 200,000 m^3 for low and intermediate nuclear waste as packaged
- Shafts sealed with clay-based and concrete materials

1: **DGR surface facilities**

2: **LLW emplacement room**

3: **Resin Liner Shields within ILW emplacement room**

DGR Conceptual Engineering Design

- Rock excavation will be primarily by roadheader
- The main shaft will provide personnel access and waste handling, and a second shaft will provide exhaust ventilation and an emergency escape route
- Excavated rock will be stored on-site
- Surface facilities will include a headframe building, and an adjoining building for waste package receipt and staging
- Construction will take about five years
- A 40-tonne hoist will move waste and personnel between the surface and repository levels
- Underground facilities, located in the ring tunnel, include waste receiving, a control room, equipment room, geoscience laboratory, refuge stations, cafeteria and showers
- Low and intermediate level nuclear waste will be managed in separate emplacement rooms. The rooms will be excavated in limestone and will have concrete floors
- Once filled, each room will be isolated by a wall, but not backfilled

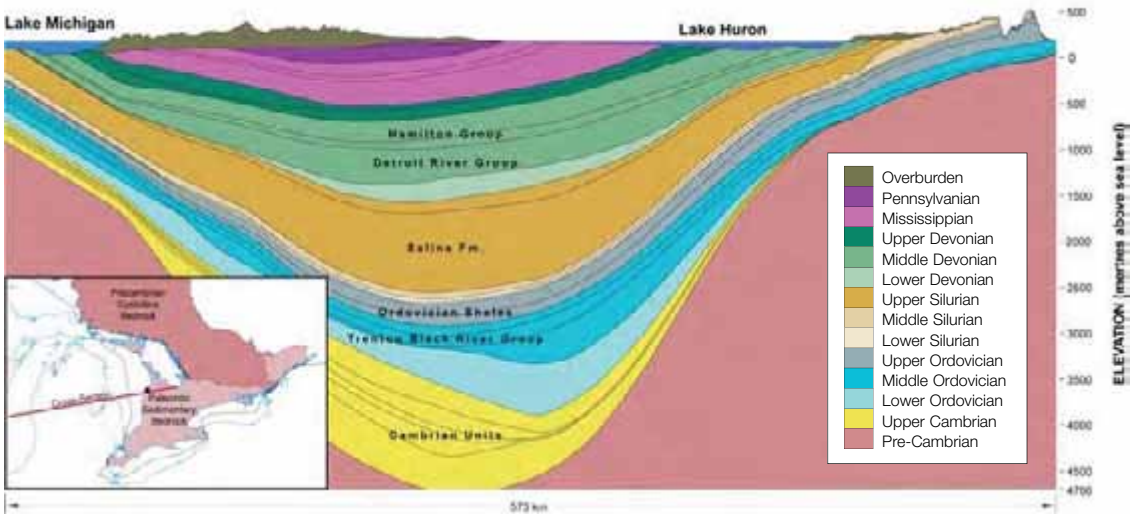
Roadheaders will be used to construct access tunnels and emplacement rooms

Geoscience Attributes

PREDICTABILITY

- Borehole coring indicates a consistent bedrock “column” beneath the Bruce site comprised of 34 horizontally-layered and laterally extensive bedrock formations of Cambrian to Devonian age (543–350 million years)

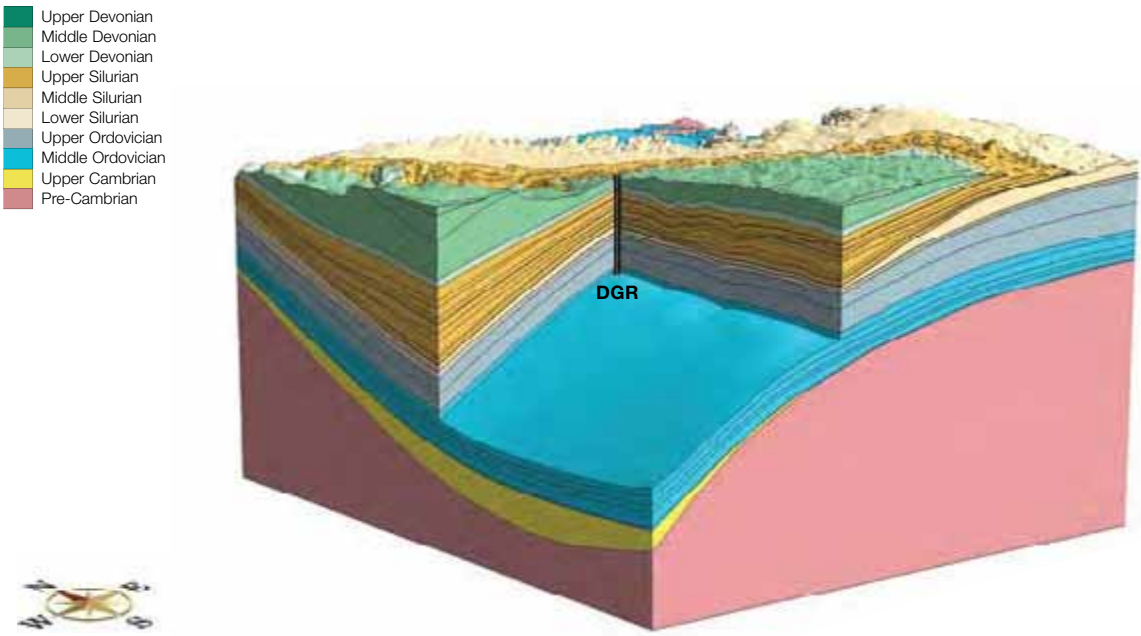
- Sedimentary bedrock layering, observed beneath the Bruce site, reflects the regional geologic knowledge that these layers extend laterally for great distances of up to hundreds of kilometres beyond the Bruce site



Geologic cross-section of Michigan Basin

MULTIPLE NATURAL BARRIERS

- The diagram below portrays the various geologic layers present at the Bruce site
- The DGR is surrounded by multiple layers of low permeability sedimentary rock. The horizon immediately above the repository is comprised of a 200-m layer of low permeability Ordovician age (450 Million years) shale located about 440 m below ground surface
- A sequence of shales, dolostones and evaporties, including the Silurian age (420 million years) Salina Formation (190 m thick) above the Ordovician shale, also possesses low permeabilties

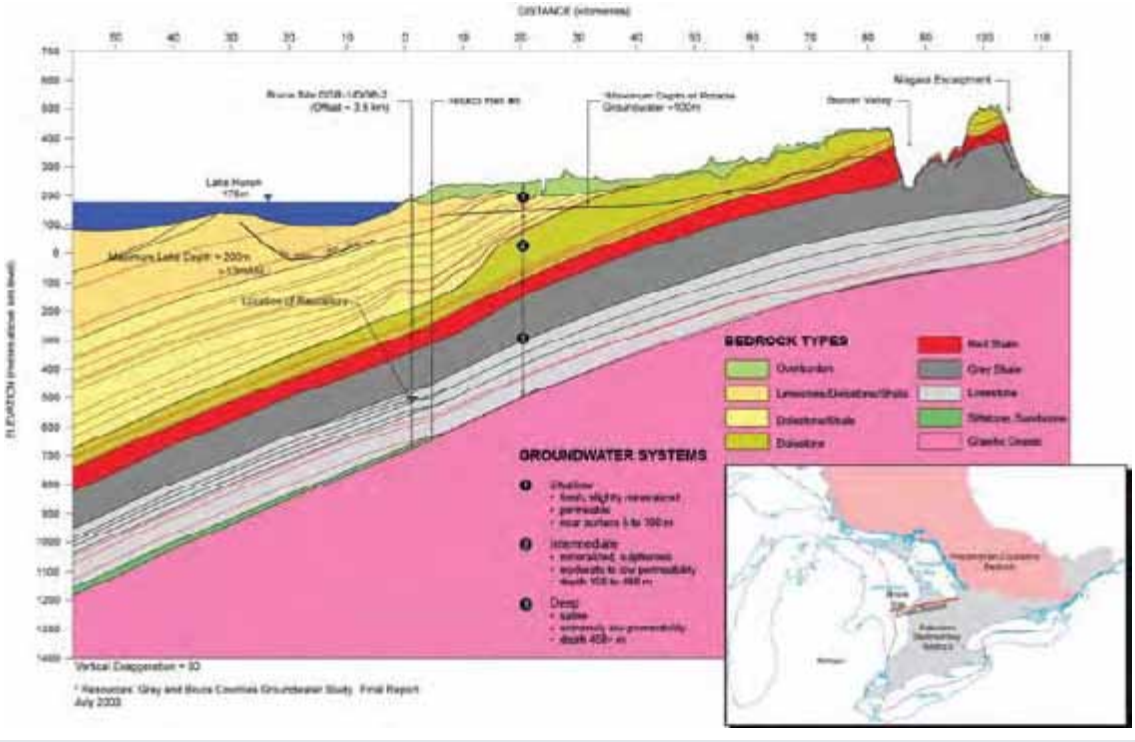


Regional study area 3-dimensional model of bedrock stratigraphy

Geoscience Attributes

NATURAL BARRIERS TO PROTECT GROUNDWATER AND SURFACE WATER

- Drinking water found in the upper 100 m is extremely well isolated from the DGR
- Water found at the repository depth has a salt content eight times that of seawater, an indication it has been trapped within the rock layers for millions of years, from the time when it was part of an ancient sea bed
- Pore water found at 680 m doesn't flow, but is sluggish and stagnant



DGR will protect Lake Huron

- The DGR will be located about one kilometre inland from Lake Huron
- The deepest point of Lake Huron at about 200 m (660 ft.) is well isolated from the DGR by over 400 m (1320 ft.) of rock layers

SEISMICALLY QUIET

Low level seismic monitor

- The Bruce region, located in the stable interior of the North American continent, is seismically comparable to the stable Canadian Shield. Historic records of seismic activity do not reveal events exceeding M5, within a radius of more than 150 km of the Bruce site, in the past 180 years

- A network of three low-level seismicity monitors was installed within a 50-km radius of the DGR site in 2007. Reports compiled by the Geological Survey of Canada from this network have not detected any seismic activity greater than M2.5 within a 150-km radius of the site. Seismic activity at a M2.5 level would not generally be felt by an individual at the surface. This network of seismic monitors will be utilized in the development of a detailed seismic model of the area

Geoscience Attributes

NATURAL RESOURCE POTENTIAL

- No significant oil or gas was encountered in three vertical boreholes drilled on site, nor in several historic oil and gas wells drilled within 10 km of the Bruce site. There are no known industrial minerals that are unique to the site and cannot be obtained from elsewhere

TRANSPORT DIFFUSION DOMINATED

- Low bedrock permeabilities measured in deep boreholes drilled at the Bruce site are consistent with an environment where the movement of radionuclides is only possible through diffusion

- Numerical simulations of the regional and site-scale groundwater systems conducted by the University of Waterloo support the assertion of a stable, diffusion dominant system enclosing the repository

GEOMECHANICALLY STABLE

- Core samples obtained during deep borehole drilling at the Bruce site exhibit compressive strength which exceeds original understanding based on existing regional, geologic information
- The DGR opening, constructed in the Cobourg Formation beneath the Bruce site, should be dry and stable
- The Darlington Nuclear Generating Station's cooling water intake/discharge tunnels, constructed in the Cobourg Formation 30 m beneath Lake Ontario, provide evidence that the formation can sustain a stable, dry opening with minimal rock support

Construction during Darlington cooling water intake tunnel

Geoscientific Site Characterization

PHASE ONE

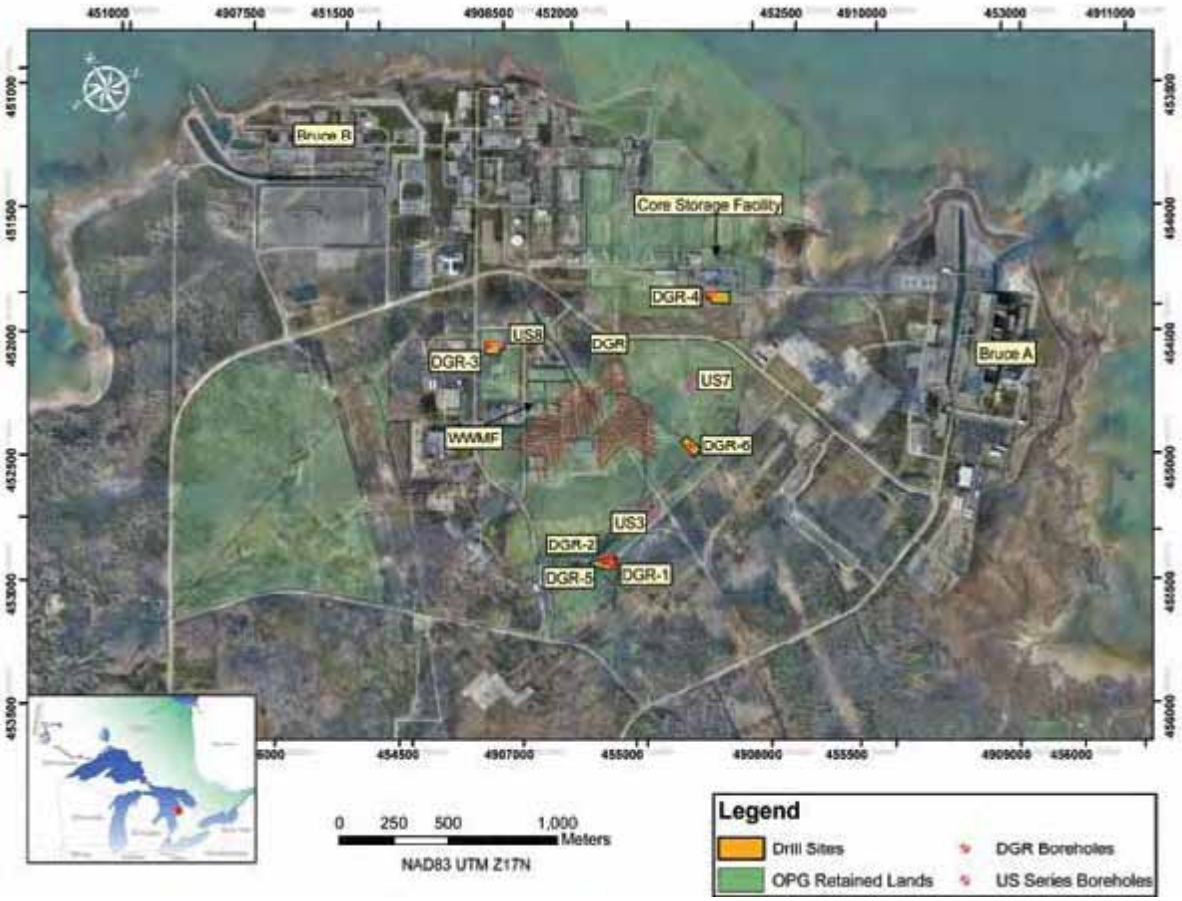
A four-year, step-wise series of scientific investigations began in 2006 to verify the ability of the geology at the Bruce site to safely isolate and contain low and intermediate level nuclear waste. Phase One included the following test programs:

- 2D seismic reflection survey to image the sedimentary bedrock
- Three low-level seismographs installed at three locations within a 50-km radius of the Bruce site to monitor low level seismic activity
- Drilling and coring of vertical boreholes DGR 1 to 463 metres and DGR 2 to 863 metres to provide rock core samples for laboratory tests to measure physical and chemical rock properties
- Downhole geophysical logging of boreholes with various instruments to determine the different layers (formation contacts), rock density and porosity
- Hydraulic borehole testing to measure bedrock formation permeabilties
- Installation of Westbay multi-level groundwater monitoring equipment to allow long-term monitoring of deep groundwater conditions

PHASE TWO

- Phase Two of the Geoscientific Site Characterization began in April 2008 with the drilling, coring and instrumentation of two additional vertical boreholes at separate sites
- DGR 3 and DGR 4 were drilled to about 860 m in 2008
- Two additional steeply inclined boreholes will be drilled, cored and tested in 2009
- Triangulation of the boreholes provides evidence as to the nature and predictability of the stratigraphic, geochemical, and hydrogeologic properties of horizontally-layered limestone and shale rock formations

Deep Borehole Drilling Data Supports Historical Understanding of Site



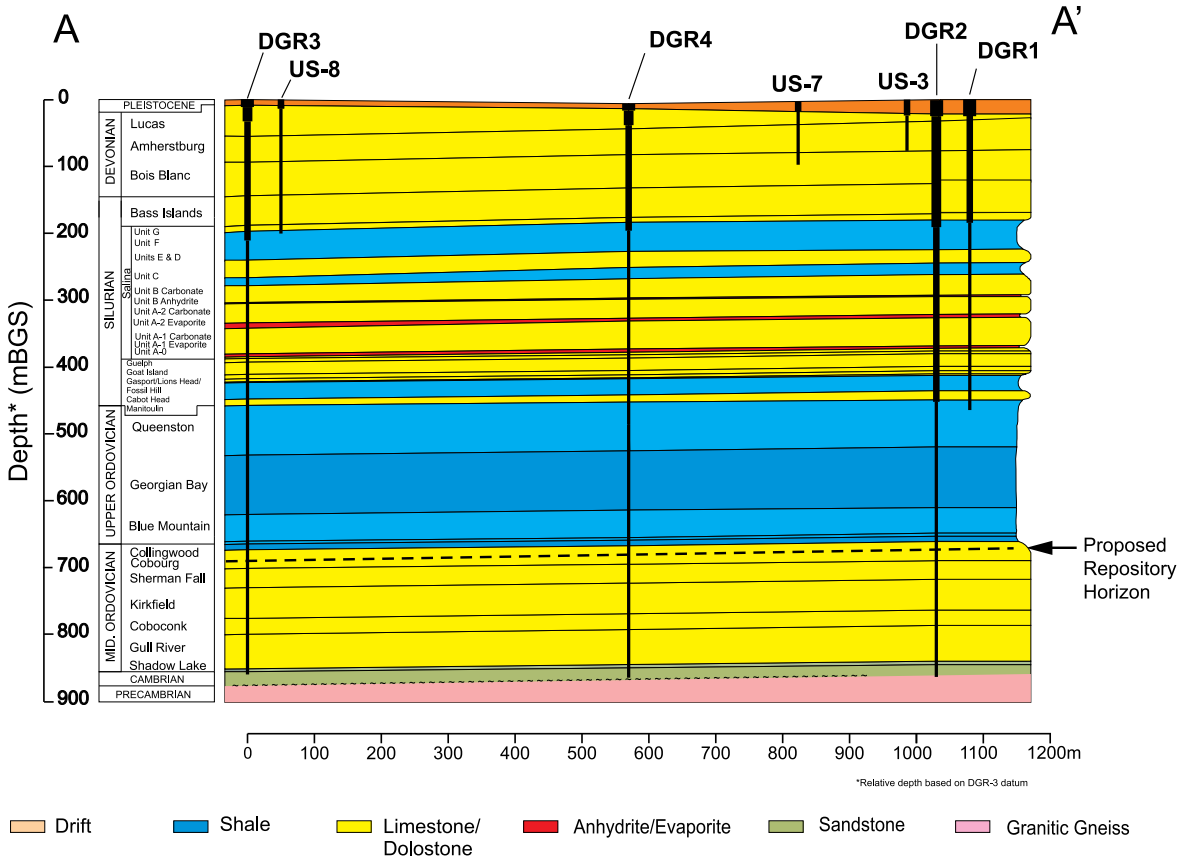
Six boreholes are positioned in a triangle formation outside of the DGR footprint to maintain the integrity of the proposed DGR site

Geoscientific investigations to date, in support of the existing regional and historical information about the site, have shown that the geology is:

> predictable
> geomechanically stable
> seismically quiet
> characterized by natural barriers which can isolate and contain the waste
> without natural resource potential

Further studies and research will add to the body of data already assembled.

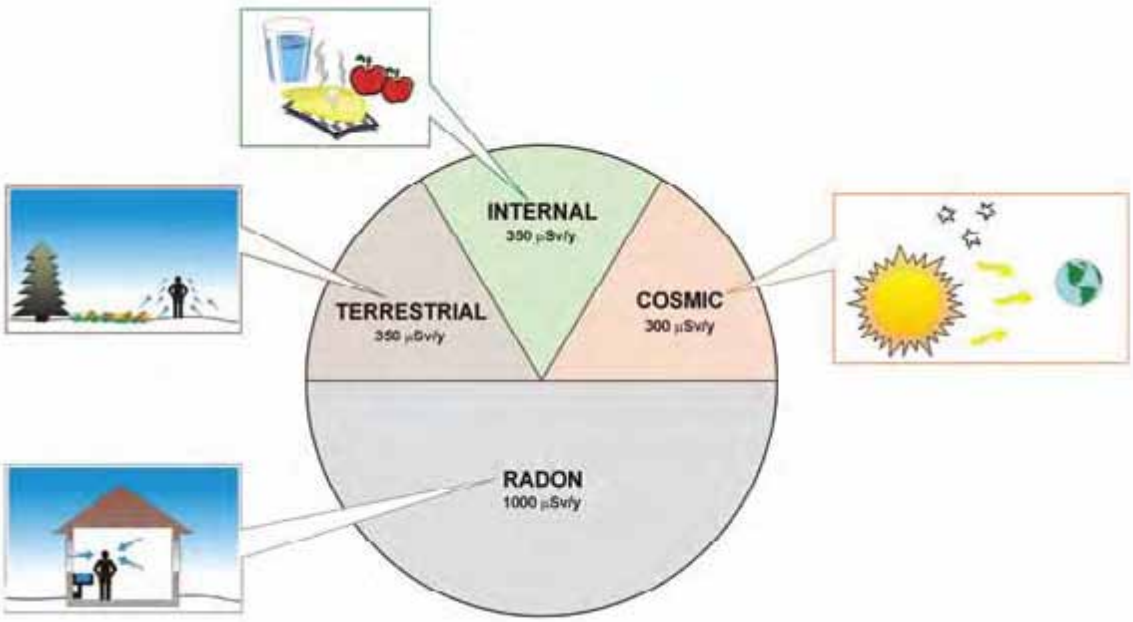
Borehole Stratigraphy Diagram



Geologic cross-section as shown on DGR Borehole Location Plan

Radiation Safety Background

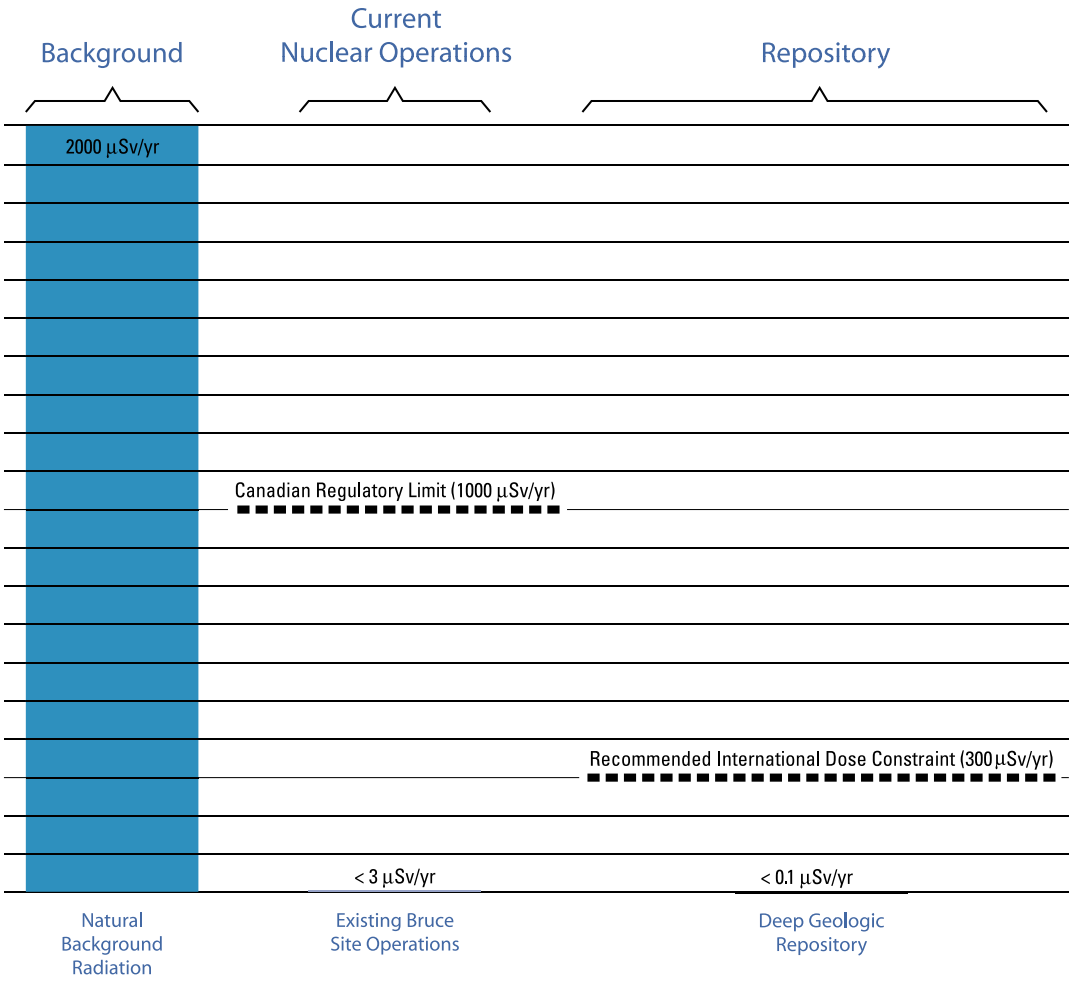
- Sievert is a unit of measure used to describe the effective dose of ionizing radiation received by people. Dose is often expressed in millionths of a Sievert, or microSievert (μSv)
- Natural background radiation averages about 2,000 μSv per year. This represents the amount of radiation dose that the average person in Canada receives each year from all natural sources
- The radiation received from a chest x-ray is 60 μSv
- Dose rate to the public, living at the site boundary, from the Bruce site activities is less than 3 μSv per year. Dose rate to the public, living at the site boundary, from the WWMF is less than 0.1 μSv per year



This diagram shows the range of sources of natural background radiation in Ontario. People are exposed to radiation from a number of natural sources such as the sun and the bedrock, and human activities such as medical examinations and power generation.

Preliminary Safety Assessment

- The safety assessment of the DGR is being completed by a team led by Quintessa Limited, a consulting firm based in the United Kingdom, which specializes in safety assessment of waste management facilities
- This chart shows the dose rate estimates for the Deep Geologic Repository. Maximum estimated doses to humans are well below the international standards and natural background levels
- A detailed safety assessment is well underway, using the latest scientific information from the Bruce site and design information



Safety Assessment

- Safety assessments assess the potential impacts of the DGR both during the operational as well as the period after the underground portion is closed, far into the future

- Observations from preliminary results from 2003 and 2007 indicate:
  - > Host rock is effective in retarding radionuclide movement
  - > The majority of radioactivity will decay in and around the repository
  - > Radionuclides will diffuse through the rock layers at extremely slow rates (less than one metre per 1000 years)
  - > Estimated dose to the public after 100,000 years is less than 0.1 µSv per year, well below the recommended international dose constraint

- Updated safety assessments will consider:
  - > Normal operation and accidents
  - > Pre-closure and post-closure periods
  - > Potential effects on humans and biota

International Experience with Repositories

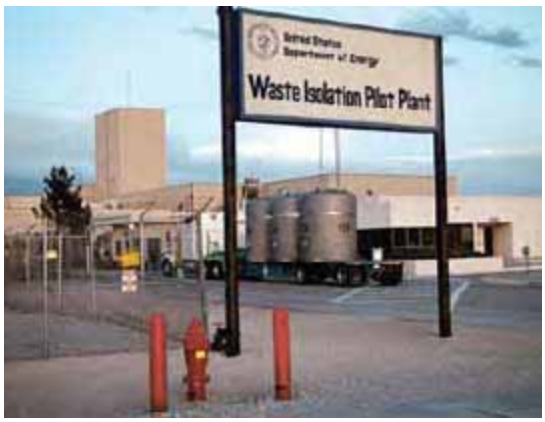
A proven history with low and intermediate level waste

- The DGR has benefited from first-hand visits to long-term management facilities in Sweden, Finland and the United States. Information learned about surface facilities, repository access, hoisting, lay-out and material handling is being utilized in the design of the DGR. Such international collaboration is extremely beneficial in terms of experience, the exchange and analysis of reports and visits with key personnel

- The Forsmark facility in Sweden opened in 1988 and is located at the Forsmark nuclear power station site

- The Olkiluoto (VLJ) facility in Finland began operation in 1992 and was excavated to a depth of 70 to 100 m underground in crystalline rock. It is located near the Olkiluoto nuclear power station

- The Waste Isolation Pilot Plant (WIPP) located in New Mexico, United States is excavated to a depth of 600 m in a bedded salt formation and has been operating safely since 1999



Left: **Sweden's Forsmark Repository** Right: **Waste Isolation Pilot Plant in New Mexico**

Independent Review and Oversight

- A Geoscience Review Group (GRG) was established in 2005
- GRG members have, between them, over 100 years of work experience in international nuclear waste programs in Japan, Hungary, Switzerland, Sweden, Finland, Korea, USA and UK
- By providing peer review and oversight, the GRG ensures the DGR project will benefit from international experience in all aspects of the geoscientific site characterization

Geoscience Review Group: **Dr. Joe Pearson (USA), Dr. Derek Martin (Canada), Jacque Delay (France) and Dr. Andreas Gautschi (Switzerland) examine core samples taken from beneath the Bruce site**

Keeping You Informed

- Consultation with the public will continue throughout the six to eight year regulatory process at an intense level through newsletters and publications, open houses, website, speaking engagements, attendance at public events with mobile exhibit, briefings with key stakeholders including municipal, provincial and federal politicians, and media

Consultation with Aboriginal Peoples

- A Protocol agreement, signed by Saugeen Ojibway Nations (SON), OPG, and NWMO, provides a framework for SON's participation in the regulatory approval process and for the DGR project

- Discussions with the Historic Saugeen Métis and the Métis Nation of Ontario about the proposed DGR project have been initiated to facilitate their participation in the regulatory approval process

For more information please visit **www.nwmo.ca/dgr**

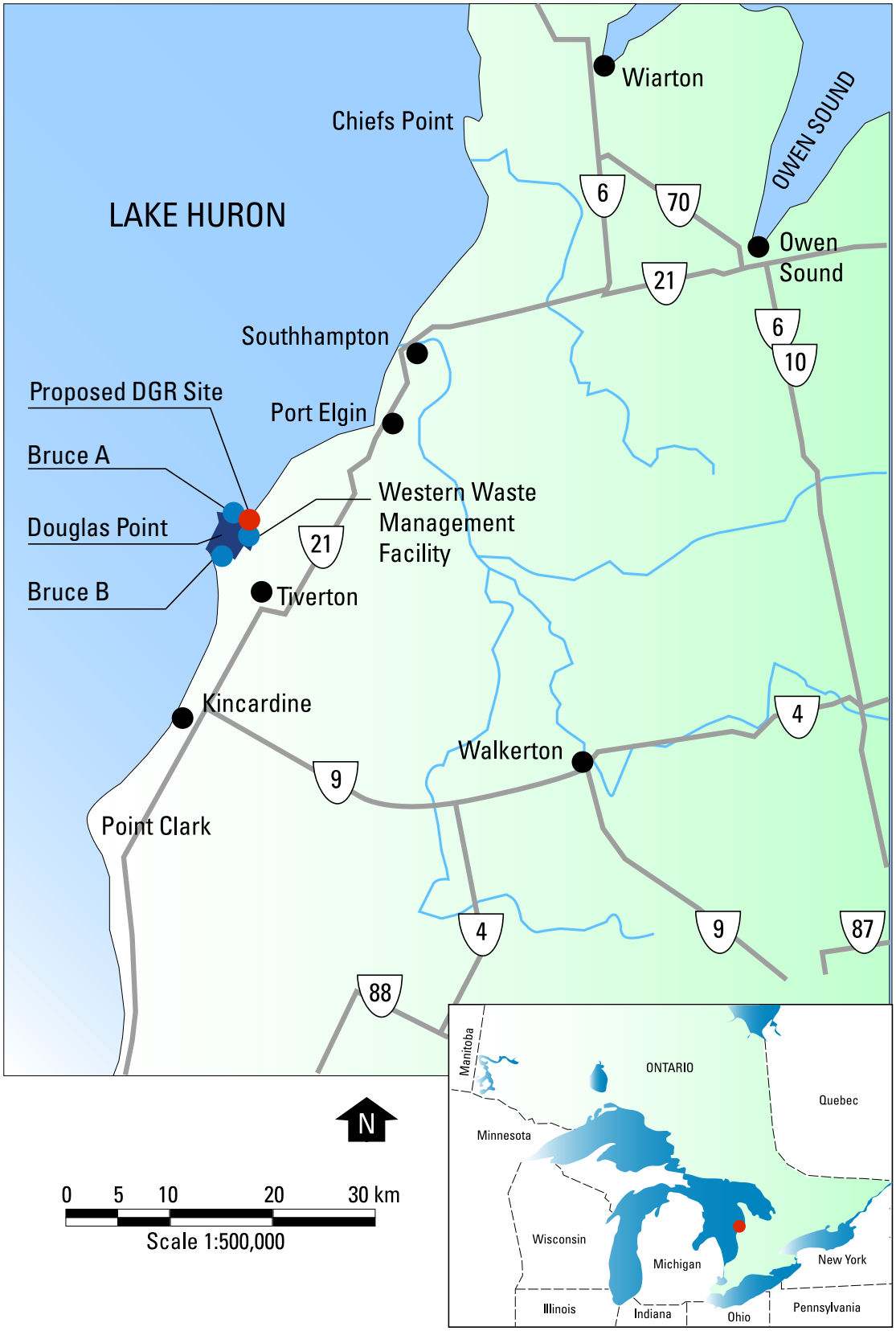
DEEP GEOLOGIC

REPOSITORY

FOR OPG's LOW & INTERMEDIATE LEVEL WASTE

ANNUAL REPORT
2008

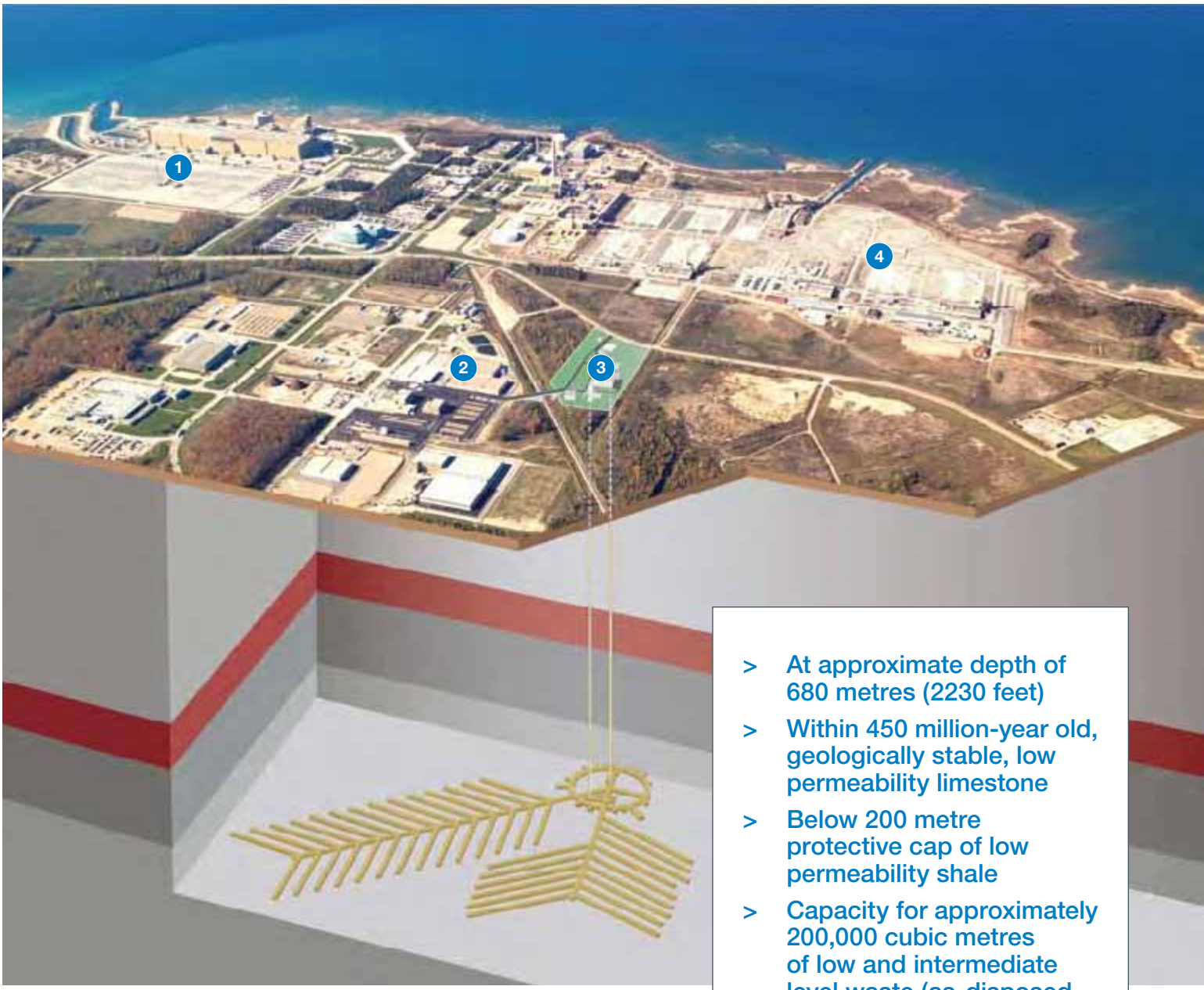
nwmo
NUCLEAR WASTE MANAGEMENT ORGANIZATION
SOCIÉTÉ DE GESTION DES DÉCHETS NUCLÉAIRES



The Deep Geologic Repository is proposed adjacent to the Western Waste Management Facility in the Municipality of Kincardine

Contents

Key Features



1: **Bruce B Generating Station**
2: **Western Waste Management Facility**
3: **DGR Project Site**
4: **Heavy Water Plant Lands**

- At approximate depth of 680 metres (2230 feet)
- Within 450 million-year old, geologically stable, low permeability limestone
- Below 200 metre protective cap of low permeability shale
- Capacity for approximately 200,000 cubic metres of low and intermediate level waste (as-disposed volume equivalent to 160,000 cubic metres as stored at WWMF)

The DGR Project

Following completion of an Independent Assessment Study undertaken jointly by OPG and the Municipality of Kincardine in 2004, a Host Community Agreement was negotiated. A telephone poll conducted within the Muncipality of Kincardine by an independent company indicated community support. Ontario Power Generation (OPG) initiated the regulatory approvals process for the proposed Deep Geologic Repository (DGR) in 2005. The project has received the support of all municipal councils in Bruce County.

In 2008, project activities related to geoscientific characterisation, repository safety analyses, environmental assessment and conceptual facility engineering design continued. These activities are being conducted in support of the regulatory approvals process, through which OPG expects to receive a site preparation and construction licence in 2012. The Project, if approved, will provide long-term management of approximately 200,000 m^3 (as-disposed volume) of low and intermediate level radioactive waste (L&ILW).

The waste, which is produced as a result of the past and ongoing operation of OPG-owned nuclear generating stations at Pickering, Darlington and Bruce, will be emplaced in rooms about 680 m (2230 feet) underground in very low permeability Ordovician age limestone that is overlain by thick and very low permeability shale. This rock has remained stable for more than 450 million years through geologic upheavals, major climate change and glacial cycles. It will provide assurance for the safe containment and isolation of the waste many thousands of years into the future.

The DGR will be comprised of surface facilities to receive the waste and to support the underground facilities which include two shafts, and underground tunnels, emplacement rooms and maintenance areas excavated in the rock. The waste will be taken underground by hoist via a vertical shaft and placed in a series of emplacement rooms.

The DGR will be located adjacent to the Western Waste Management Facility (WWMF) at the Bruce site, near Tiverton, Ontario in the Municipality of Kincardine. Much of the waste to be placed in the DGR is already located at the WWMF.

Based on the current proposed schedule, construction of the DGR will commence in 2013 subject to receiving a construction licence, an operating licence will be sought in 2017, and waste will be placed in the DGR commencing around 2017. Emplacement activities would continue for a period of approximately 40 years. Once the DGR ceases to receive waste, and after a period of environmental monitoring, regulatory approval would be sought to decommission the facility. On receiving a decommissioning licence, the DGR would be closed by sealing the vertical repository access shafts with engineered seals comprised of clay-based, asphaltic and concrete materials.

Borehole hydraulic testing trailer

Transition of the DGR Project to the NWMO

Effective January 1, 2009, OPG contracted with the Nuclear Waste Management Organization (NWMO) to undertake a number of activities on its behalf to develop the DGR. As part of the arrangement, OPG staff that had been working on the DGR project became NWMO employees.

The NWMO is a not-for-profit company established under the Nuclear Fuel Waste Act by OPG, Hydro Québec and New Brunswick Power, the nuclear power utilities in Canada, to implement a long-term solution for Canada's used nuclear fuel.

The NWMO's implementation of Adaptive Phased Management (APM) plan for the safe management of Canada's used nuclear fuel is a separate project from OPG's proposed Deep Geologic Repository (DGR) and will remain so. Combining the expertise of key staff allows them to benefit from mutual experiences and lessons learned in the application of technology for deep geologic repositories, community consultation, and the collaboration with international partners. The DGR project will benefit from skills, knowledge and relationships developed in the APM program.

OPG continues to be the sole owner of the DGR and the DGR will only accommodate OPG's low and intermediate level waste as described in the current Host Community Agreement. The NWMO will be the Project Manager for the DGR project overseeing licensing and development activities. The DGR Project will proceed as planned, while honouring all commitments in the hosting agreement with the Municipality of Kincardine.

Regulatory Approval Process

The regulatory approval process that was initiated in December 2005, continues to progress toward a site preparation and construction licence. The DGR project was referred to a review panel under the Canadian Environmental Assessment Act, in June 2007. Subsequently, in April 2008 the Canadian Nuclear Safety Commission (CNSC) and the federal Environment Minister, jointly issued draft guidelines for the Environmental Impact Statement (EIS) and the Joint Review Panel Agreement for a public review period.

After completing the public review process, which included providing participant funding to six environmental groups to assist them in participating in the process, the CNSC and Canadian Environmental Assessment Agency issued the final guidelines for the EIS and the Joint Review Panel Agreement on January 26, 2009. The next steps in the approvals process include site specific studies to verify the suitability of the Bruce site for implementation of the DGR concept and analysis of the potential effects of the project on the environment. Upon completion of the field studies and analysis of the results, the various studies will be documented in the EIS. The EIS, along with the Preliminary Safety Report, will be submitted to the Joint Review Panel in 2011. The Panel will issue the documentation for a public review period, and will also conduct its own review. The public review period will be followed by a public hearing where stakeholders will have the opportunity to present their feedback on the DGR project.

After the hearing the Panel makes a recommendation to the Minister of the Environment who takes it to Cabinet for the final decision. The EIS must be accepted before a site preparation/construction licence can be issued.

Geoscientific Site Characterisation Program

Geoscientific site characterisation activities continued in 2008 as part of a multi-phase 4-year program initiated in 2006. The geoscience work program is divided into two key areas; site-specific characterisation studies that involve, among others, a multi-disciplinary deep drilling program at the Bruce site; and a Geosynthesis program that combined with information from the site-specific studies describes the geoscientific basis for understanding the past, present and future geologic evolution of the site as it influences DGR safety.

Geoscience Activities

During 2008, key progress involved the completion of two deep vertical boreholes, DGR-3 and DGR-4, which were drilled, cored and tested through the sedimentary sequence underlying the Bruce site to depths of 860 m below ground surface. The addition of these two boreholes in combination with information from two others completed in 2007 has generated a 3-dimensional understanding of the geologic conditions and properties for the bedrock formations hosting and enclosing the DGR. The results of the current site investigations were, in part, included in the Phase I Geosynthesis and six accompanying Supporting Technical Reports, which were issued in late 2008. These peer-reviewed reports, listed below, provide a description and synthesis of regional geologic, hydrogeologic, hydrogeochemical and geomechanical information that will aid development of the DGR Safety Case.

- Phase 1 Geosynthesis
- Phase 1 Long Term Climate Study
- Phase 1 Long Term Cavern Stability
- Phase 1 Regional Geology, Southern Ontario
- Phase 1 Regional Geomechanics, Southern Ontario
- Phase 1 Regional Hydrogeochemistry, Southern Ontario
- Phase 1 Hydrogeology Modelling

These reports are available on the OPG web site at: **www.nwmo.ca/dgr**.

Geoscientific investigations of the Bruce site are scheduled for completion in spring 2010. Upon completion, the program will have benefitted from the completion of 6 deep boreholes, including, two inclined deep boreholes, DGR-5 and DGR-6, planned for 2009. These two boreholes will be drilled on an incline of about 65° to purposefully attempt to intersect sub-vertical bedrock structure of potential interest to the DGR Safety Case. A final geosynthesis document describing the site characteristics based on both regional and site-specific studies as relevant to DGR safety is scheduled for completion in the fall of 2010.

Top: **Rock core retrieved from DGR-3**

Bottom: **Workover rig hydraulic testing at DGR-4**

Top: **Geologists show keen Interest in the core from DGR-3 and DGR-4**

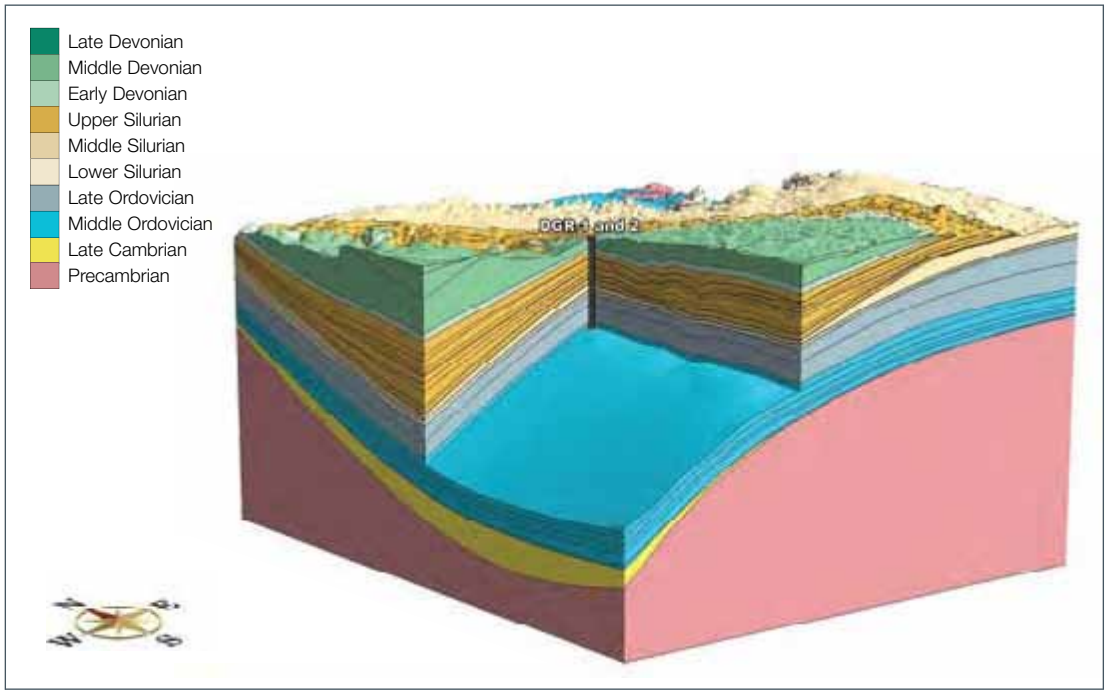
Bottom: **Technical experts gather for a DGR Geosynthesis Workshop**

An Evolving Understanding: Interim Results

The Geoscientific investigations conducted to date at Bruce site are providing useful insight as to the ability of the geologic layers hosting and enclosing the proposed DGR to safely contain and isolate the L&ILW. Specific attributes of the Bruce site that contribute to this understanding are described below.

PREDICTABILITY

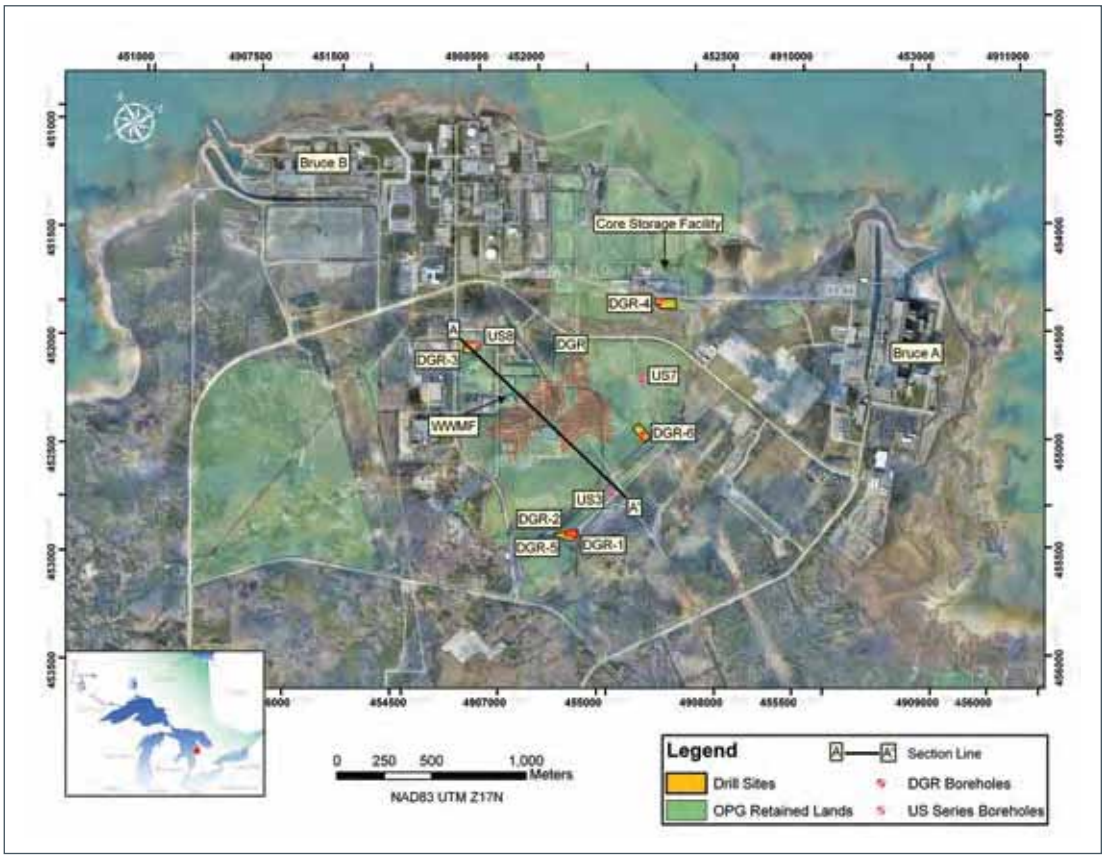
Regionally, the sedimentary bedrock stratigraphy was re-constructed using over 300 historical oil and gas well records within a 35,000 km^2 area surrounding the Bruce site. This stratigraphic model defines a near horizontally-layered, relatively undeformed and laterally extensive sedimentary sequence extending beneath Lake Huron that is comprised of carbonates, shales, evaporites and sandstones with predictable 'layer cake' geometry. Consistent with this understanding, the deep borehole program has confirmed that the sedimentary sequence beneath the Bruce site is comprised of 34 bedrock formations with a combined thickness of about 840 m. Individual formation contact elevations and thicknesses, particularly at the proposed repository horizon, have been found predictable to within metres. The repository, situated in the argillaceous limestone Cobourg Formation, is confirmed to be overlain by 200 m of shale.



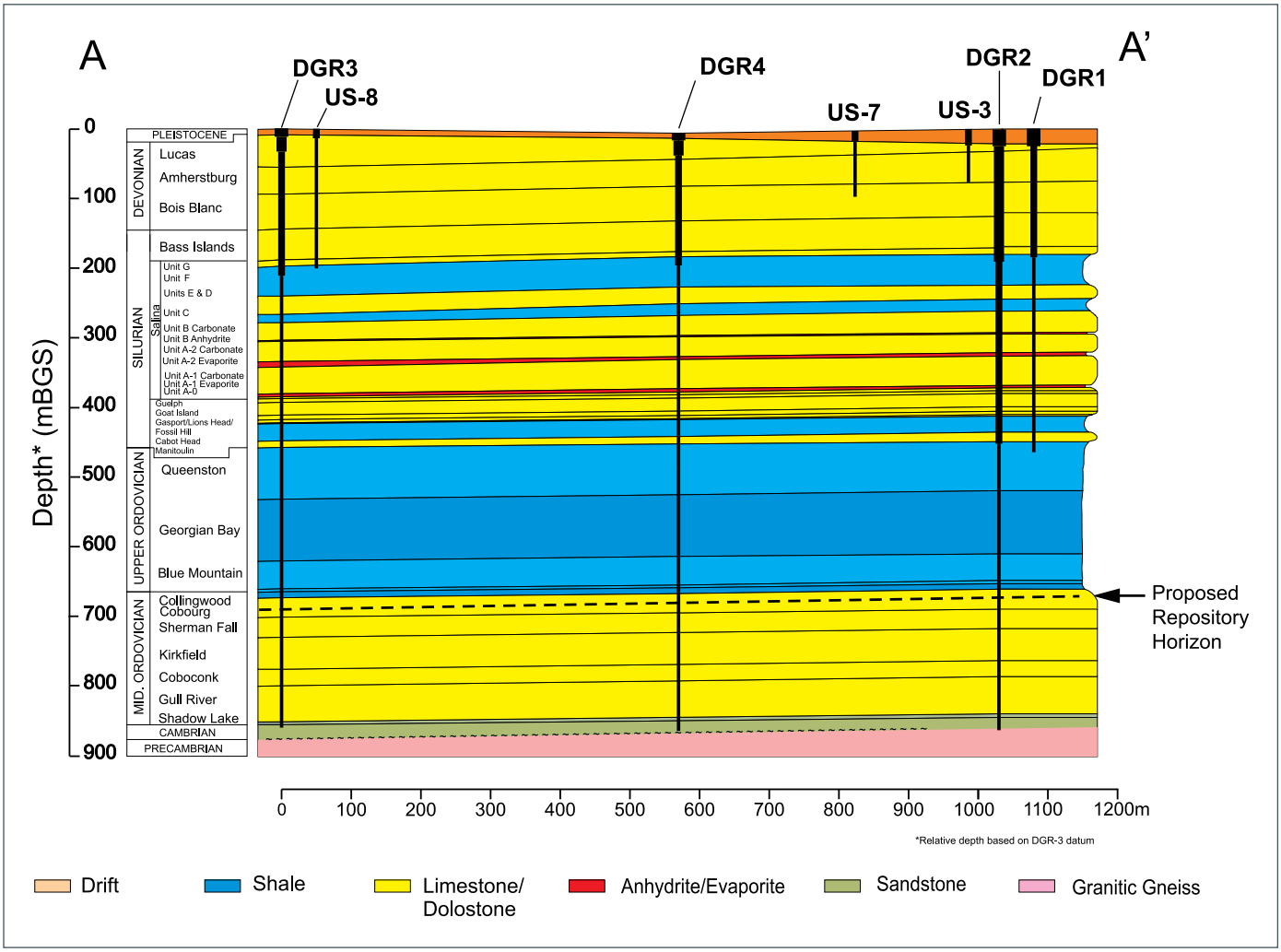
Michigan Basin – stratigraphic layering of rock

MULTIPLE NATURAL BARRIERS

The results of deep borehole testing confirm that the DGR repository horizon is under- and overlain by multiple layers of low permeability (≤10^{-12} to 10^{-14} m/sec) sedimentary bedrock. The repository is situated in a deep saline groundwater domain enclosed by Ordovician (490–443 million years) age rock formations. The overlying layers consist of three low permeability and laterally continuous shale formations (thickness 200 m). The underlying layers are limestone (thickness 150 m). A sequence of moderate to low permeability, Silurian (443–417 million years) age shales, dolostones, and evaporites (thickness 190 m) lie above these Ordovician formations within an intermediate groundwater domain. The borehole testing results are consistent with long-term borehole hydraulic monitoring data that reveal vertical groundwater pressure distributions within the sedimentary sequence. The presence of this pressure distribution can only exist with extremely low formation scale permeabilities and the absence of permeable vertical pathways.



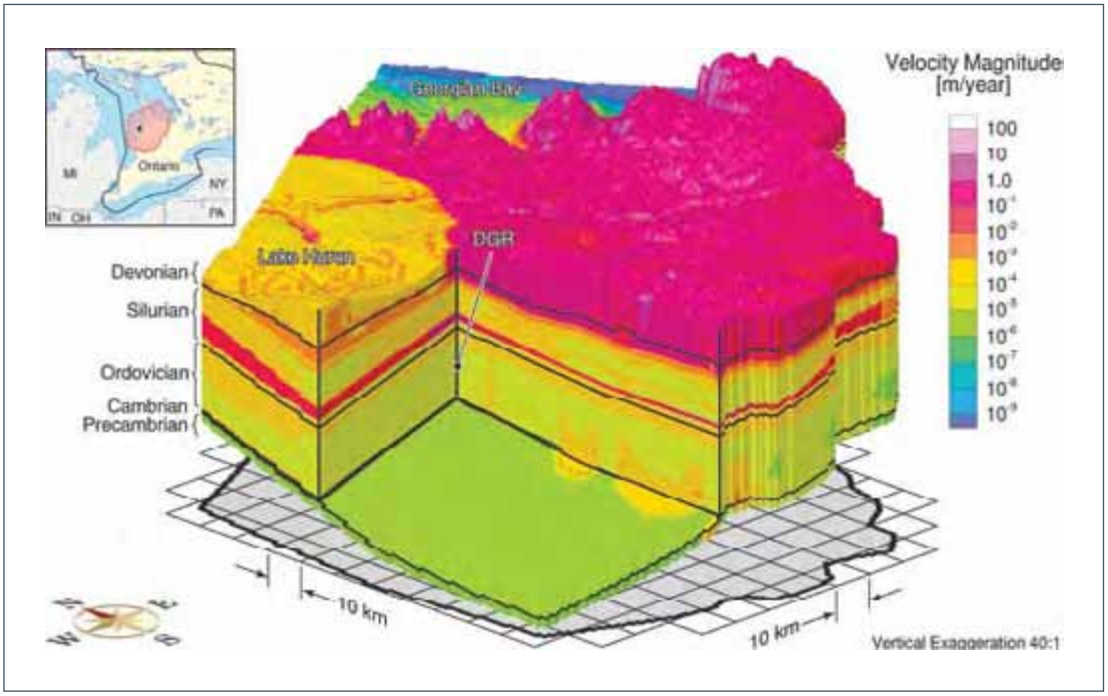
2009 Bruce Site Borehole Locations



Geologic cross-section as shown on DGR Borehole Location Plan

CONTAMINANT TRANSPORT DIFFUSION DOMINANT

The deep groundwater regime surrounding the DGR is ancient and is one in which contaminant transfer is diffusion dominated. Field and laboratory data gathered during deep borehole hydrogeologic and hydrogeochemical testing confirms this. The evidence includes the horizontally stratified, laterally continuous, low permeability sedimentary formations beneath the Bruce site and the occurrence of extremely saline (Total Dissolved Solids ≥ 250 gm/L) and chemically distinct bedrock formation groundwater and pore fluid compositions. These characteristics are all indicative of emplacement in the geologic past. This information contributes to the completion of numerical simulations of the regional and Bruce site groundwater movement. These simulations, which consider uncertainties related to past, present and future evolution of the groundwater system, consistently predict a stable diffusion dominant system enclosing the repository. It is estimated that solutes at the repository horizon would take more than 8 million years to discharge.

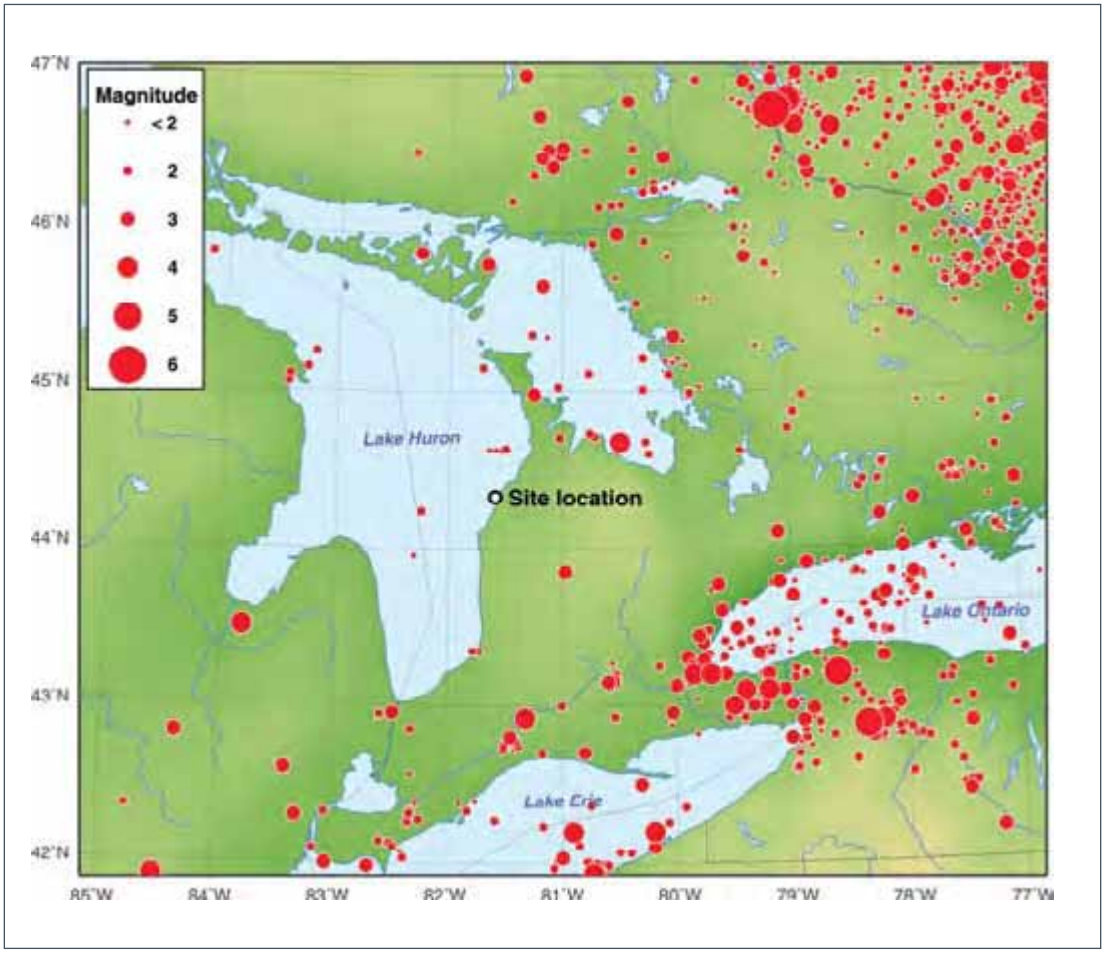


Modelling results – groundwater flow velocities
Phase 1 regional hydrogeology

SEISMICALLY QUIET SITE

The Bruce site is located within the tectonically stable interior of the North American continent, and is comparable in terms of stability to the Canadian Shield. Historic seismicity records indicate that there has not been a seismic event near Bruce site exceeding Magnitude 5 in over 180 years of observation.

A micro-seismicity borehole monitoring network was installed in the summer of 2007 to allow improved monitoring of micro-seismicity within a 50 km radius of the Bruce site. Monitoring of the new network is undertaken by the Geologic Survey of Canada's Canadian Hazard Information Service. Monitoring to date has not detected natural seismic activity greater than Magnitude 2.5 within a 150 km radius of the site. Seismic events below Magnitude 2.5 would not normally be felt at surface.



Seismic activity (start of historic records – 2007)

GEOMECHANICALLY STABLE HOST ROCK

The repository opening should be dry and stable. This assertion is supported by evidence gathered through review of underground construction experience within the Cobourg Formation, coupled with results from borehole permeability testing, geomechanical core testing, and numerical simulations of operational and long-term repository opening stability. A practical example of an underground opening in the Cobourg Formation includes the Darlington Nuclear Generating Station cooling water intake tunnel, which provided a stable, dry opening with little rock support only 30 m beneath Lake Ontario.

Darlington cooling water intake tunnel

NATURAL RESOURCE POTENTIAL IS LOW

The results of petroleum well drilling, and the coring and testing of the deep boreholes on Bruce site, coupled with knowledge of the geologic setting, strongly suggest that viable commercial oil and gas reserves do not exist within 40 km of the Bruce site. Commercially viable base metal deposits have not been identified in the study area.

GRG examines rock core

Geoscience Review Group

The mandate of the Geoscience Review Group (GRG), who provided guidance and oversight of the first phase of the geoscientific studies, was renewed for the second phase of the Geoscientific Site Characterisation Program. The GRG comprises internationally renowned scientists and engineers whose role on the DGR project is to ensure that information and lessons learned from their experience in similar international programs are reflected in the DGR project.

During 2008, the GRG attended workshops at which the results of the Bruce site and regionally based geosynthesis work programs were presented, and provided input and comment. The GRG also worked with the geosynthesis team to reconcile comments on the Phase 1 Geosynthesis report, issued in 2008.

Safety Assessment

The safety of the DGR during the operational phase and over the long-term, after operations have ceased and the facility has been decommissioned, are being studied. These technical studies of the operational and long-term safety of the proposed DGR will contribute to the environmental impact statement and the submissions supporting the site preparation/construction licence application. Canadian and international guidelines are being followed in the safety assessments.

Preclosure Safety

The preclosure safety assessment covers the period from the start of operations to the closure of the facility. Activities are currently focused on identifying the potential radiological impact of the DGR on workers and members of the public and developing an estimate of the radiological emissions for use in assessing possible impacts. Work is also being done to identify accidents, which could occur as a result of DGR operational failures or external hazards. The potential consequences of these accident scenarios are also assessed.

Based on experience from the WWMF operations, small amounts of tritium and C-14 are expected to be released from the DGR under normal operating conditions, dropping to zero as the DGR is closed. The potential sources of air emissions are the waste receipt building and the repository ventilation shaft. The potential sources of water emissions are the waste receipt building and the sump water pumped out of the repository.

The potential doses due to these small releases are estimated to be similar to the low doses presently observed for the WWMF, where many of the wastes are currently located. These results suggest that there are no concerns with respect to exposure to members of the public during normal operations of the DGR.

Accident scenarios were postulated for the DGR facilities, both above and below ground. These accidents were screened for likelihood and worst-case scenarios were identified for analysis. The accidents considered included breach of waste package and fire. The preliminary analysis suggests that radioactivity released from above or below ground accidents will not harm members of the public.

Future work will continue interacting with the engineering team to refine the design, and to improve the assumptions used in the safety analysis.

Postclosure Safety

The postclosure safety assessment period will start when the facility is closed and sealed, and continues to the time when the maximum dose impact is predicted to occur. The purpose of the safety assessment is to quantitatively assess the postclosure radiological and non-radiological safety of the proposed DGR. In the assessment, uncertainty in the future evolution of the site is addressed by analyzing a range of future scenarios.

Ensuring the safety assessment incorporates information from the conceptual design report

Scenarios being considered for the future evolution of the DGR system include the Normal Evolution Scenario, which describes the expected long-term evolution of the repository and site following closure, and four disruptive scenarios, which consider events with low probability that could disrupt the repository system. These include, for example, future human intrusion into the repository, as well as the effects of a very large earthquake.

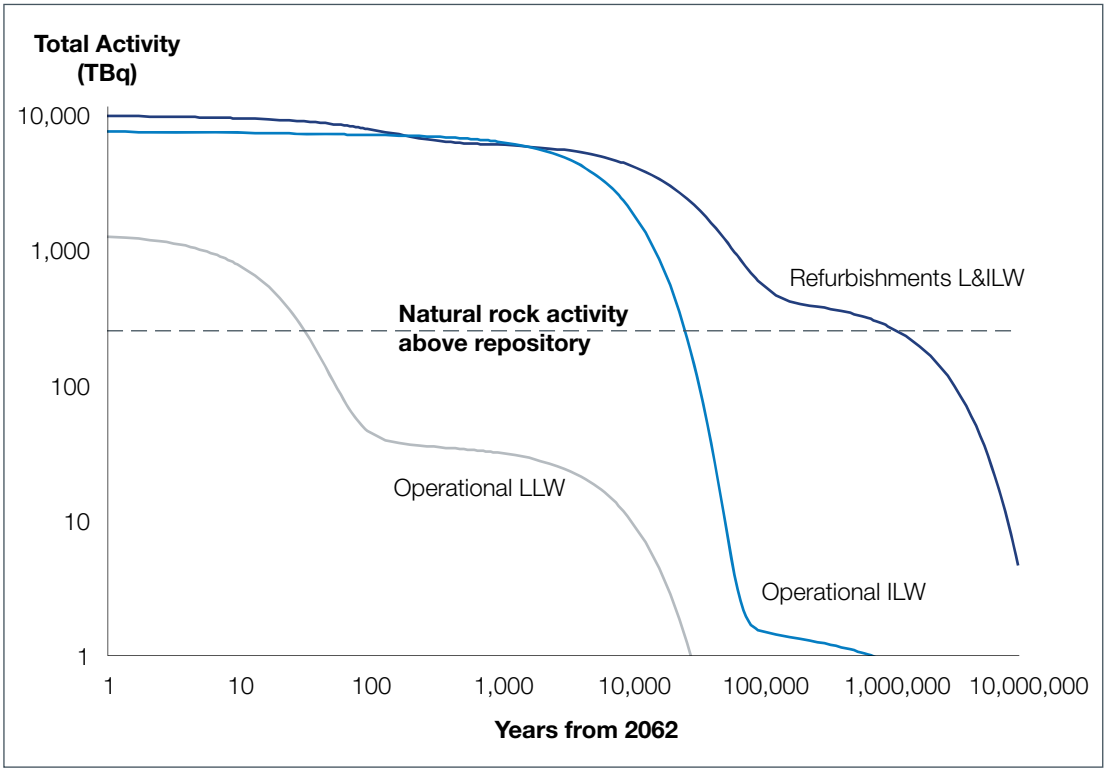
The current results of this work predict that there would be very little impact from the repository. Observations which contribute to this prediction include that the host rock is very effective in retarding movement of radionuclides, and the repository will take a very long time to resaturate. Other key observations which will be considered further in ongoing work include the importance of the sealed shaft as a potential pathway for radionuclides, and the importance of C-14 containing carbon dioxide and methane gas generated from decomposing organic and plastic waste.

Waste Inventory

The understanding of the waste inventory is based on more than 25 years of historical data. The radionuclide content has been measured and estimated using a variety of standard methods. The total estimated activity for disposal in the repository is approximately 980 PBq (9.8×10^{17} Bq) at 2017, the earliest possible start of operation. At the earliest assumed closure time (about 2062), the total activity is about 17 PBq (1.7×10^{16} Bq) (taking into account new waste being emplaced as well as decay of already stored wastes).

The total radioactivity will decrease with time due to radioactive decay. The following figure illustrates the radioactivity within the three major classes of waste – operational low-level waste (e.g. cleaning materials, mops), operational intermediate-level waste (e.g. water cleaning resins), and refurbishment waste (e.g. steam generators, pressure tubes). Initially, key radionuclides are tritium and C-14. At long times, the residual radioactivity is primarily due to Zr-93. For comparison, the low natural radioactivity of the host rock over the repository is also shown in the figure.

In 2008 additional work was undertaken to improve our knowledge of waste in areas of most importance to the safety case. This work included sampling of specific wastes currently stored at the WWMF. Results of this work will provide input to future safety assessment work.



Total radioactivity in the DGR as a function of time

Conceptual Design of the DGR

Conceptual layout of DGR surface facilities adjacent to WWMF

A conceptual design for the DGR was completed in 2008. This work updates and advances previous conceptual design work completed in 2004. The scope of work included all aspects of the DGR, including its construction, the receipt of waste from the WWMF and nuclear generating stations, and the emplacement of the waste in the DGR.

The surface features of the DGR include the main shaft, ventilation shaft and waste rock management area. The main shaft area will have a headframe equipped with a hoist to handle a 40-tonne payload, a waste package receiving building, and buildings housing equipment to heat and cool air to be delivered underground. The waste package receiving building and shaft office will be directly connected to the main shaft headframe building. In addition, a maintenance shop and storage area will be attached to the main shaft headframe building. The ventilation shaft area will include a headframe building with airlock, a hoist house, a waste rock bin, and an exhaust fan building.

A bridge will be constructed to provide the link between the existing WWMF and the DGR.

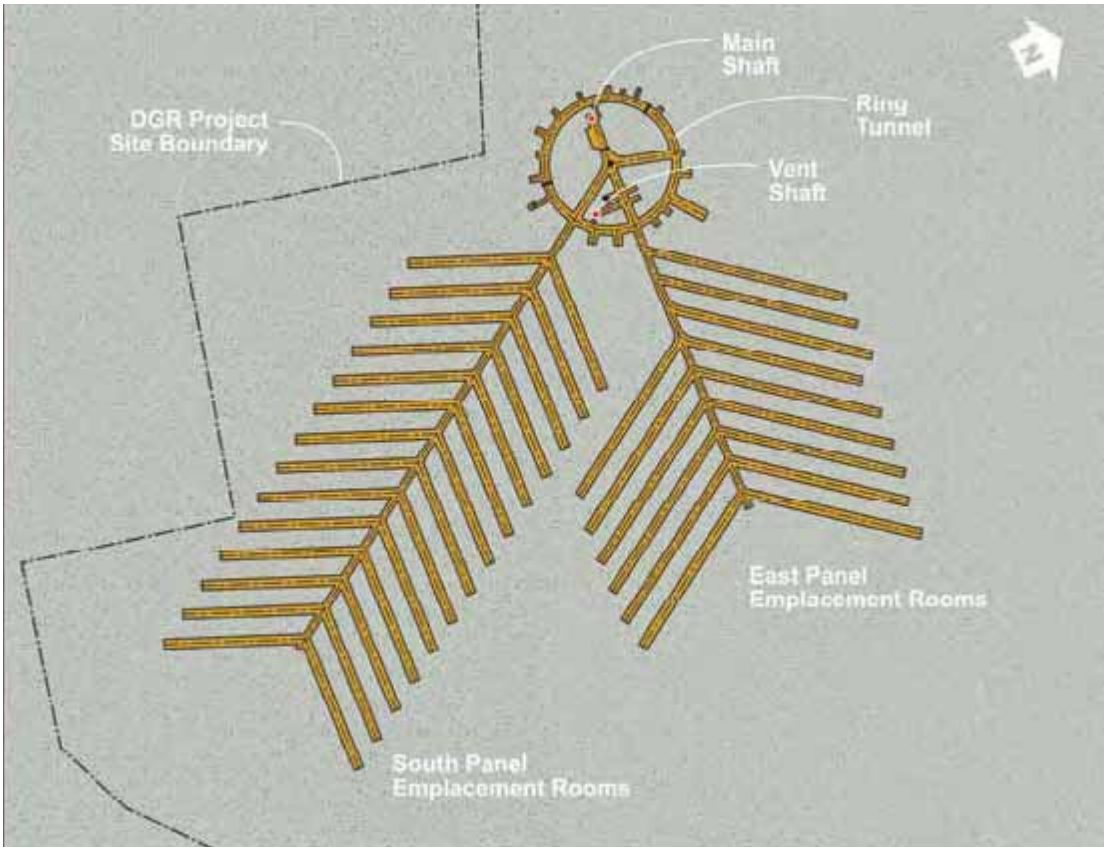
The reference capacity of the DGR is nominally 200,000 m^3 of “as-disposed” waste.

It is currently assumed that the DGR will be fully developed during initial construction.

The underground layout of the repository includes two vertical shafts located on a central ring tunnel. Two emplacement room access tunnels radiate out to the south and east, and smaller ancillary rooms will also be provided for administrative and maintenance activities off the central ring tunnel. This arrangement facilitates having all underground infrastructure near to the shafts, while keeping the emplacement rooms further from areas that are normally occupied or high activity areas.

Shafts will be excavated by traditional drill and blast methods in the harder dolostones, with vertical roadheaders currently being considered to excavate in the shales. A horizontal roadheader is the proposed excavation method for the access tunnels and emplacement rooms.

Storage for the waste rock volume, estimated to be about 700,000 m^3, will be at surface to the northeast of the two shafts.



Top: **Conceptual drawing of the surface facilities of the DGR**
Middle: **Conceptual drawing of a low level waste emplacement room in the DGR**
Bottom: **DGR underground layout**

Community Engagement

In 2008, OPG continued to take its consultation activities to locations and events where the public would already be gathering. The DGR exhibit trailer, in conjunction with staff, attended the Wiarton, Port Elgin, Walkerton and Kincardine Home Shows, the Kincardine Scottish Games, the Chippewas of Nawash PowWow, the International Plowing Match, the Port Elgin Pumpkinfest, Clarington Family Safety Day, and summer markets in Kincardine and the surrounding area.

Progress was made toward reaching agreement on a Protocol with the Saugeen Ojibway Nation (SON). In April, OPG and SON initialed a Protocol and agreed to work to finalize the schedules relating to implementing the agreement before signing the final Protocol. These discussions are expected to continue in 2009 and result in signing the Protocol. At meetings to discuss the Protocol, OPG also provided updates on the status of the DGR project.

Contact was made with two local Métis Community Councils, leading to meetings with the Saguingue Community Council and the Métis Nation of Ontario to provide an overview of the DGR project and to discuss how they would like to participate in the project. These discussions are expected to continue in 2009.

In March 2008, OPG took the opportunity to present a “Geology Rocks” workshop, based on the onsite drilling activities and the rock core, to members of the Girls in Real Life Science Club. The workshop provided a day-long discussion of careers in geology, key points about the DGR, an examination of fossils, and hands-on experience classifying rocks based on rock properties.

OPG and the DGR project also sponsored and participated in the International Plowing Match which was held in Teeswater, Ontario in September 2008. This event was attended by more than 97,000 people. Attendees were from Ontario and the world, including school children and the agricultural community, many of whom visited the exhibit to obtain information and provide feedback about nuclear waste management and the DGR project.

A series of Open Houses was held in the local communities of Kincardine, Ripley, Port Elgin, Walkerton, Wiarton, Owen Sound and Chesley during November. More than 150 people attended the Open Houses, most to receive updated information on the status of the DGR project but some to learn about the project for the first time, some to express their opposition to nuclear energy or the project, and some to discuss employment opportunities for local residents in association with the project.

Top: **A representative of the next generation attends a DGR open house**

Middle: **Girls in Real Life Science participate in the DGR Geology Rocks Workshop**

Bottom: **Fall Open House 2008**

Top: **OPG on behalf of the DGR Project sponsored and participated in the 2008 International Plowing Match**

Bottom: **OPG's DGR Exhibit participated in the Nawash PowWow**

Girls in Real Life Science participate in the DGR Geology Rocks Workshop

Throughout the year, project staff made more than 45 presentations on the DGR project to local community and service groups, and professional organizations. Many of these presentations provided updates on the DGR project to groups previously addressed, but OPG was also able to extend its network to service groups in Tobermory, Grand Bend, and to professional groups in London and Port Hope.

Three DGR Project newsletters were published and distributed by mail to nearly 25,000 local residences. The newsletters focused on the conceptual design of the DGR, the geologic model for the DGR, how the information gathered to date in the geoscientific site characterisation is contributing to the safety case, the Open Houses, and the second Rock Core Workshop.

The key comments received on the project continue to be associated with whether used nuclear fuel or waste from other producers will be stored in the DGR, the proximity of the DGR to Lake Huron and the Great Lakes, and the potential for contamination of drinking water. The community stakeholder events provided an opportunity for OPG to respond to the questions and comments that are provided.

Environmental Assessment Process

Scientists assess fish population

In January, 2009, following a public review and comment period in 2008, the Canadian Nuclear Safety Commission and the Canadian Environmental Assessment Agency released the final guidelines for the Environmental Impact Statement (EIS) for the DGR project and the Joint Review Panel (JRP) agreement. The EIS guidelines identify the information needed to examine the potential environmental effects of the proposed project as well as requirements for a licence to prepare a site and for construction. The JRP agreement deals with the establishment of an independent review panel including procedures for appointing the JRP members, the proposed terms of reference (i.e., responsibilities) for the panel and the process for conducting the reviews.

The compilation and documentation of baseline environmental data to support the EIS continued in 2008. These data provide the starting point from which the potential effects of the DGR project on the environment, including the physical, cultural, social, and economic components, will be assessed.

Left: **Wild turkeys populate the Bruce nuclear site**
Right: **Habitat assessment in winter conditions**

The information compiled to date indicates that:

- 21 species of birds were identified in the project area (lands proposed for the DGR project)
- two flocks of wild turkeys nest and live at the Bruce site
- Several varieties of frogs and turtles were sited in the local study area which includes the Bruce site and nearby surrounding lands
- there is evidence of chimney building crayfish in the project area
- white-tailed deer were sighted in the local study area.

Project Schedule

The DGR project continues to be on schedule with the geoscientific characterisation work expected to be completed in 2010. This information forms the basis for the safety assessment and the environmental impact statement, which will be submitted to the review panel early in 2011. The Panel hearing is expected to take place in 2012. If the review panel accepts the environmental impact statement, the site preparation/construction licence(s) could be issued in 2012.

nwmo
NUCLEAR WASTE MANAGEMENT ORGANIZATION
SOCIÉTÉ DE GESTION DES DÉCHETS NUCLÉAIRES

www.nwmo.ca/dgr

Western Waste Management Facility

Our commitment to safe, responsible management

The electricity generated by nuclear power emits virtually no greenhouse-gas causing emissions. The by-product of electricity generated from nuclear power is nuclear waste, which is managed in a contained and controlled manner.

Every employee of OPG's Nuclear Waste Management Division recognizes and accepts the responsibility for the management of our waste in an environmentally, socially and financially-responsible manner. We are dedicated, uncompromising and absolute in our commitment to the safety of fellow employees, the public, the communities where we operate, and the environment.

Our commitment to safety and the environment

OPG has been safely storing nuclear waste from the Bruce, Pickering and Darlington generating stations for more than 40 years and we are proud of our operating record and the progress we have made towards long-term solutions for the future.

Western Waste Management Facility (WWMF) employees are well trained and regard safety for employees, the public and the environment as their top priority. They have accomplished significant milestones in these areas, such as achieving long-standing records of no "Lost Time Accidents" and excellent environmental performance. Safe work planning, safe work practices and attention to detail, along with a safety-conscious work attitude, has led to this excellent safety performance.

The WWMF has an Environmental Management System (EMS) that establishes strategies, objectives and targets for the facility to improve environmental performance. The EMS is based on the International ISO 14001 Standard, which provides a tool for ensuring and demonstrating a high standard of environmental responsibility. The WWMF was initially certified to the ISO environmental standard in 1999 and has successfully re-certified every year since.

- **OPG has been safely managing radioactive waste for more than 40 years**
- **The WWMF manages and provides interim storage of low and intermediate level waste from OPG's Pickering and Darlington nuclear stations and the Bruce Power stations**
- **The WWMF's Used Fuel Dry Storage Facility stores used fuel from the Bruce site only.**

Through employing highly qualified employees, careful planning, development of technology and equipment and the use of sound operating procedures, OPG has ensured that radioactive waste is managed safely and poses no significant risk to employees, the public or the environment.

ONTARIO POWER GENERATION

Regulatory authority

The nuclear industry is one of the most strictly regulated in Canada. The overall regulation of nuclear reactor operation and nuclear waste management in Canada is the responsibility of the Canadian Nuclear Safety Commission (CNSC). Every aspect of the management of low and intermediate level waste and used nuclear fuel is regulated by the CNSC.

What is nuclear waste?

During the operation of nuclear generating stations, waste is produced much like any other industry. Some of this waste becomes radioactive and must be handled using special procedures. OPG categorizes the radioactive waste into low, intermediate and used fuel.

Low level waste

Low level waste consists of minimally radioactive materials that have become contaminated during routine cleanup and maintenance such as mop heads, cloths, paper towels, floor sweepings and protective clothing. These items make up about 95 percent of the total non-fuel waste volume.

Low level waste at the WWMF is handled by trained personnel to process for volume reduction or to store as is.

Low level waste from the Bruce, Pickering and Darlington nuclear generating stations is received at the Waste Volume Reduction Building at the WWMF where it may be processed through either incineration or compaction to reduce its volume or to be stored as is. Following processing, the low level waste is placed into above-ground concrete warehouse-like structures called Low Level Storage Buildings. About 3000 m^3 of low level waste is stored annually (just over the volume of an Olympic swimming pool). Storage for refurbishment waste (fuel channel waste and steam generators) from the Bruce reactors is also provided at the WWMF. The WWMF has about 70,000 m^3 (25 Olympic swimming pools) of low level waste in storage as of 2009.

Intermediate level waste

Intermediate level waste consists primarily of used reactor core components and resins and filters used to keep reactor water systems clean. Intermediate level waste is more radioactive than low level waste and requires shielding to protect workers during handling.

Intermediate level waste, because of its radiological and physical properties, is not processed for volume reduction. It is stored mainly in steel lined concrete containers that have been set into the ground. About 290 m^3 of intermediate level waste is stored annually and in total about 9000 m^3 (three and a half Olympic swimming pools) is in storage as of 2009. Intermediate level waste makes up about five percent of the total volume of non-fuel waste produced from the nuclear generating stations.

Low and intermediate level waste stored at the WWMF is continually monitored to ensure the integrity of the storage containers and can be retrieved at some future date for transfer to a long-term storage facility. The WWMF will continue to add storage structures as required (subject to applicable regulatory approvals). OPG is currently in the planning stages of a Deep Geologic Repository for the long-term storage of low and intermediate level waste at the Bruce site.

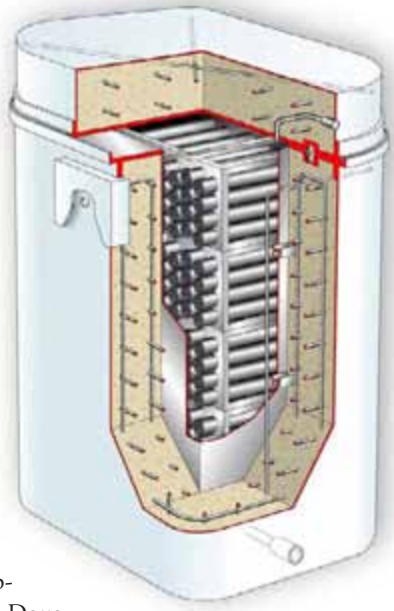
Ontario Power Generation employees carefully lower intermediate level waste into an in-ground storage container.

Used nuclear fuel

Used nuclear fuel, sometimes called high level waste because it is much more radioactive, is stored at the nuclear station site where it was generated. It is stored in the station's spent fuel bay, within the station, for at least 10 years. After that time it can be transferred to above-ground storage containers.

At the Western Waste Management Facility location, only used fuel from the Bruce Power stations is stored at the interim used fuel dry storage facility. The facility consists of a processing building and storage buildings. This facility went into operation in 2002 and is designed to provide storage space for about 2000 Dry Storage Containers (DSC). The overall Western Used Fuel Dry Storage Facility (WUFDSF) design includes four DSC storage buildings, each having the capacity to store about 500 containers. Two buildings have been commissioned (2002 & 2007) and construction of future storage buildings will be staged as additional space is required, with a new storage building built about every four to seven years.

Dry storage is a proven technology in use around the world. In Canada, dry storage is used by Hydro Quebec at Gentilly, New Brunswick Power at Point Lepreau and Atomic Energy of Canada at Chalk River and Douglas Point (located at the Bruce site). In addition to the facility at WWMF, OPG also operates dry storage facilities at the Pickering and Darlington nuclear sites.



Each dry storage container (DSC) is made of reinforced high-density concrete approximately 510 mm (20 inches) thick and is lined inside and outside with 12.7 mm (half inch) thick steel plate. This thickness of concrete provides an effective barrier against radiation.

Used nuclear fuel bundles are cooled in the station's spent fuel bay for a period of at least 10 years before being transferred.

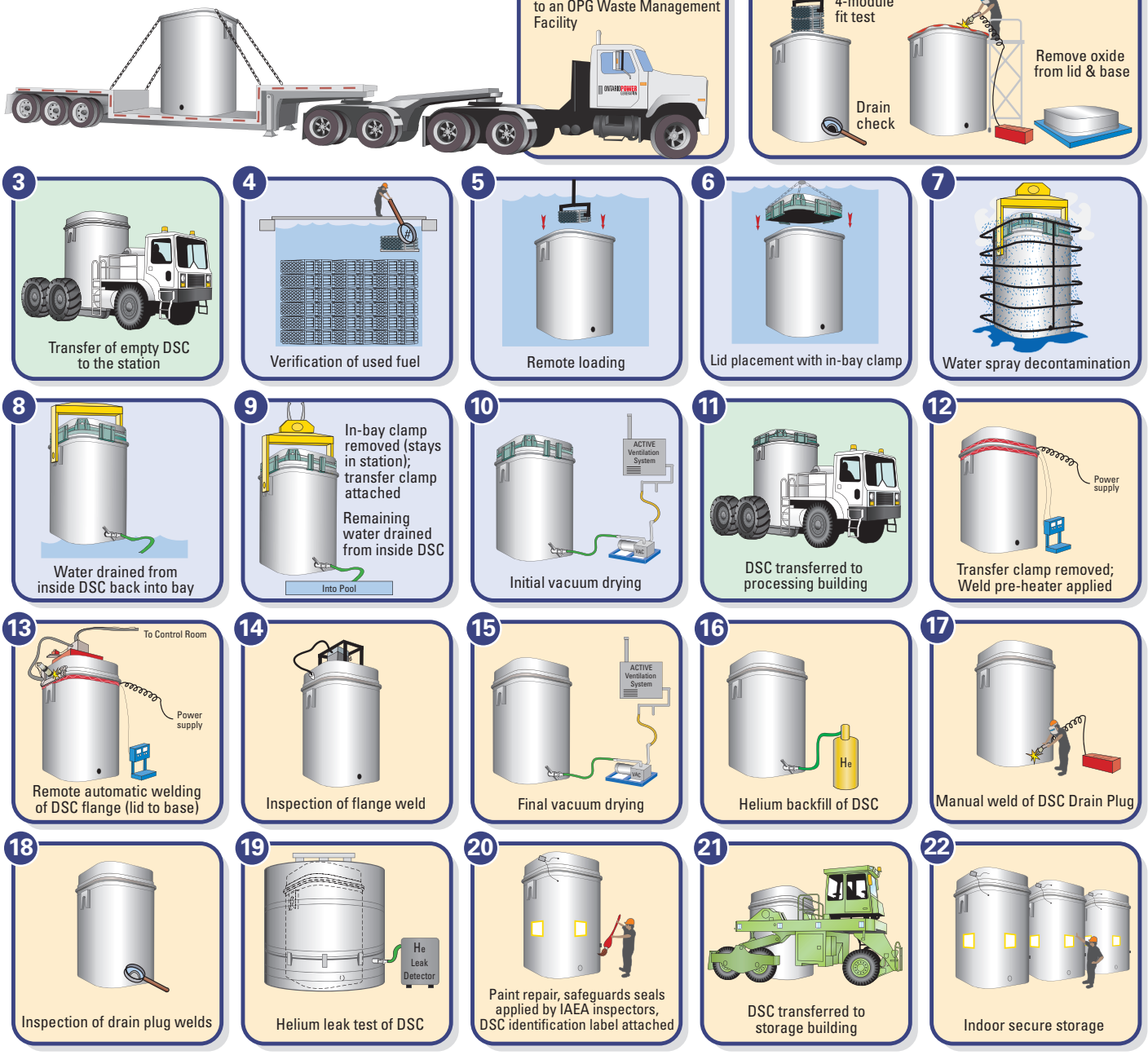
Dry storage process

The process of loading a dry storage container with used nuclear fuel begins first by submerging a 63-tonne container into one of Bruce Power's water-filled used fuel storage bays. Once in the storage bay, four modules each containing 96 used fuel bundles are loaded into the container under water. The used fuel bundles have been stored in the water-filled bay for at least 10 years, during which time they have cooled and become less radioactive.

The container, now holding 384 used fuel bundles, is removed from the bay and drained, decontaminated and vacuum dried. A transfer clamp secures the lid to the container which is moved to the dry storage facility with a large transport vehicle. Once received, the lid is welded to the container's base and the vent port is seal-welded. After the inside of the container has been vacuum dried, it is filled with helium gas. The remaining drain port is then seal-welded. The helium gas provides a means of leak detection for the sealed container and creates an inert atmosphere for the storage of used fuel. Before being placed into storage, the container undergoes rigorous testing to ensure that it is absolutely leak tight, and lastly, safeguard seals are applied by an inspector from the International Atomic Energy Agency (IAEA).

After weld-sealing, painting and installation of the International Atomic Energy Agency safeguard seals, the dry storage containers are placed in the storage building.

The used fuel dry storage process



Operations at the Waste Management Facility (WMF)

Operations at the Nuclear Generating Station (NGS) used fuel storage bay area

Transfer operations between NGS and WMF

Radioactive material transportation

A record of safety

OPG has an exceptional safety record in the transportation of radioactive materials by road. In almost 40 years, there has never been a release of radioactive materials during transportation. Our drivers are some of the best trained in their field. OPG ensures that they have high-level defensive driving training.

In a typical year OPG makes about 750 radioactive material shipments, covering about 500,000 kilometres. Shipments (roughly 23 percent) involve the transportation of low and intermediate level waste to the WWMF. A smaller number (roughly 13 percent) involve transporting tritiated heavy water from Bruce and Pickering to the Darlington Tritium Removal Facility for processing and remaining shipments involve the transportation of empty packages to and from different nuclear stations.

All of these shipments are logged into an OPG computerized database. This program logs information about the type of material being transported, point of origin, destination, etc.

Built for safety

Many different types of packaging are used to transport radioactive materials. All of the transport packages are built to requirements specified by the Canadian Nuclear Safety Commission. For example, the intermediate level waste transportation packages used for shipping spent resins and tritiated heavy water are built to Type B standards. According to federal regulations all Type B packages must be able to withstand a nine-metre drop onto an unyielding surface; a one-metre drop onto a steel pin; 30 minutes in an 800 degree celsius fire; and eight hours immersed in 15 metres of water. Only after field testing and/or computer analysis has demonstrated the packages can survive these tests will a licence to use the packaging be issued by the Canadian Nuclear Safety Commission.

OPG's radioactive material transportation program is further supported by:

- **Regular audits and safety assessments of transportation practices**
- **An ongoing training program**
- **Routine package inspection and maintenance, and**
- **A transportation emergency response plan that is audited both internally and externally by authorities like Transport Canada.**

Radioactive materials transportation is also regulated by Transport Canada's Transportation of Dangerous Goods Regulation. These regulations specify the documentation and administrative requirements in order to transport radioactive material on public roadways. The documentation must include specification of the contents on the shipping document, the labeling and placarding requirements, driver training requirements and an approved transportation emergency response plan.

Commitment to the future

OPG has an obligation to plan for the eventual decommissioning of our nuclear facilities including the Bruce Power leased reactors, and the long-term management of our nuclear wastes. OPG makes annual contributions to special funds dedicated solely for this purpose.

Our partnership with the Municipality of Kincardine to develop a Deep Geologic Repository for low and intermediate level waste on the Bruce site was endorsed by the community in 2005 and is now entering the rigorous environmental assessment stage, led by the Nuclear Waste Management Organization.

OPG has made a significant contribution to the Nuclear Waste Management Organization, which has recommended Adaptive Phased Management to the Federal government for the long-term management of used nuclear fuel in Canada, and endorsed in 2007.

Communicating our program

Although we are proud of our contributions to these initiatives, there is nothing we value more than our relationship with the people of Ontario. The safe storage of nuclear waste is done in a very transparent manner and OPG provides information in a variety of methods on nuclear waste management to the public.

For more information on our activities visit www.opg.com or call 519-361-6414 ext. 2764.

The deep geologic repository

for OPG's low and intermediate level waste

A long-term storage solution

Ontario Power Generation (OPG) has contracted the Nuclear Waste Management Organization (NWMO) to seek regulatory approval for construction of a proposed Deep Geologic Repository (DGR). This DGR, for the long-term management of low and intermediate level radioactive waste will be constructed on lands adjacent to OPG's Western Waste Management Facility (WWMF) on the Bruce nuclear site in the Municipality of Kincardine.

For over 40 years the WWMF has safely stored low and intermediate level waste from the Bruce, Pickering and Darlington nuclear sites on an interim basis. In 2002 the Municipality of Kincardine approached OPG to jointly review options for a long-term storage facility for low and intermediate level radioactive waste at the Bruce site.

An Independent Assessment Study identified three options deemed to be technically feasible and capable of safely storing the waste: the Deep Geologic Repository (DGR), Enhanced Processing, Treatment and Long-Term Storage and Covered Above-Ground Concrete Vault. In 2004 the Municipality of Kincardine by resolution endorsed moving forward with the DGR because of its higher safety margins.

The proposed DGR would manage about 160,000 cubic metres of low and intermediate level waste in underground emplacement rooms.

Only low and intermediate waste from OPG's Bruce, Pickering and Darlington generating stations will be accepted for storage in the DGR. Used fuel will not be stored in the DGR.

Committed to safety

The stability and predictability of the rock formations, along with their isolating capabilities, make an ideal setting where the waste can be safely stored while the radioactivity decays.

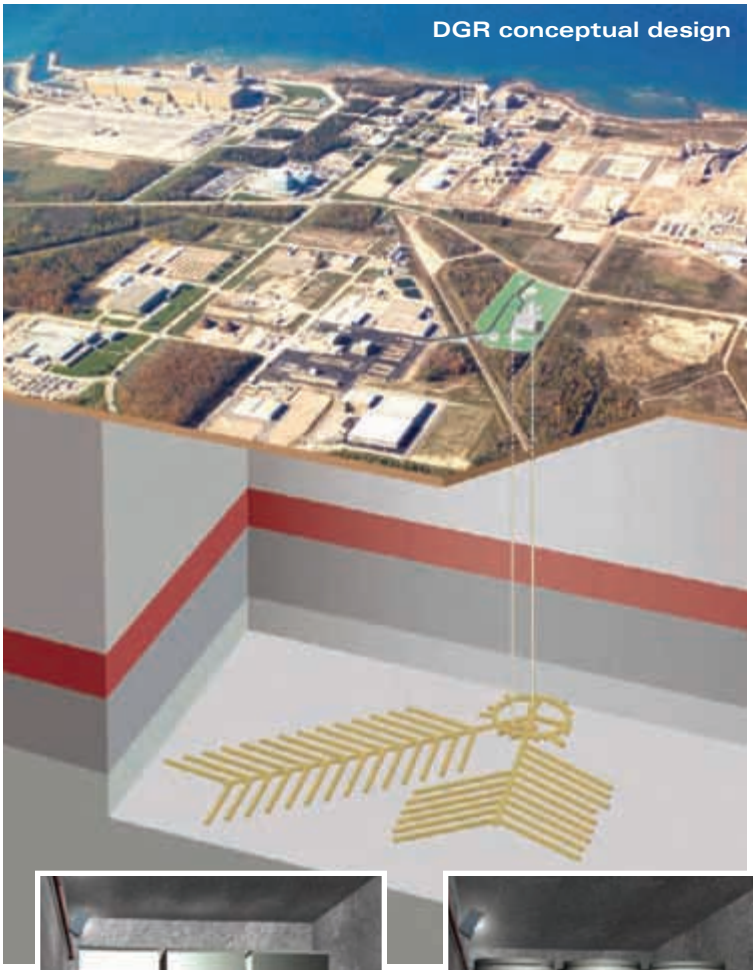
The proposed DGR location, 680 metres (2,230 feet) underneath the Bruce site, will be constructed in low permeability limestone capped by 200 metres of low permeability shale. These rock formations, thought to be in excess of 450 million years, have remained intact and without major faults or fractures through many geologic events.

In addition, the DGR is extremely isolated from all sources of groundwater, and the pore water at the level of the repository has a salt content more than eight times that of sea water indicating that it has been trapped at this level in excess of one million years. The salt content is also an indication that the pore water isn't mixing with the groundwater above.

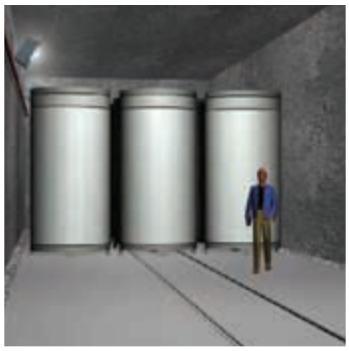
Verifying the site

A detailed four-year Geoscientific Site Characterization Program (GSCP) began in 2006 to verify the suitability of the DGR site. This scientific investigation, along with the information gained from environmental field studies, safety assessment and engineering/design, will assist in obtaining the necessary construction and operating licences from the Canadian Nuclear Safety Commission.

Formal environmental assessment and licensing processes began in 2005 and are expected to take six to eight years, with a public hearing to take place around 2012. Throughout this time period, there will be many opportunities for Kincardine and surrounding communities to learn more and to express their views on the proposed DGR.



Low level waste room



Intermediate level waste room

Recycled
Supporting responsible use of forest resources
www.fsc.org Cert no. SCS-COC-004789
© 1996 Forest Stewardship Council
Design, print, distribution: OPG Office Services

For more information please visit www.nwmo.ca/dgr or www.opg.com/dgr

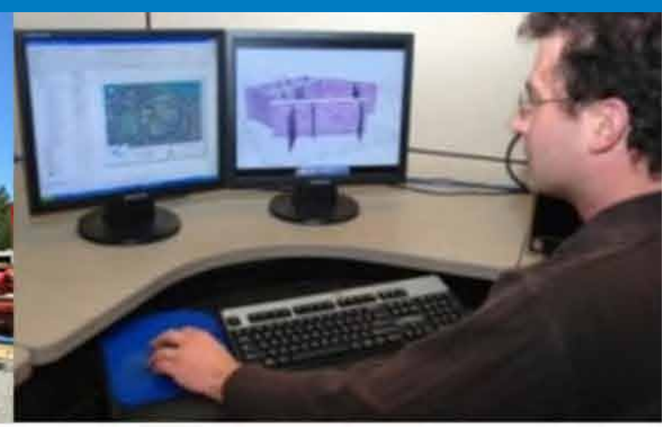
Appendix D

Open House Display Panels

OPG'S DEEP GEOLOGIC REPOSITORY FOR LOW & INTERMEDIATE LEVEL WASTE







WELCOME

KEEPING YOU INFORMED

WHY WE ARE HERE:

- Share information about Ontario Power Generation's proposed Deep Geologic Repository Project
- Provide an update on the status of work in support of the regulatory approvals process
- Answer your questions and obtain your feedback

WHO WE ARE:

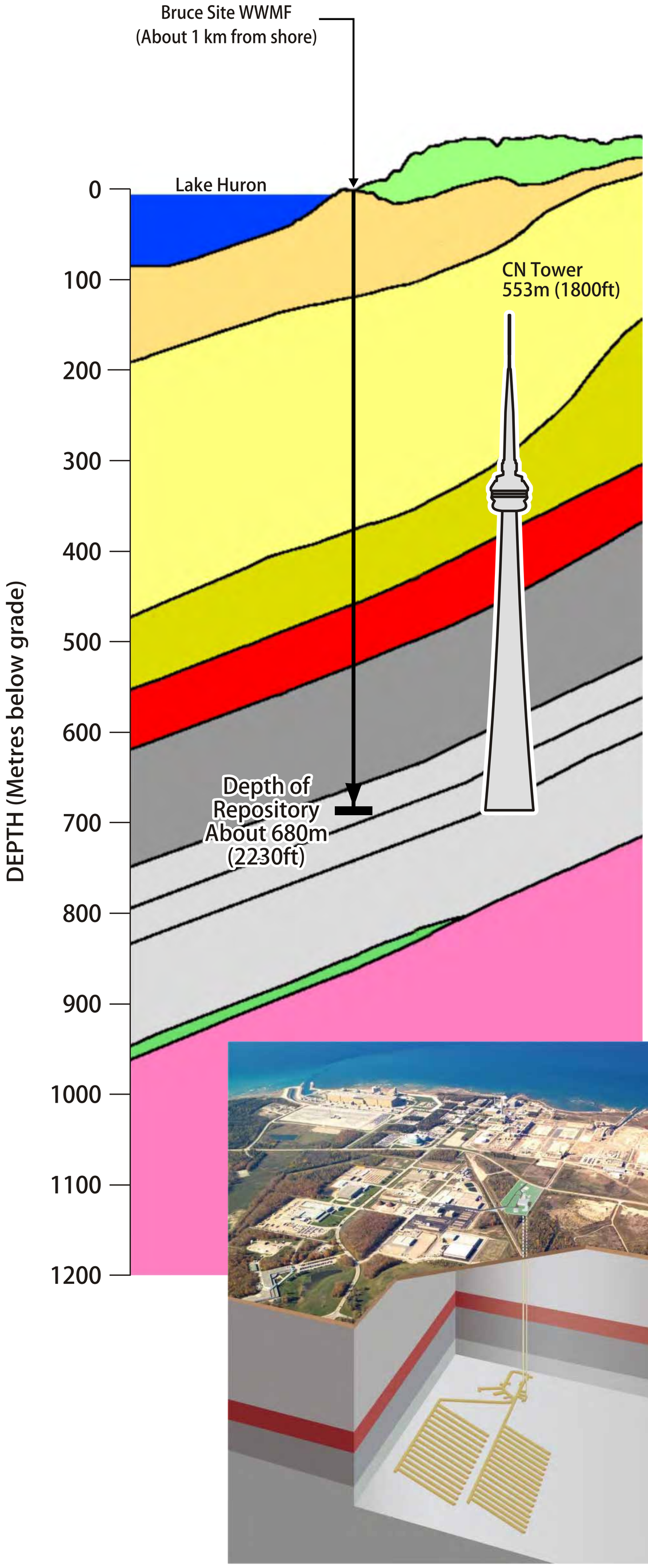
- Ontario Power Generation (OPG) operates the Western Waste Management Facility and is the owner, licensee, and operator of the DGR
- The Nuclear Waste Management Organization (NWMO) has been contracted by OPG to seek regulatory approval for the DGR

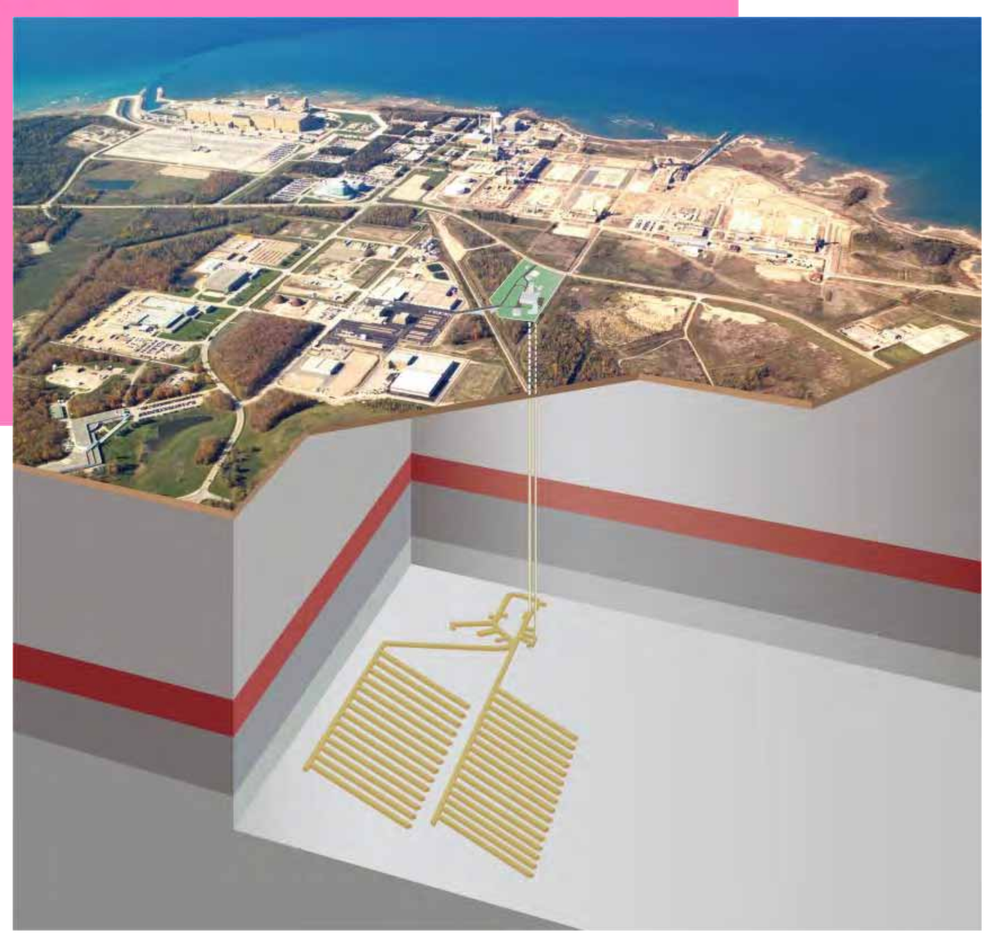
nwmo
NUCLEAR WASTE MANAGEMENT ORGANIZATION
SOCIÉTÉ DE GESTION DES DÉCHETS NUCLÉAIRES

ONTARIO POWER GENERATION

OPG'S DEEP GEOLOGIC REPOSITORY FOR LOW & INTERMEDIATE LEVEL WASTE

AN OVERVIEW OF THE PROPOSED DEEP GEOLOGIC REPOSITORY





OPG, with the support of the local municipality, has proposed the construction and operation of a Deep Geologic Repository (DGR) for the long-term management of low and intermediate level nuclear waste on lands adjacent to the Western Waste Management Facility (WWMF) in Kincardine, Ontario.

The DGR would be located about 680 metres or 2,230 feet below ground surface in low permeability limestone, beneath a very thick layer of low permeability shale, both more than 450 million years old. These sedimentary bedrock formations will safely isolate and contain nuclear waste for many thousands of years and beyond.

The proposed repository will be composed of a series of emplacement rooms. Conventional mining methods will be used to construct the repository. Access to the DGR and emplacement rooms will be by vertical shafts.

Key Features

- Proposed depth is about 680 metres (2,230 feet) within low permeability limestone – deeper than the CN Tower is tall
- Capacity of 160,000 cubic metres (m^3) of waste (200,000 m^3 with packaging)
- Located beneath a protective 200 metre (650 feet) cap of low permeability shale
- Repository access shafts will be sealed with clay-based, asphalt, and concrete materials
- Located adjacent to OPG's existing Western Waste Management Facility on the Bruce site

nwmo
NUCLEAR WASTE MANAGEMENT ORGANIZATION
SOCIÉTÉ DE GESTION DES DÉCHETS NUCLÉAIRES

ONTARIO POWER GENERATION

OPG'S DEEP GEOLOGIC REPOSITORY FOR LOW & INTERMEDIATE LEVEL WASTE

THE FACTS ABOUT NUCLEAR WASTE

What is Low Level Waste?

Low level waste (LLW) consists of minimally radioactive materials that have become contaminated during routine clean-up and maintenance at nuclear generating stations.

Low level waste:

- Includes mop heads, cloths, paper towels, temporary floor coverings, floor sweepings, protective clothing and hardware items such as tools
- Consists of paper, plastics, metal, rubber, cotton and other miscellaneous materials
- Can be safely handled using normal industrial practices and equipment without any special radiation protection
- Makes up about 95 percent of the total non-fuel waste volume received at OPG's Western Waste Management Facility (WWMF)

About 3,000 cubic metres of low level waste is stored annually at the WWMF. The majority of low level waste volume is incinerated or compacted for volume reduction before it is placed in concrete warehouse-like buildings for interim management.

Low level waste

Intermediate Level Waste Storage

What is Intermediate Level Waste?

Intermediate level waste (ILW) consists primarily of used reactor core components, and resins and filters used to keep reactor water systems clean, and reactor retube parts such as pressure tubes.

Intermediate level waste:

- Requires shielding to protect workers during handling
- Is not processed for volume reduction
- Makes up approximately five per cent of all non-fuel waste received at the Western Waste Management Facility – approximately 200 cubic metres each year
- Is stored mainly in steel-lined concrete containers set into the ground

nwmo
NUCLEAR WASTE MANAGEMENT ORGANIZATION
SOCIÉTÉ DE GESTION DES DÉCHETS NUCLÉAIRES

ONTARIO POWER GENERATION

OPG'S DEEP GEOLOGIC REPOSITORY FOR LOW & INTERMEDIATE LEVEL WASTE

WASTE INVENTORY

The low and intermediate level waste to be emplaced in the DGR is comprised of a variety of materials from operation and maintenance and refurbishment of OPG-owned nuclear stations. The information below summarizes the overall waste composition, the various waste containers, and the total waste radioactivity.

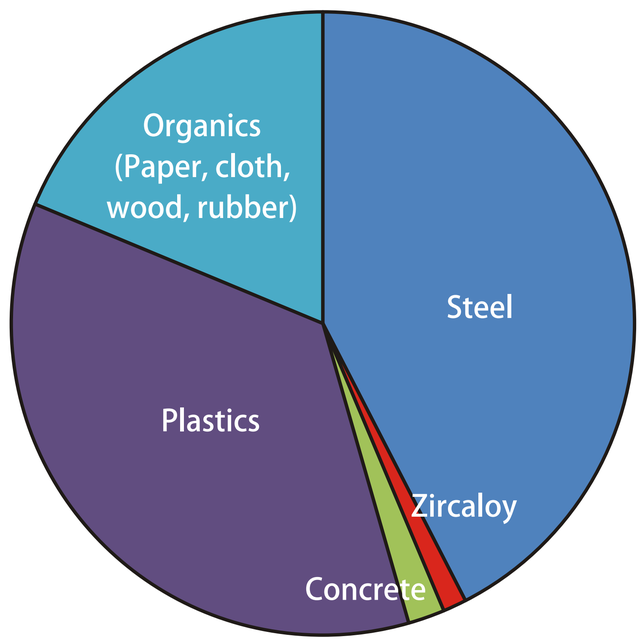
Initial amount of most abundant radionuclides

Radionuclide	Initial Amount (kg)	Halflife (years)
Zr-93	2000	1,530,000
Nb-94	600	20,300
C-14	40	5,730
U-238	30	4,468,000,000
Ni-59	10	75,000
Cl-36	1	301,000
Pu-239	0.2	24,000
Pu-240	0.08	6,500
Se-79	0.07	300,000
I-129	0.03	15,700,000
H-3	0.004	12

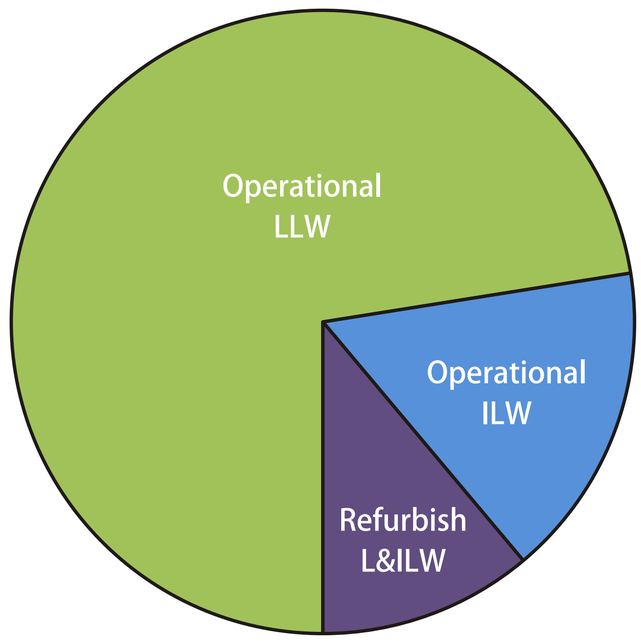
Approximate number of waste containers

	Number of Containers
Low-Level Wastes	
Incinerator ash	1,000
Compacted wastes	7,000
Non-processible wastes (used equipment)	27,000
Water cleanup IX resins and sludges	4,000
Steam generator segments	500
Sub-total LLW	39,000
Intermediate-Level Wastes	
Water cleanup IX resins	2,000
Water filters, core components, used equipment	8,000
Retube wastes (e.g. pressure tubes)	1,000
Sub-total ILW	**11,000**
Total	**50,000**

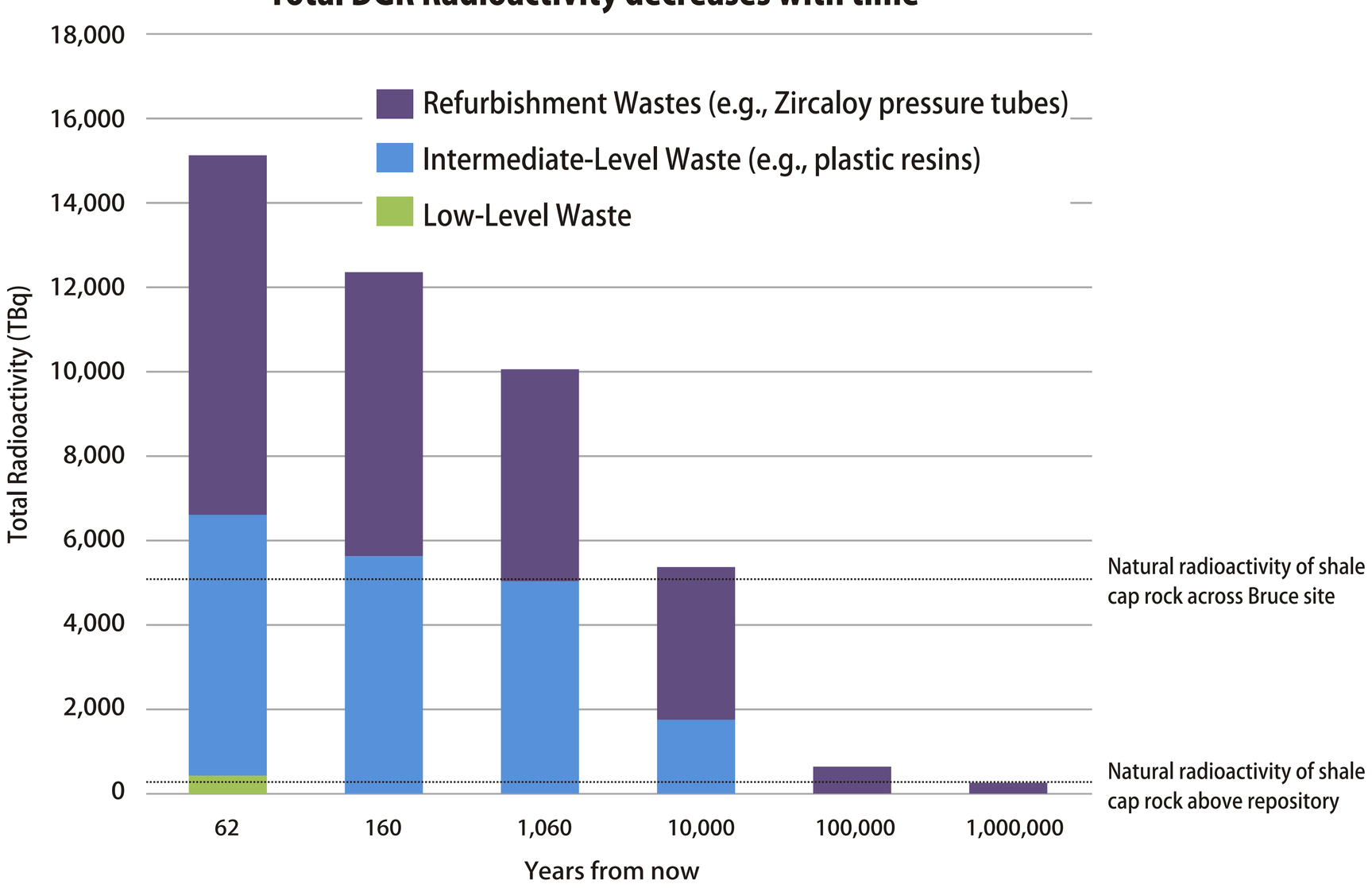
Proportional composition of waste in the DGR (by weight)



Waste volumes



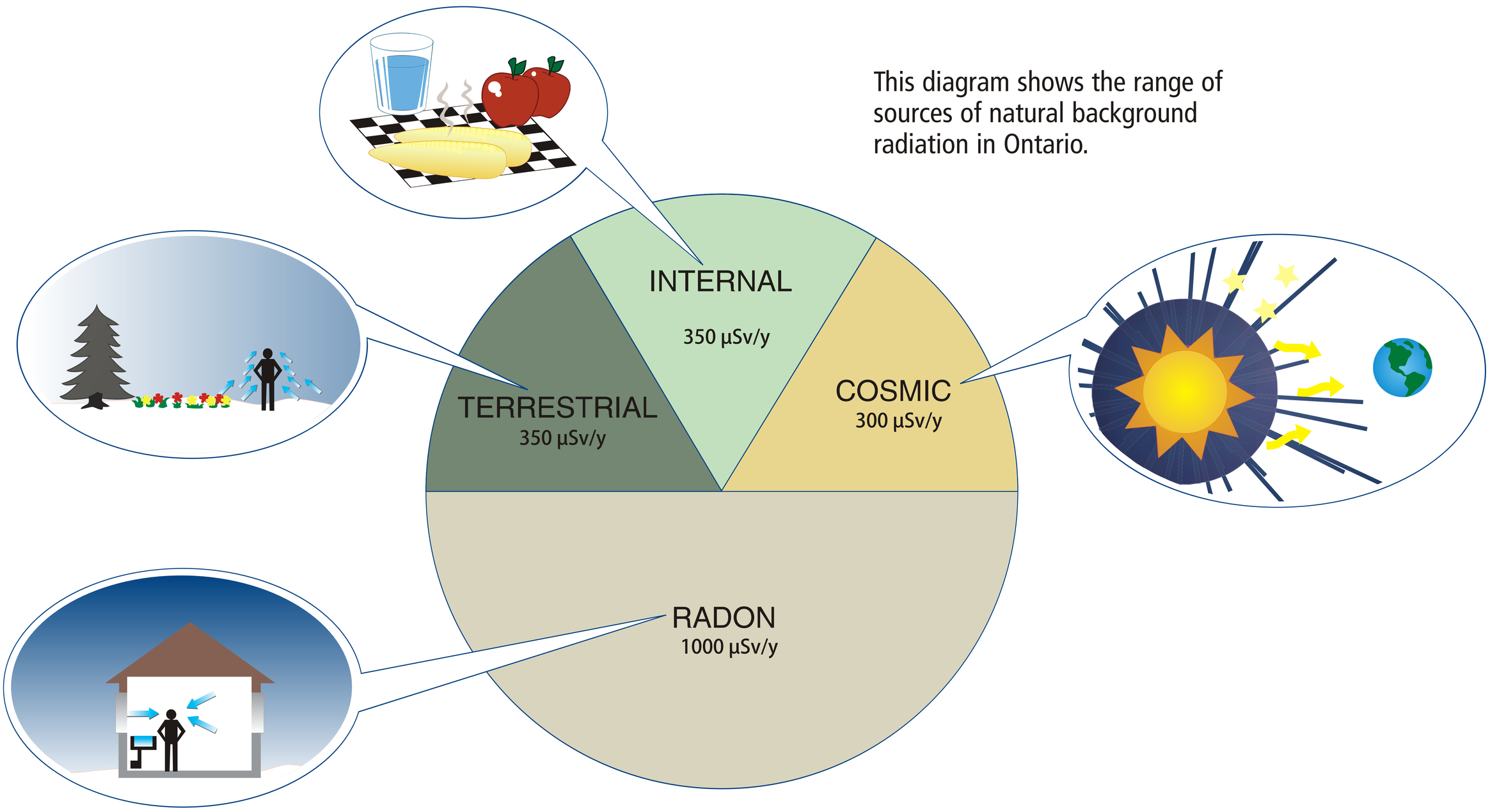
Total DGR Radioactivity decreases with time



nwmo
NUCLEAR WASTE MANAGEMENT ORGANIZATION
SOCIÉTÉ DE GESTION DES DÉCHETS NUCLÉAIRES

ONTARIO POWER GENERATION

WHAT IS RADIATION?



This diagram shows the range of sources of natural background radiation in Ontario.

Sources of Radiation in Our Environment

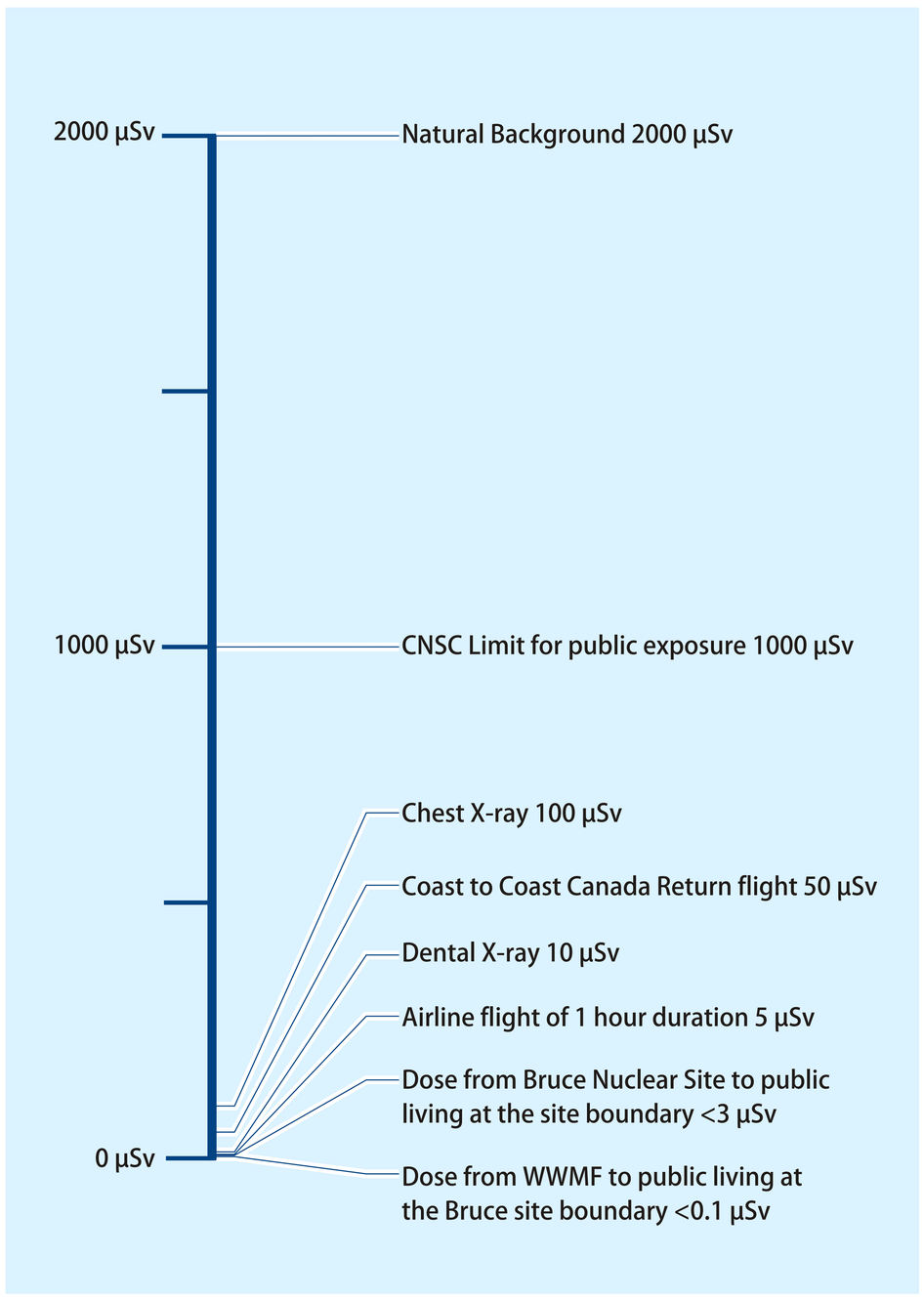
People are exposed to radiation from a number of natural sources such as the bedrock, and also from human activities such as medical examinations, smoke detectors and power generation.

Radiation dose is measured in Sieverts, and the dose of radiation received by people is often expressed in millionths of a Sievert, or microSievert (µSv). The amount of radiation that the average person in Canada is exposed to, from all natural sources, is about 2,000 µSv per year. A chest x-ray gives you about 100 µSv, a dental x-ray set about 10 µSv.

Radiation Exposure Regulations

The nuclear industry adheres to both national regulations and international recommendations. The limit for public radiation exposure from nuclear facilities is 1,000 µSv per year. For nuclear waste repositories, the International Commission on Radiological Protection recommends a dose constraint of 300 µSv per year after closure.

Results from careful monitoring of all nuclear activities at the Bruce site show that the public exposure is less than 3 µSv per year to a person living at the fenceline. Waste handling and storage at the WWMF contribute a fraction of this dose. Emplacing the waste in the DGR will also further reduce this dose after closure.

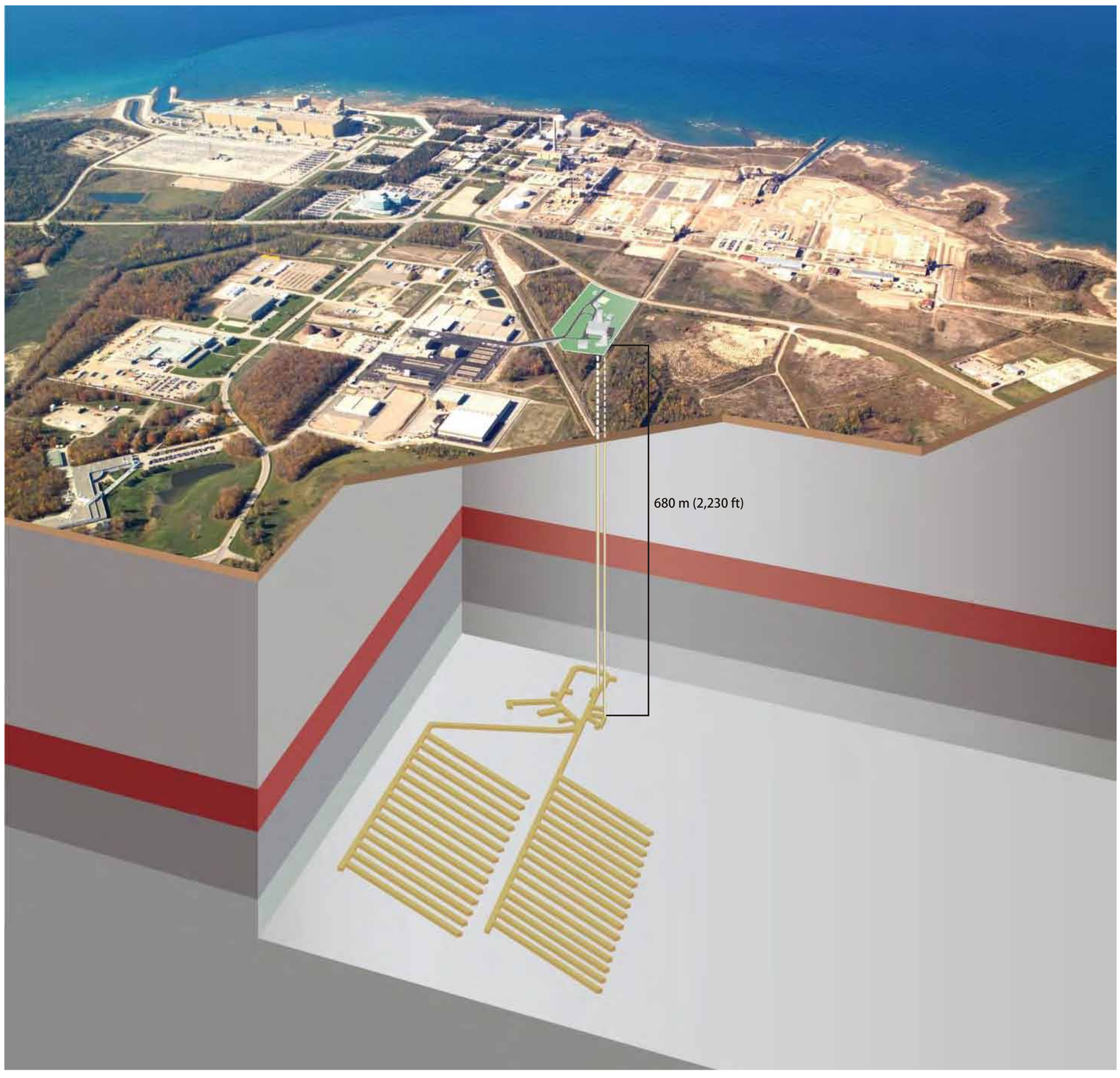


nwmo
NUCLEAR WASTE MANAGEMENT ORGANIZATION
SOCIÉTÉ DE GESTION DES DÉCHETS NUCLÉAIRES

ONTARIO POWER GENERATION

OPG'S DEEP GEOLOGIC REPOSITORY FOR LOW & INTERMEDIATE LEVEL WASTE

DGR ENGINEERING DESIGN CONCEPT



Current design philosophy includes:

- Approximate five year construction period
- On-site storage of excavated rock
- On-site retention pond for surface water runoff
- Above-ground facilities for waste receipt and hoist headframes
- Access to the repository by shaft; one shaft for personnel and waste transfer and another for ventilation
- Underground facilities for waste receipt, waste emplacement, equipment maintenance, monitoring and refuge stations in case of emergency
- Emplacement rooms constructed through the rock with shotcrete walls and ceilings, and concrete floors
- Emplacement rooms dedicated to either low or intermediate level waste
- Closure of rooms once full
- Capacity to operate for minimum 35 to 40 years
- Sealing of shafts at end of DGR life, subject to regulatory approval

nwmo
NUCLEAR WASTE MANAGEMENT ORGANIZATION
SOCIÉTÉ DE GESTION DES DÉCHETS NUCLÉAIRES

ONTARIO POWER GENERATION

OPG'S DEEP GEOLOGIC REPOSITORY FOR LOW & INTERMEDIATE LEVEL WASTE

MAJOR PROJECT WORKS AND ACTIVITIES

Site Preparation Phase

Time: Approximately six months
Work Force: Approximately 30 positions

Site preparation would begin after receipt of a Site Preparation Licence and would include clearing approximately 15 ha (37 acres) of the DGR project site and preparing the construction laydown areas.

Activities would include:

- Removal of brush and trees and transfer by truck to on-site storage
- Excavation for removal of topsoil and truck transfer to stockpile on site
- Grading of sites, including roads, construction laydown areas, stormwater management area, ditches
- Paving of roads
- Receipt and installation of construction trailers and associated temporary services
- Install and operate fuel depot for construction equipment

Construction Phase

Time: Approximately five years
Work Force: Approximately 75 positions per year average

It will include the construction of the surface facilities including the Waste Package Receipt Building, material handling, shaft headframes and all other temporary and permanent facilities at the site, as well as excavation and construction of access ways to the repository (i.e., shafts), and underground infrastructure (e.g., ventilation system, the underground excavation of the emplacement and non-storage rooms).

Activities would include:

- Excavation for and construction of footings for permanent buildings, and for site services such as domestic water, sewage, and electrical
- Construction of permanent buildings, including headframe buildings associated with main and vent shafts
- Receipt and set up of equipment for shaft sinking
- Construction of bridge/crossing over the railway ditch between WWMF and the DGR site
- Construction of electrical substation and installation of standby generators
- Construction of main and vent shafts, and access tunnels and emplacement rooms
- Placement of rock in on-site storage area
- Dewatering of the shaft construction area to an above-ground stormwater management facility
- Possible temporary day storage of small quantities of explosives underground for construction of emplacement rooms and tunnels

Front End Loader

Drill Carriage

Scaling Machine

nwmo
NUCLEAR WASTE MANAGEMENT ORGANIZATION
SOCIÉTÉ DE GESTION DES DÉCHETS NUCLÉAIRES

ONTARIO POWER GENERATION

OPG'S DEEP GEOLOGIC REPOSITORY FOR LOW & INTERMEDIATE LEVEL WASTE

MAJOR PROJECT WORKS AND ACTIVITIES

Operations Phase

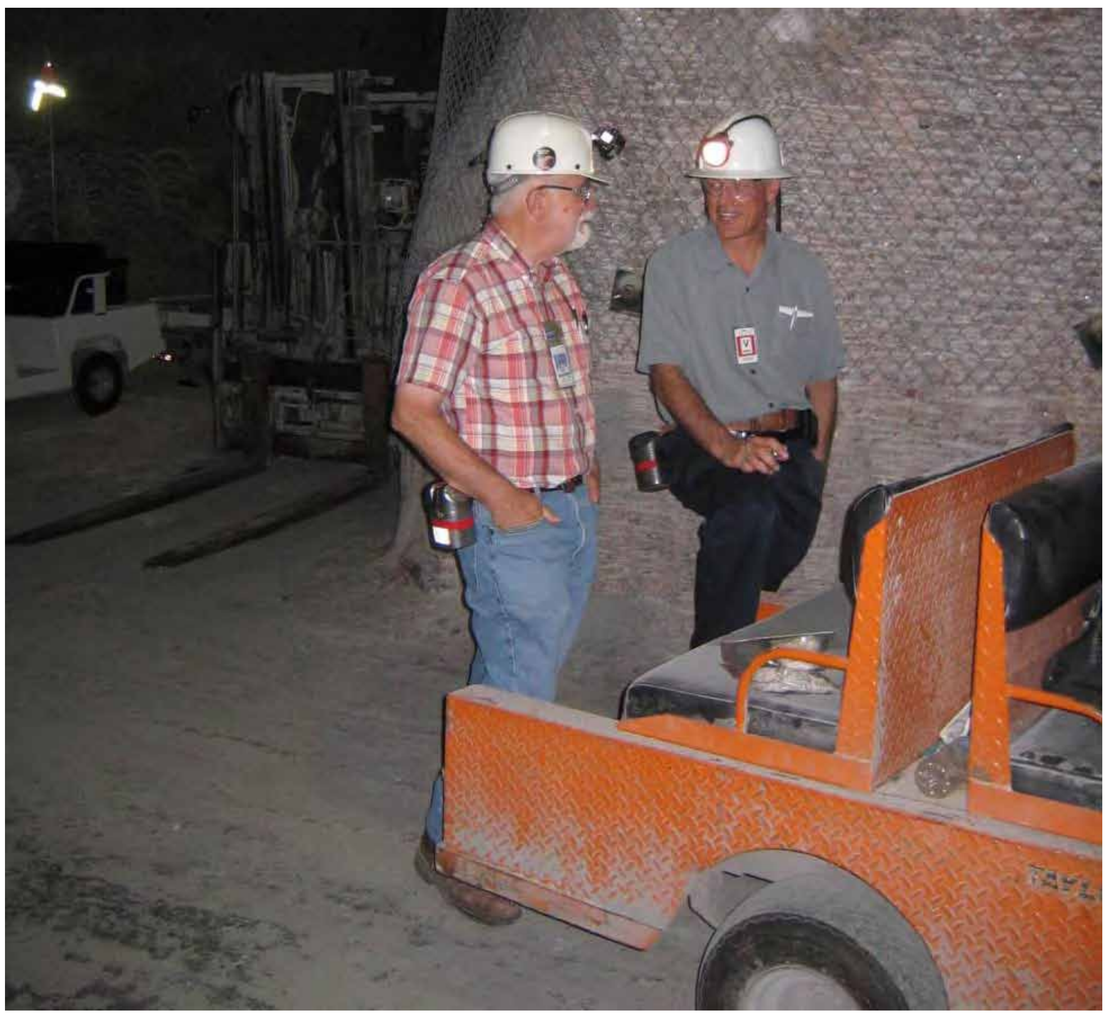
Time: Approximately 35 to 40 years
Work Force: Approximately 30 positions

The operations phase will include receipt of L&ILW from WWMF at the staging area in the DGR Waste Package Receiving Building (WPRB) and on-site transfer to shaft. Underground handling of wastes includes receipt of the waste at the repository level and transfer of the waste to the emplacement rooms.

Activities include:

- Receipt of disposal-ready waste packages from the WWMF by forklift or transport truck
- Offloading of waste packages at the DGR waste receiving building
- Handling of resin liners and placement of resin liners in shielding
- Transfer of waste packages within the WPRB by forklift
- Temporary storage of waste packages at the waste receipt building
- Administrative activities involving office space, lunch room and amenities space
- Operation and maintenance of hoists
- Receipt of waste packages at the base of the main shaft
- Offloading from cage and transfer of waste packages by forklift to emplacement rooms
- Rail cart transfer of some large packages (THE Liners, Heat Exchangers/Shield Plug Containers) to emplacement rooms
- Installation of shielding walls on full emplacement rooms
- Remedial rock bolting and rock wall scaling, as required
- Fuelling and maintenance of underground vehicles and equipment
- Receipt and storage of fuel for underground vehicles
- Maintenance of services (e.g., communications, ventilation, and fire protection systems)

Emplacement activities will be followed by a period of monitoring to ensure that the DGR facility is performing as expected prior to decommissioning.



Waste Isolation Pilot Plant in New Mexico

Precompacted Bentonite Blocks

Decommissioning Phase

Time: Approximately five years
Work Force: Approximately 75 positions

The decommissioning phase would be preceded by an environmental assessment process. If approved, the decommissioning would include removal of the surface facilities and installation of seals in each of the shafts.

Activities would include the following:

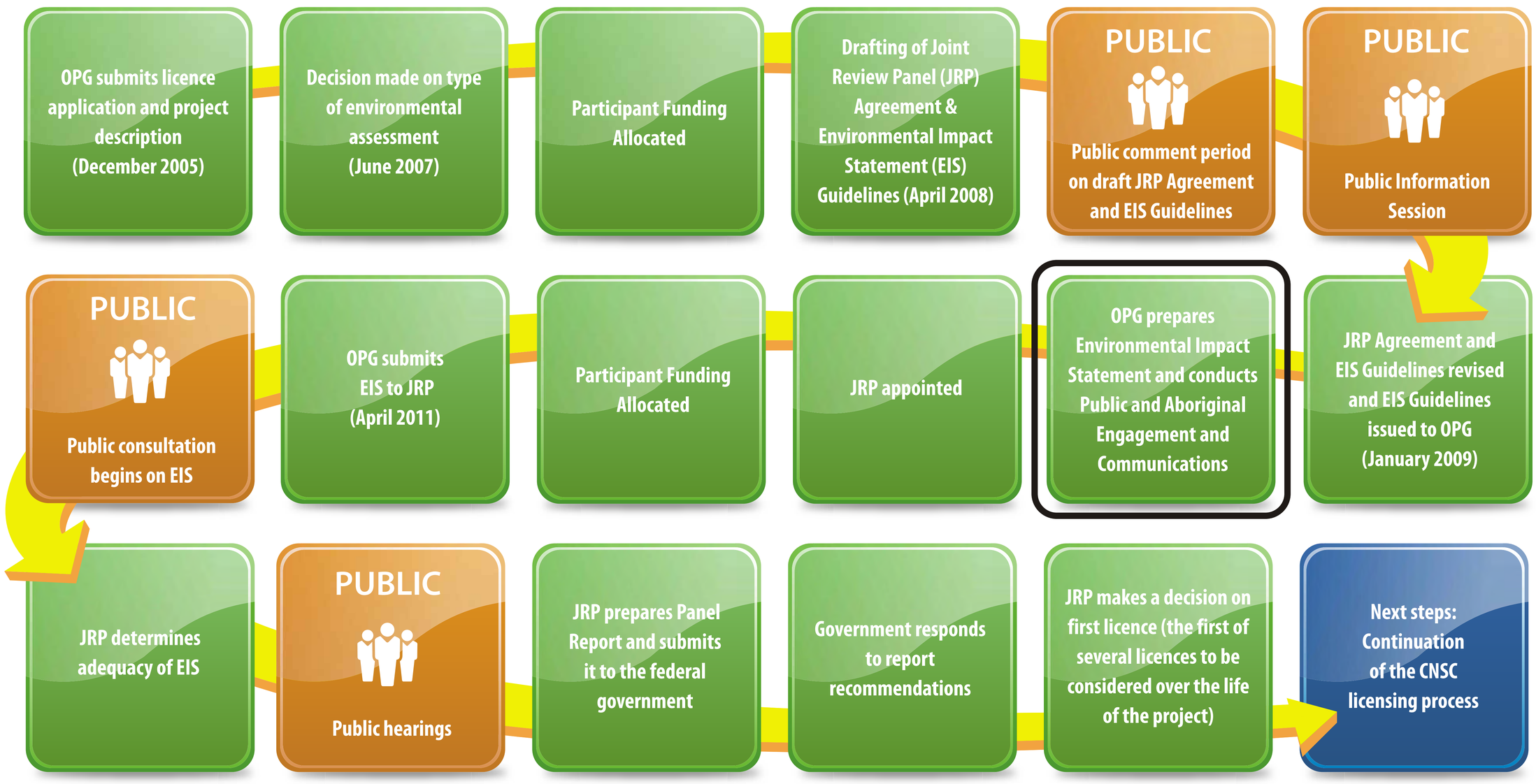
- A concrete monolith will be installed at the base of the shafts
- Shaft liner will be removed and shaft seal will be installed
- Surface structures will be removed
- Infrastructure will be disconnected and access ways will be sealed

OPG'S DEEP GEOLOGIC REPOSITORY FOR LOW & INTERMEDIATE LEVEL WASTE

ENVIRONMENTAL ASSESSMENT (EA) REGULATORY PROCESS

FEDERAL JOINT ENVIRONMENTAL ASSESSMENT PROCESS

OPG DEEP GEOLOGIC REPOSITORY



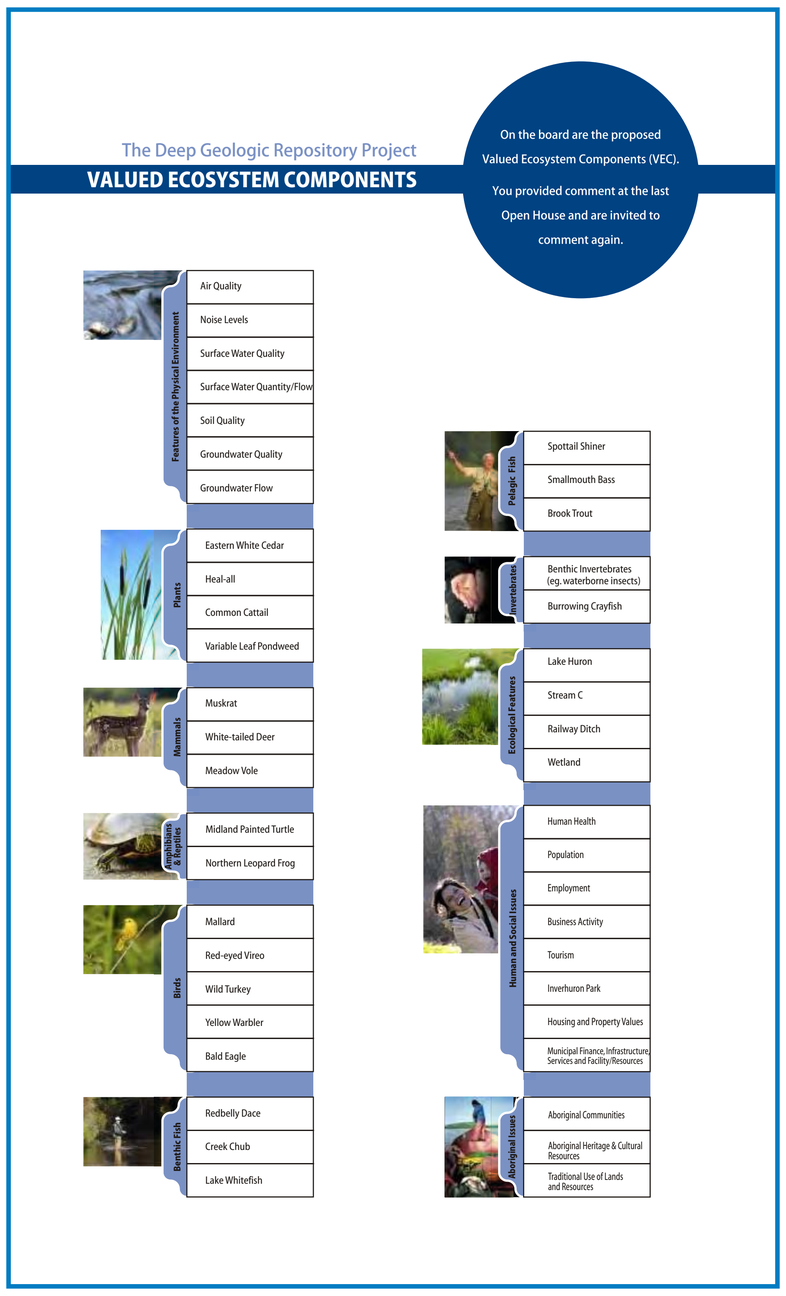
Adapted from Canadian Environmental Assessment Agency (CEAA) and Canadian Nuclear Safety Commission (CNSC).

Current Status

OPG'S DEEP GEOLOGIC REPOSITORY FOR LOW & INTERMEDIATE LEVEL WASTE

ENVIRONMENTAL ASSESSMENT METHODOLOGY

The method used for identifying and assessing the potential effects of the proposed DGR Project is:



PROJECT DESCRIPTION

ENVIRONMENTAL IMPACT STATEMENT GUIDELINES (Issued by CNSC and CEAA)

CONCEPTUAL ENGINEERING DESIGN

DEVELOPMENT OF PROJECT SCOPE

STUDY AREA IDENTIFICATION

BASELINE ENVIRONMENT CHARACTERISTICS (Including geoscientific site characterization, environmental studies and safety assessment)

VALUED ECOSYSTEM COMPONENTS (Used to assess effects on the environment, may be species or valued environmental characteristics)

IDENTIFY PROJECT-ENVIRONMENT INTERACTIONS (How do the DGR and environment interact)

ASSESS ENVIRONMENTAL EFFECTS

IDENTIFY MITIGATION MEASURES

DETERMINE RESIDUAL EFFECTS

CUMULATIVE EFFECTS

SIGNIFICANCE

EFFECTS OF ENVIRONMENT ON THE PROJECT AFTER MITIGATION

MALFUNCTIONS AND ACCIDENTS

FOLLOW UP AND MONITORING PROGRAMS

CONCLUSIONS

nwmo
NUCLEAR WASTE MANAGEMENT ORGANIZATION
SOCIÉTÉ DE GESTION DES DÉCHETS NUCLÉAIRES

ONTARIO POWER GENERATION

OPG'S DEEP GEOLOGIC REPOSITORY FOR LOW & INTERMEDIATE LEVEL WASTE

THE ROLE OF SAFETY ASSESSMENT

The role of safety assessment:

- Considers both the operating and after closure periods
- Analyses the DGR behavior under expected and abnormal conditions
- Quantifies potential impacts on public, workers and the environment
- Compares the potential impacts with regulatory criteria
- Provides feedback to help improve the site characterization and design

The Safety Assessment follows:

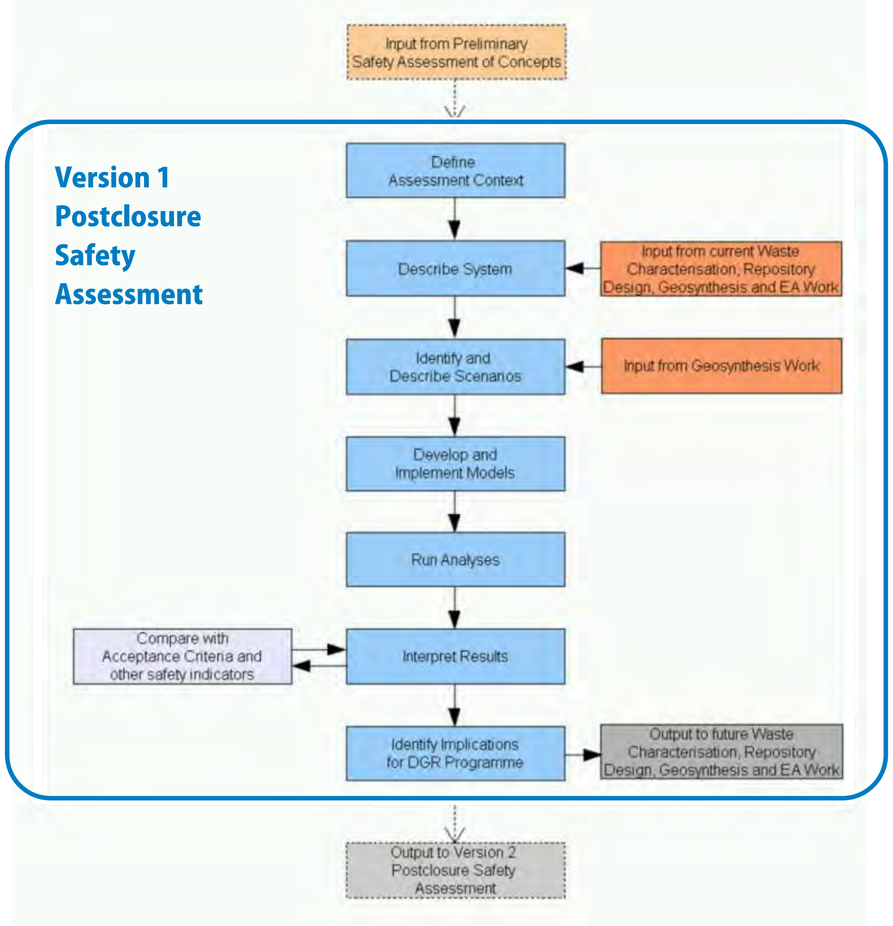
- Federal Environmental Assessment Guidelines for the DGR project
- Canadian Nuclear Safety Commission, policy and guidance, including:
  - CNSC P-290 – Managing Radioactive Wastes
  - CNSC G-320 – Assessing the Long Term Safety of Radioactive Waste Management
  - Nuclear Safety and Control Act and associated regulations
  - International best-practices

The interim "Version 1" Safety Assessment has been published, and is currently undergoing review by the regulator (CNSC) as well as international experts. To read the reports, go to www.nwmo.ca/dgrprojectdocuments.

Safety assessment is an iterative process:

Site Characterization	Waste Inventory	Design	Safety Assessment
Generic data (not site specific)	Draft inventory report	Early conceptual design	"Version 0" Initial assessment
Phase I Geosynthesis (2 boreholes)	Reference inventory report	Conceptual Design	"Version 1" Interim reports for peer review
Phase II Geosynthesis (6 boreholes)	2010 update	Preliminary Design	"Version 2" Construction license application
Construction Phase Verification	Future update	Final Design	Operating license application

We are here.



Safety Assessment follows a methodical process

OPG'S DEEP GEOLOGIC REPOSITORY FOR LOW & INTERMEDIATE LEVEL WASTE

SITE MAP

Bruce Site Borehole Locations

nwmo
NUCLEAR WASTE MANAGEMENT ORGANIZATION
SOCIÉTÉ DE GESTION DES DÉCHETS NUCLÉAIRES

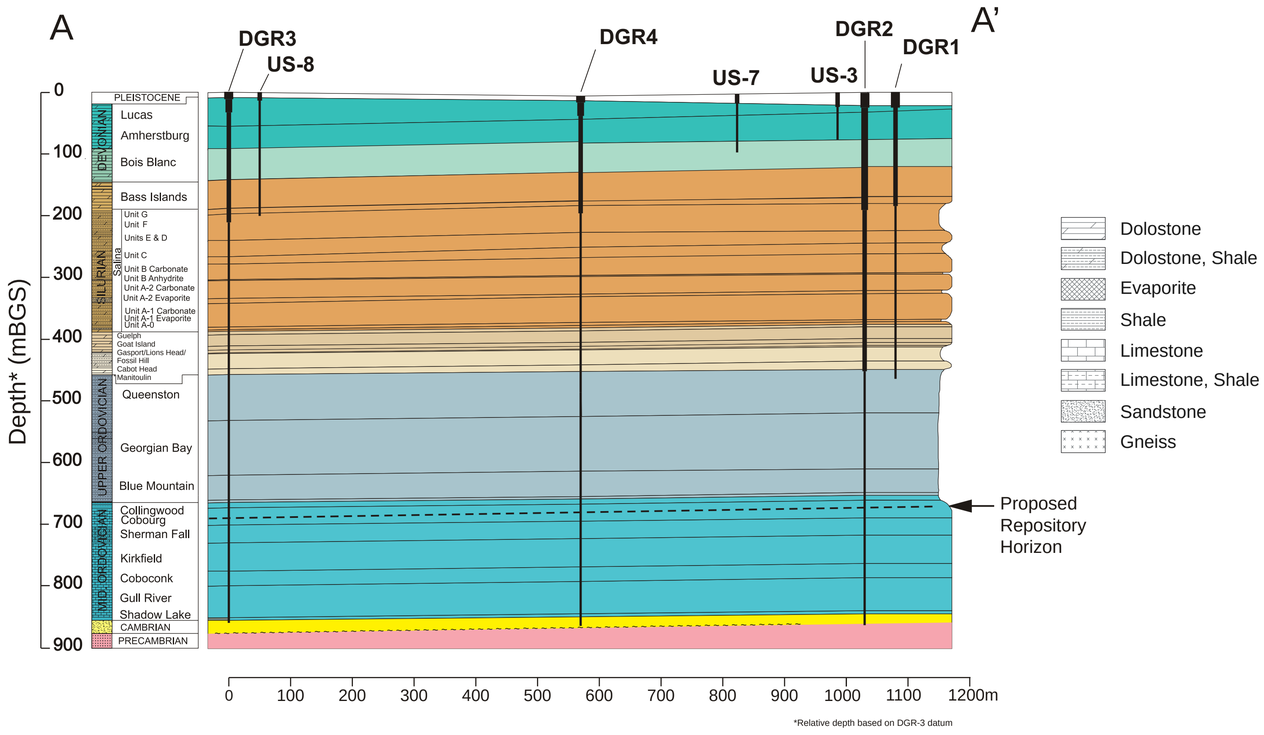
ONTARIO POWER GENERATION

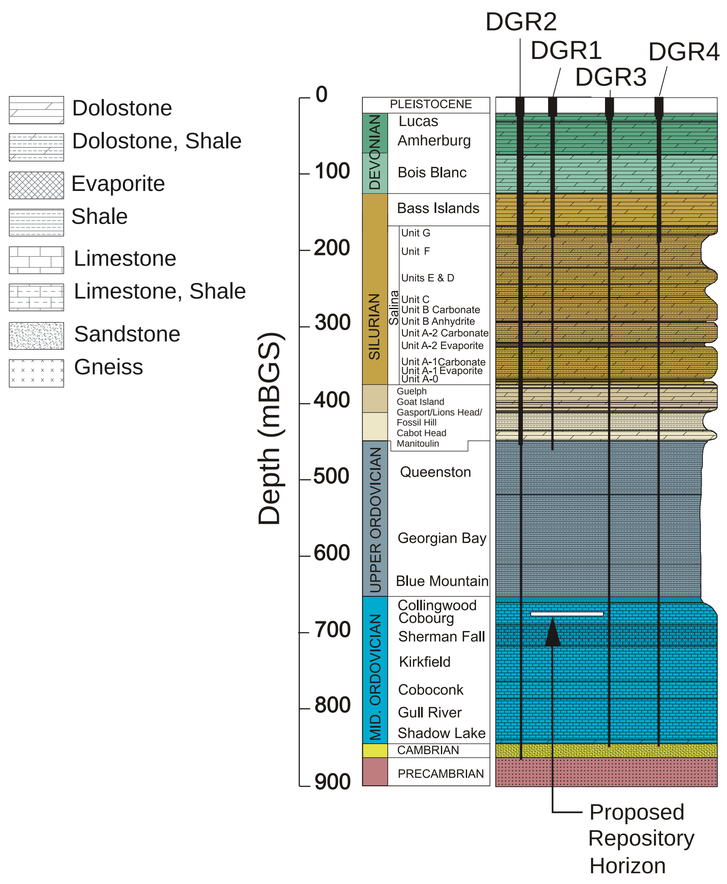
OPG'S DEEP GEOLOGIC REPOSITORY FOR LOW & INTERMEDIATE LEVEL WASTE

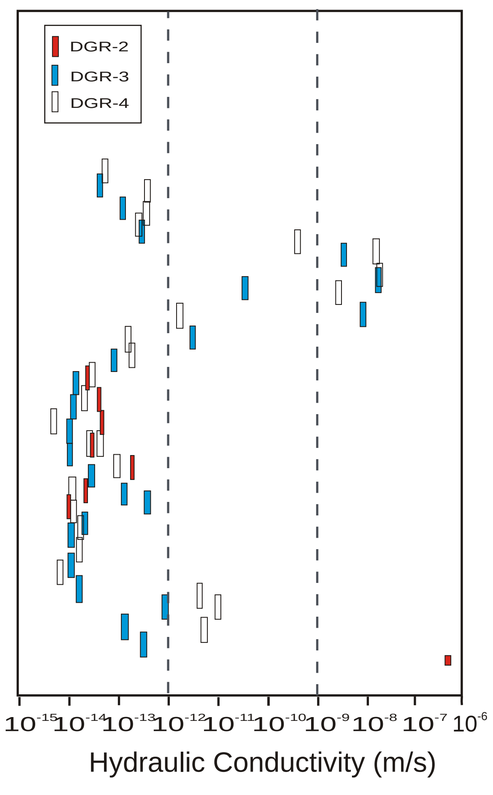
GEOSCIENCE ATTRIBUTES

PREDICTABILITY

- Borehole coring indicates a consistent bedrock 'column' beneath the Bruce site comprised of 34 individual near-horizontally layered, laterally extensive bedrock formations of Cambrian to Devonian age (543 – 350 Million yrs)
- Sedimentary bedrock layering observed beneath the Bruce site is as understood from regional geologic knowledge extending laterally for 10's of kilometres





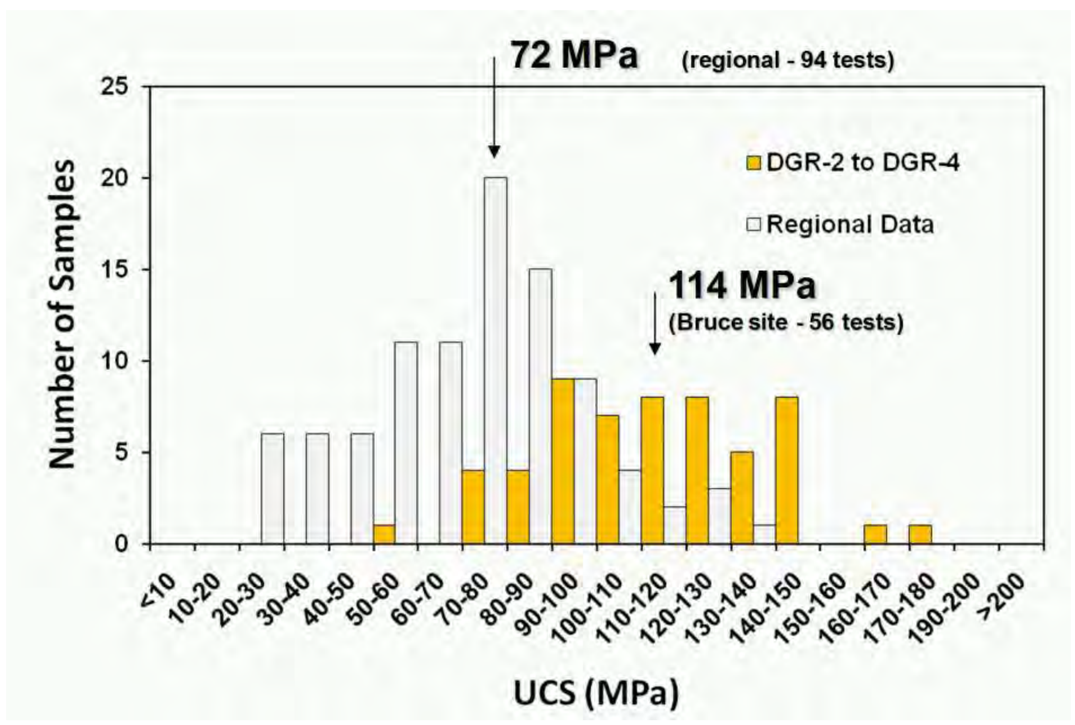


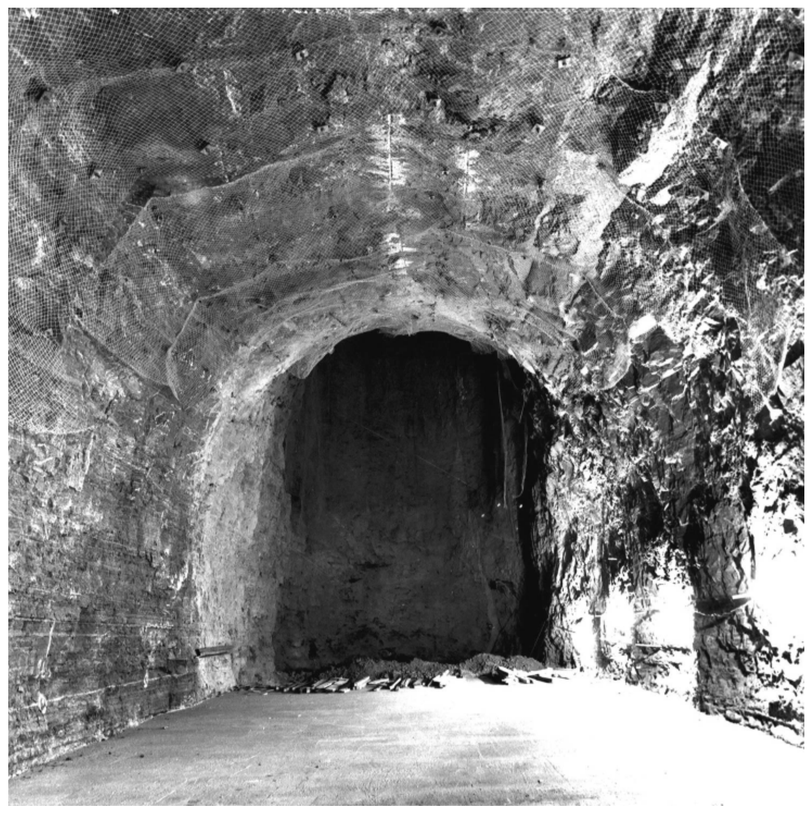
MULTIPLE NATURAL BARRIERS

- The DGR is surrounded by multiple layers of low permeability sedimentary rock. The horizon immediately above the repository is comprised of a ~200 m layer of low permeability ($\leq 10^{-13}$ m/sec) Ordovician age (450 Million yrs) shale located about 440 m below ground surface
- A sequence of shales, dolostones and evaporites comprising the Salina Formation (about 190 m thick) above the Ordovician shale possess low permeabilities

GEOMECHANICALLY STABLE

- The compressive strength of the Cobourg Formation as determined from core samples obtained during deep drilling exceeds that understood from regional experience
- DNGS's cooling water intake tunnel, which provided a stable, dry opening with minimal rock support, was excavated in the Cobourg Formation 30 m beneath Lake Ontario





Darlington (DNGS) Cooling Water Intake Tunnel

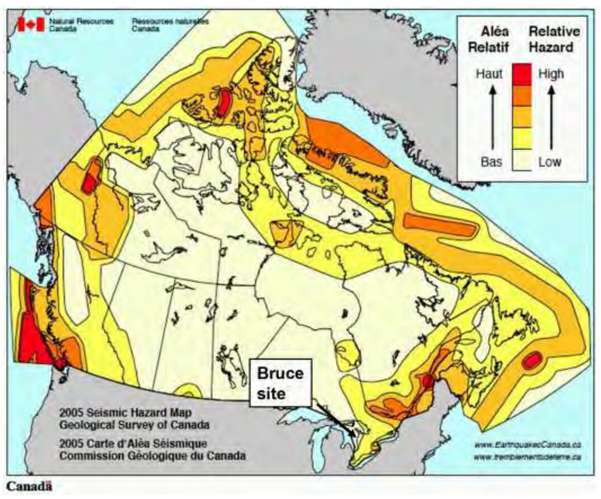
OPG'S DEEP GEOLOGIC REPOSITORY FOR LOW & INTERMEDIATE LEVEL WASTE

GEOSCIENCE ATTRIBUTES

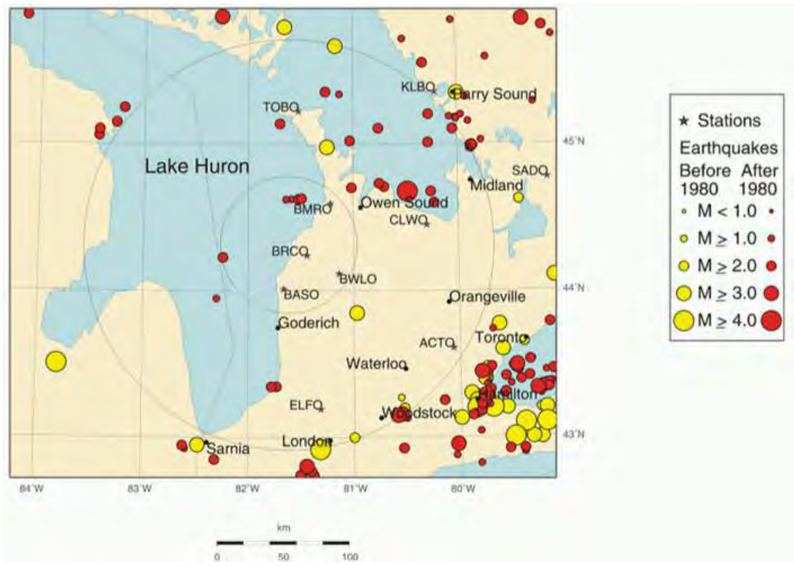
SEISMICALLY QUIET

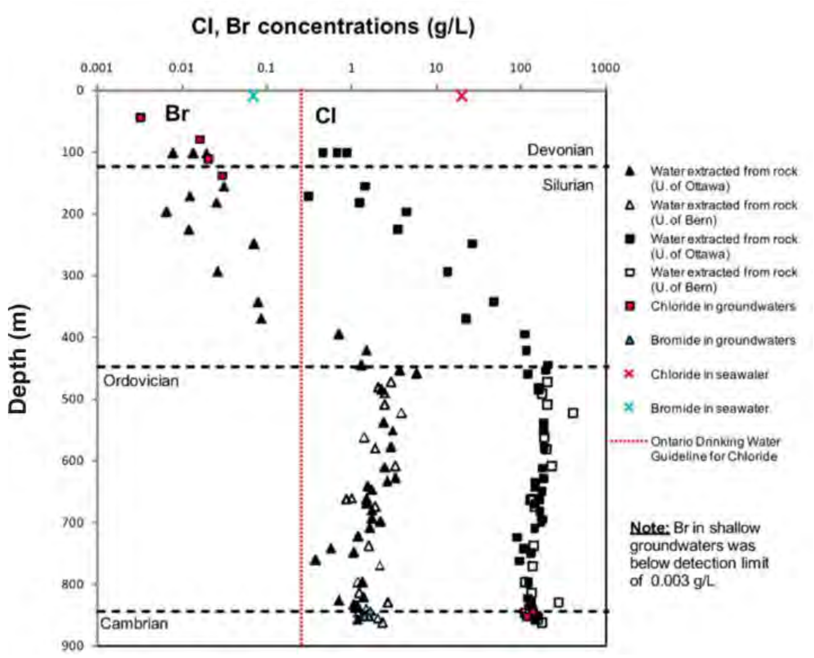
- The Bruce region is located in an area of known low Seismic Hazard consistent with that occurring on the stable Canadian Shield
- Historic records of seismic activity do not reveal events exceeding M5, within a radius of more than 150 km of the Bruce site, in the past 100 years
- The recently installed micro-seismicity monitoring network has not detected natural seismic (>M2.5) activity within a radius of 150 km of the site

SEISMIC HAZARD MAP



SEISMIC MONITORING



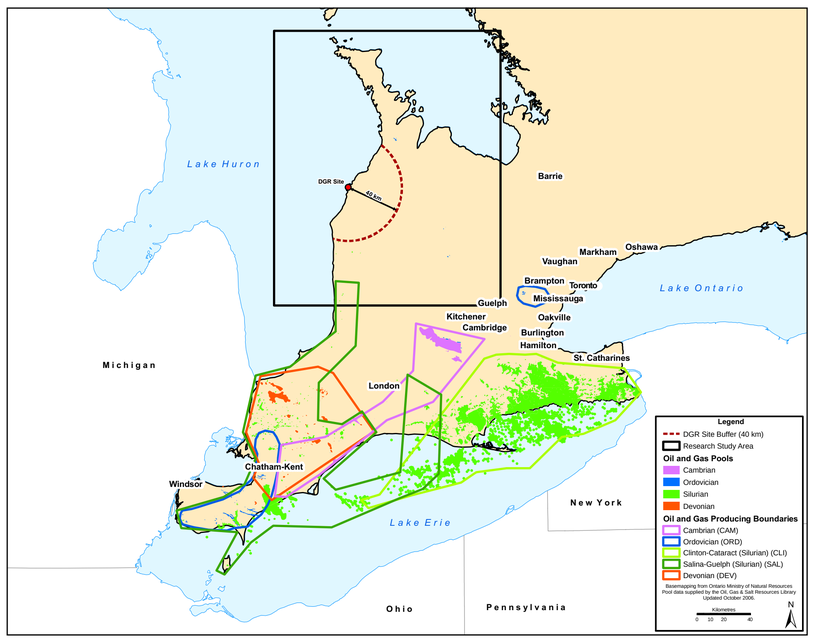


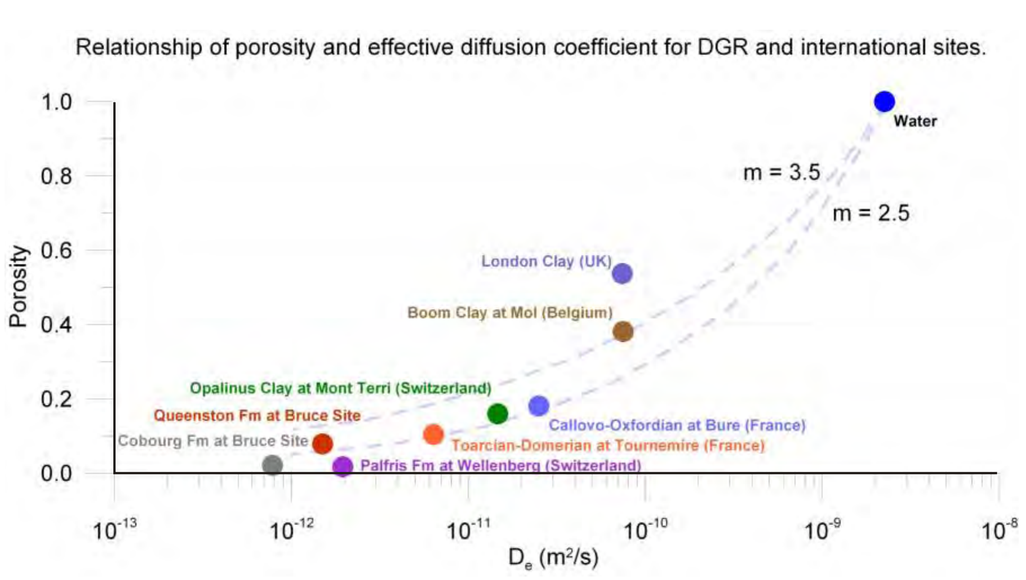
SHALLOW GROUNDWATER RESOURCES ISOLATED

- Local fresh groundwater resources are obtained from shallow overburden or near surface bedrock wells (<100 m depth)
- The chemistry of the waters found in the bedrock become progressively more saline (Total Dissolved Solids (TDS) 100 to 300 g/L) with depth which aids in defining shallow, intermediate and deep groundwater systems
- The chemistry of the ground and pore waters encountered during drilling indicate that the deep groundwater system within the Ordovician sediments is very old and has not mixed with glacial or present-day freshwater

LOW NATURAL RESOURCE POTENTIAL

- No significant oil or gas was encountered in three vertical boreholes drilled on site, nor in several historic oil and gas wells drilled within 10 km of the Bruce site
- There are no known industrial minerals (limestone, shale, etc.) that are unique to the site and cannot be obtained from elsewhere
- Salt deposits that occur in the Kincardine region and south were not intersected beneath the Bruce site





TRANSPORT DIFFUSION DOMINATED

- The distribution of natural tracers within the pore fluid of the hosting and enclosing Ordovician sediments suggests the existence of a diffusion dominated transport regime
- The low bedrock permeabilities measured in the deep boreholes are consistent with a diffusion dominant environment
- Numerical simulations of the regional groundwater system conducted by the University of Waterloo support the notion of a stable diffusion dominant system enclosing the repository

OPG'S DEEP GEOLOGIC REPOSITORY FOR LOW & INTERMEDIATE LEVEL WASTE

GEOSCIENTIFIC INVESTIGATIONS AT THE BRUCE SITE


Drill Site View Bruce Site

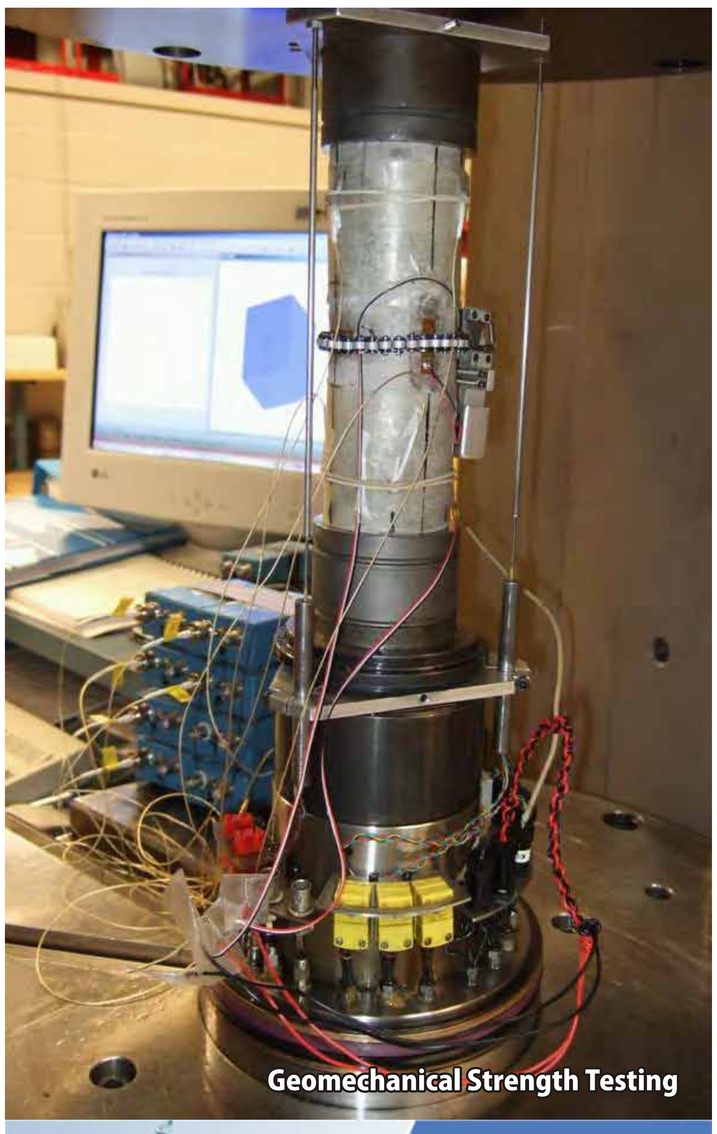
Diamond Core Drill Bit

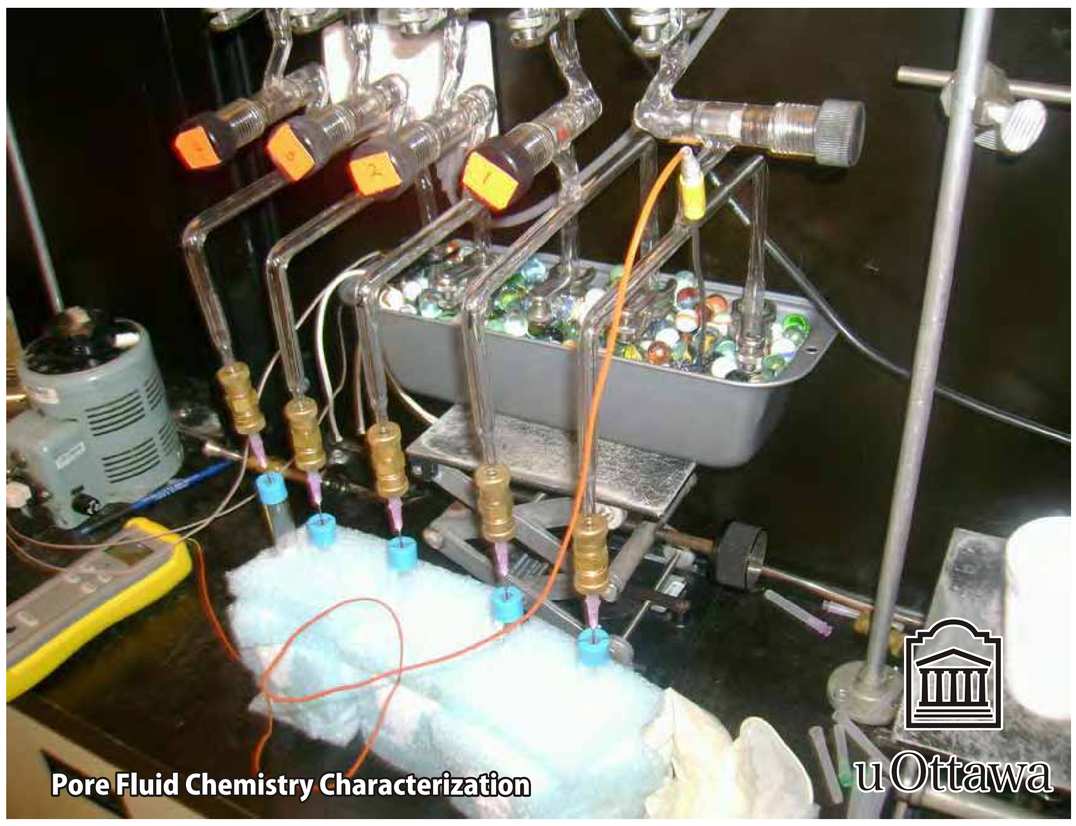

Rock Core Queenston Shale (Length 3 m)

Correlation Between Boreholes Aids Definition of Site Stratigraphy
Bentonite Ash Marker Bed Coboconk Formation


Core Logging Workshop

Rock Core Sample (15 - 20 cm) Preservation


Geomechanical Strength Testing


Pore Fluid Chemistry Characterization

CANMET

nwmo
NUCLEAR WASTE MANAGEMENT ORGANIZATION
SOCIÉTÉ DE GESTION DES DÉCHETS NUCLÉAIRES

ONTARIO POWER GENERATION

OPG'S DEEP GEOLOGIC REPOSITORY FOR LOW & INTERMEDIATE LEVEL WASTE

THE ROLE OF SAFETY ASSESSMENT

The role of safety assessment:

- Considers both the operating and after closure periods
- Analyses the DGR behavior under expected and abnormal conditions
- Quantifies potential impacts on public, workers and the environment
- Compares the potential impacts with regulatory criteria
- Provides feedback to help improve the site characterization and design

The Safety Assessment follows:

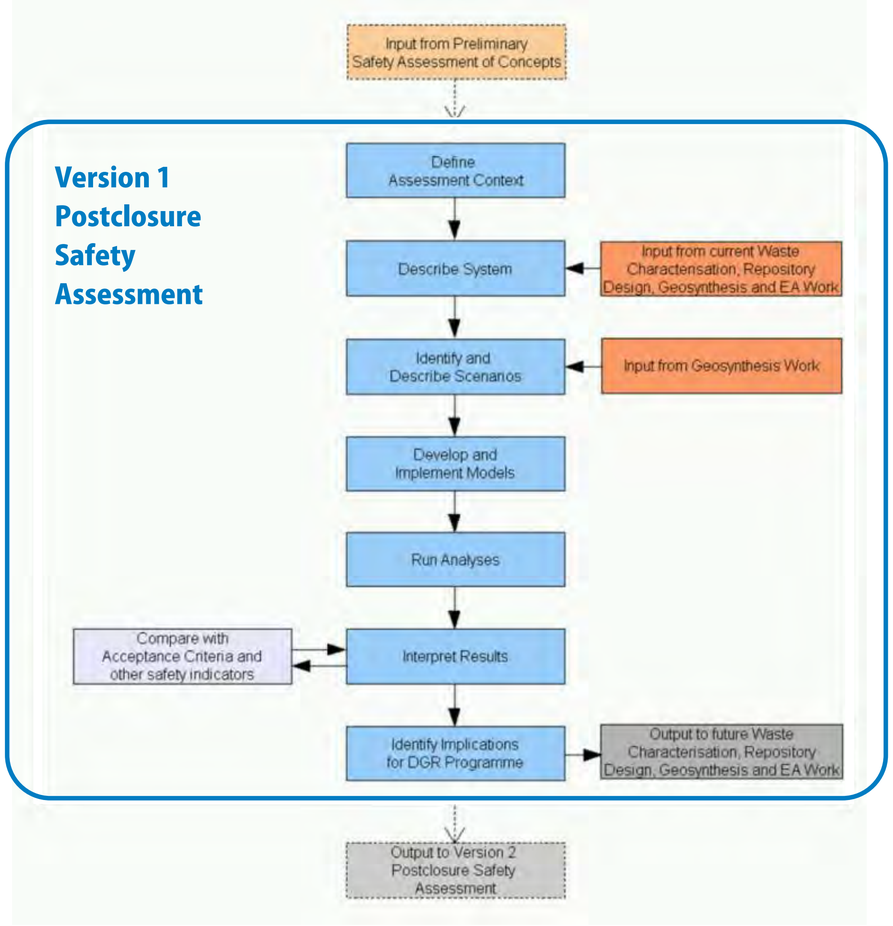
- Federal Environmental Assessment Guidelines for the DGR project
- Canadian Nuclear Safety Commission, policy and guidance, including:
  - CNSC P-290 – Managing Radioactive Wastes
  - CNSC G-320 – Assessing the Long Term Safety of Radioactive Waste Management
  - Nuclear Safety and Control Act and associated regulations
  - International best-practices

The interim "Version 1" Safety Assessment has been published, and is currently undergoing review by the regulator (CNSC) as well as international experts. To read the reports, go to www.nwmo.ca/dgrprojectdocuments.

Safety assessment is an iterative process:

Site Characterization	Waste Inventory	Design	Safety Assessment
Generic data (not site specific)	Draft inventory report	Early conceptual design	"Version 0" Initial assessment
Phase I Geosynthesis (2 boreholes)	Reference inventory report	Conceptual Design	"Version 1" Interim reports for peer review
Phase II Geosynthesis (6 boreholes)	2010 update	Preliminary Design	"Version 2" Construction license application
Construction Phase Verification	Future update	Final Design	Operating license application

We are here.



Safety Assessment follows a methodical process

OPG'S DEEP GEOLOGIC REPOSITORY FOR LOW & INTERMEDIATE LEVEL WASTE

OPERATIONAL (PRECLOSURE) SAFETY ASSESSMENT

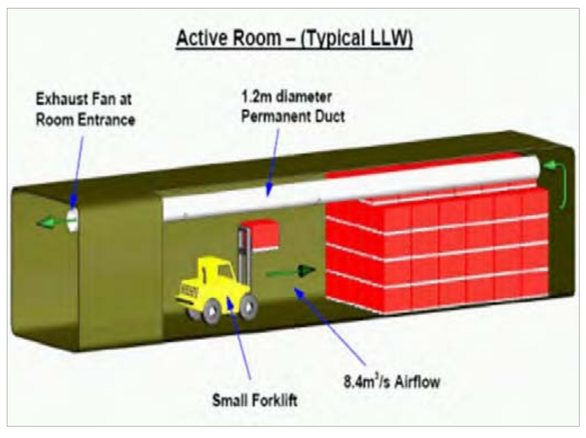
Focus on radiological safety – handling and storage of low & intermediate level waste packages – under normal operations and accident conditions. Conventional safety considered separately, primarily under the engineering design work.

Normal Operation

Waste packages received at DGR receipt building

Waste packages moved and placed in rooms underground

Rooms initially monitored and ventilated, and eventually closed.



Normal Operation Safety

- DGR waste handling operations will be similar to current operations at WWMF
- Small release of tritium and C-14 primarily as off-gas from packages until rooms are closed
- Public impact negligible – similar to WWMF
- External dose from waste packages
  - No public exposure due to distance and shielding – as with WWMF
  - Worker dose within OPG targets, controlled by shielding and task planning – as with WWMF

OPG'S DEEP GEOLOGIC REPOSITORY FOR LOW & INTERMEDIATE LEVEL WASTE

LONG-TERM (POSTCLOSURE) SAFETY ASSESSMENT - APPROACH

The Postclosure Safety Assessment addresses the safety of the repository after the underground portion has been closed and sealed. It looks far into the future. In the near-term, the site is expected to remain under institutional control. However, the safety assessment assumes that beyond a few hundred years, the site reverts to a green-field use.

Assessing the Future:

- Postclosure safety assessment is not a prediction of the future.
- Rather, it assesses a range of likely and unlikely futures or scenarios.
- Uncertainties are addressed through use of a range of scenarios, models and data.
- Uncertainties are also addressed through use of worst-case or cautious assumptions.
- Methodology follows Canadian regulatory guidance and international practice.

Scenarios Assessed:

Normal Evolution Scenario: Considers what is likely to happen within and around the repository in the future

Normal Evolution Scenario

– includes eventual glaciation across the site.
– assumes that people live on the repository site in the future.

Disruptive ("what if") Scenarios:
Unlikely scenarios that test the robustness of the repository.

Human Intrusion

What if someone accidentally drilled a deep borehole into the DGR and brought waste material to surface?

Severe Shaft Seal Failure

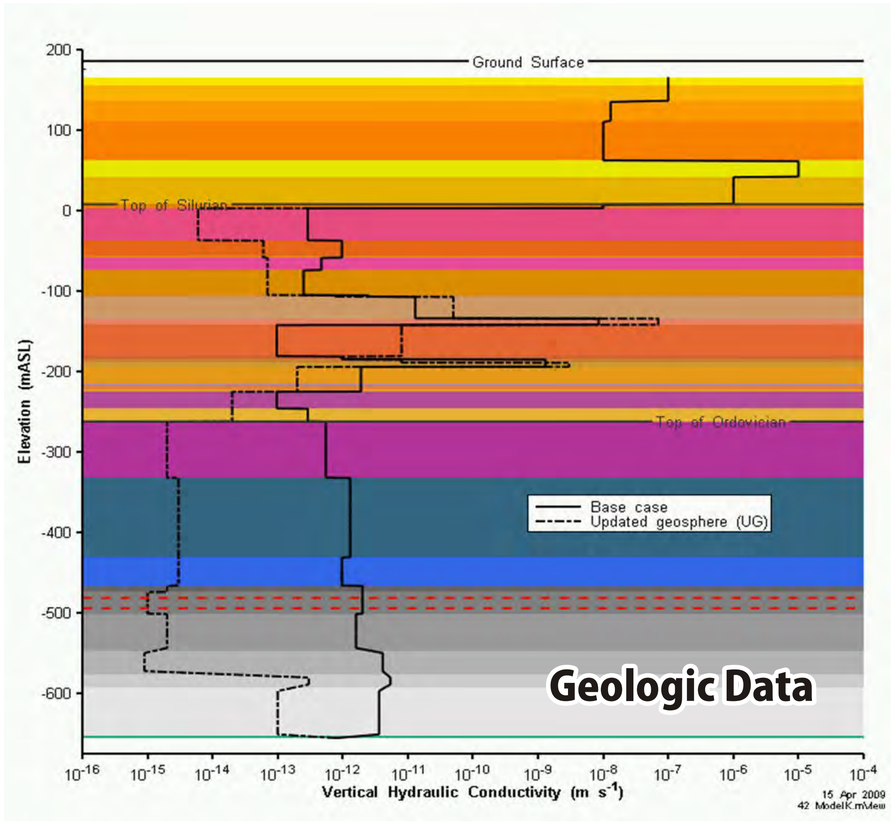
What if the main shaft seals failed completely?

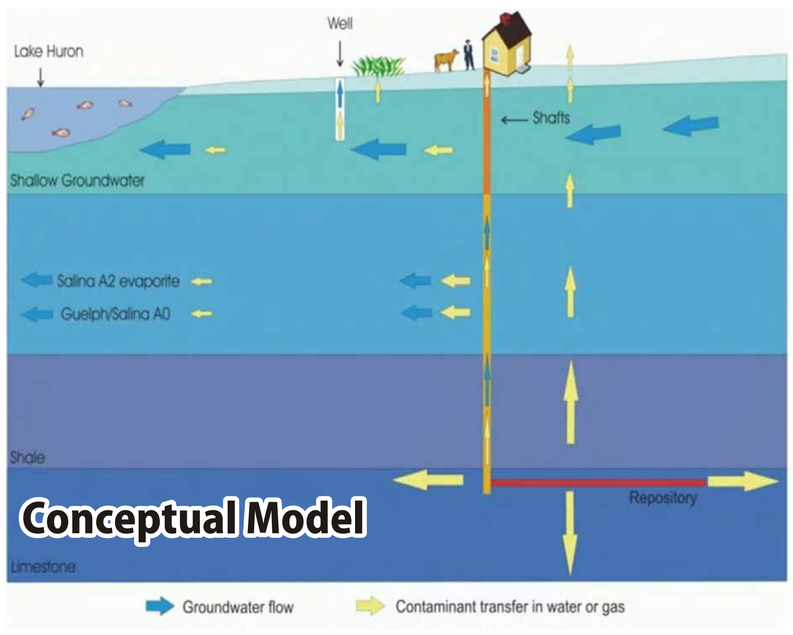
Open Borehole

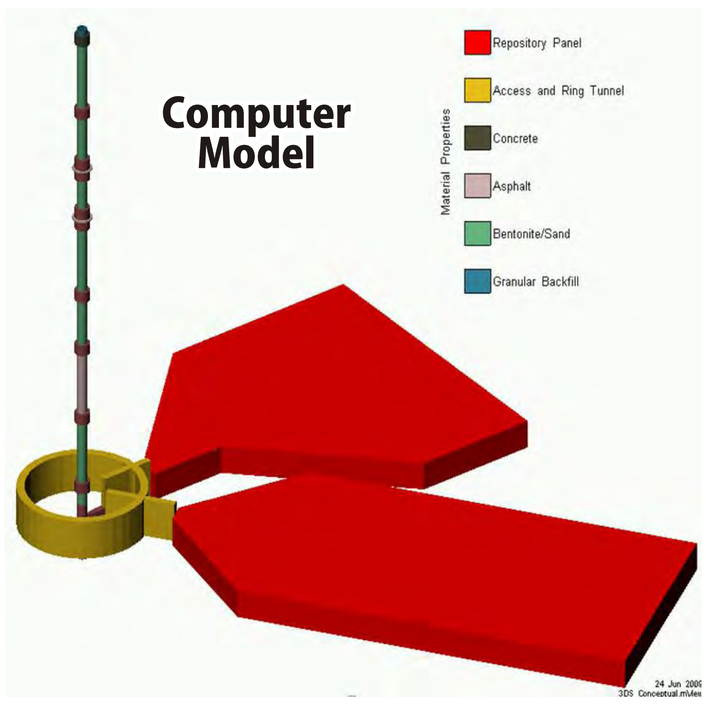
What if a site characterization or monitoring deep borehole accidentally became unsealed, or the seal failed completely?

Extreme Earthquake

What if a very large earthquake occurred and was able to open up an assumed nearby but presently closed vertical fault in the rock?







Assessment Method:

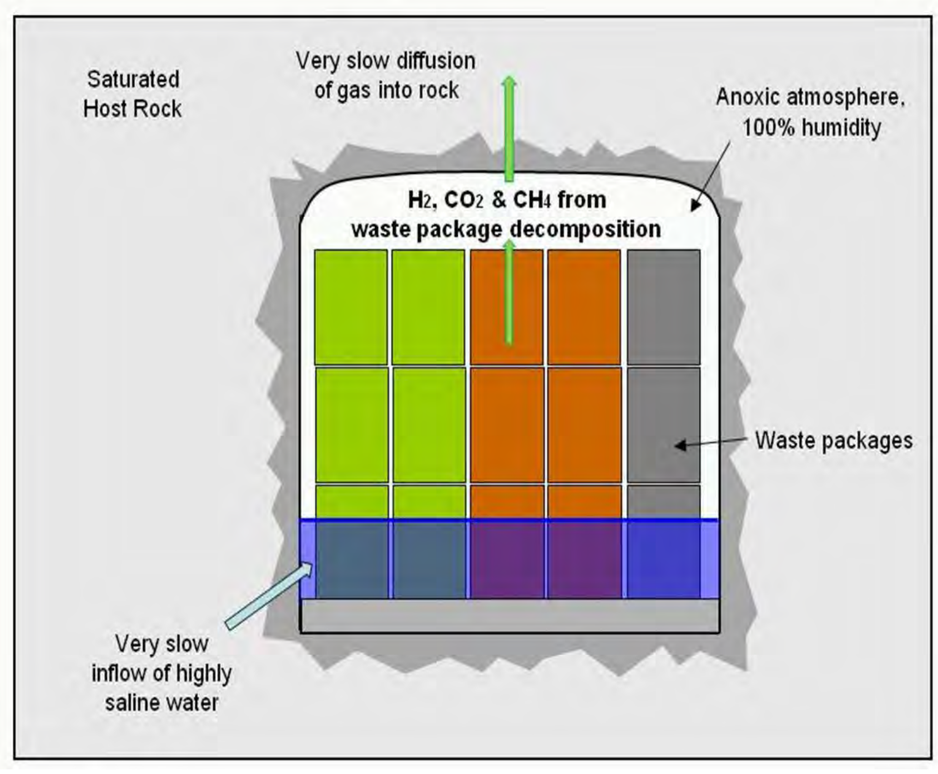
Site, design and waste inventory data is used to construct a conceptual model of possible pathways and to develop a computer model. The computer model is used to quantify what could happen under various scenarios.

nwmo
NUCLEAR WASTE MANAGEMENT ORGANIZATION
SOCIÉTÉ DE GESTION DES DÉCHETS NUCLÉAIRES

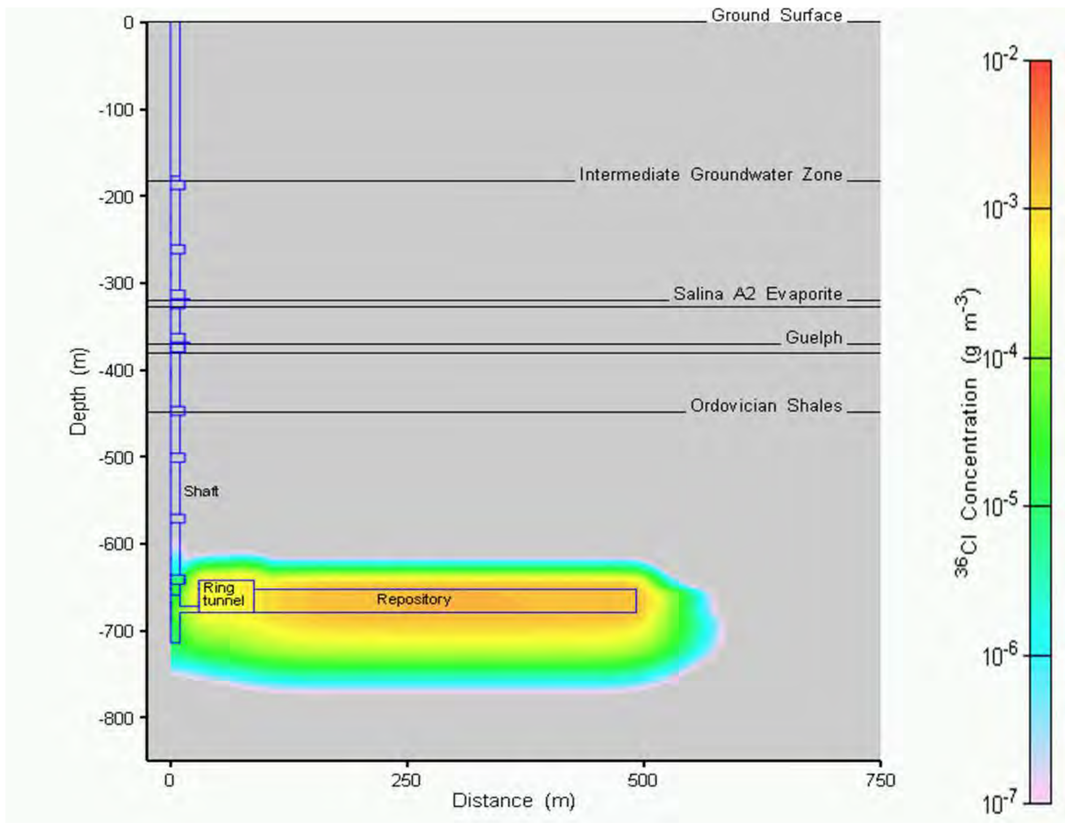
ONTARIO POWER GENERATION

OPG'S DEEP GEOLOGIC REPOSITORY FOR LOW & INTERMEDIATE LEVEL WASTE

LONG-TERM (POSTCLOSURE) SAFETY ASSESSMENT - RESULTS

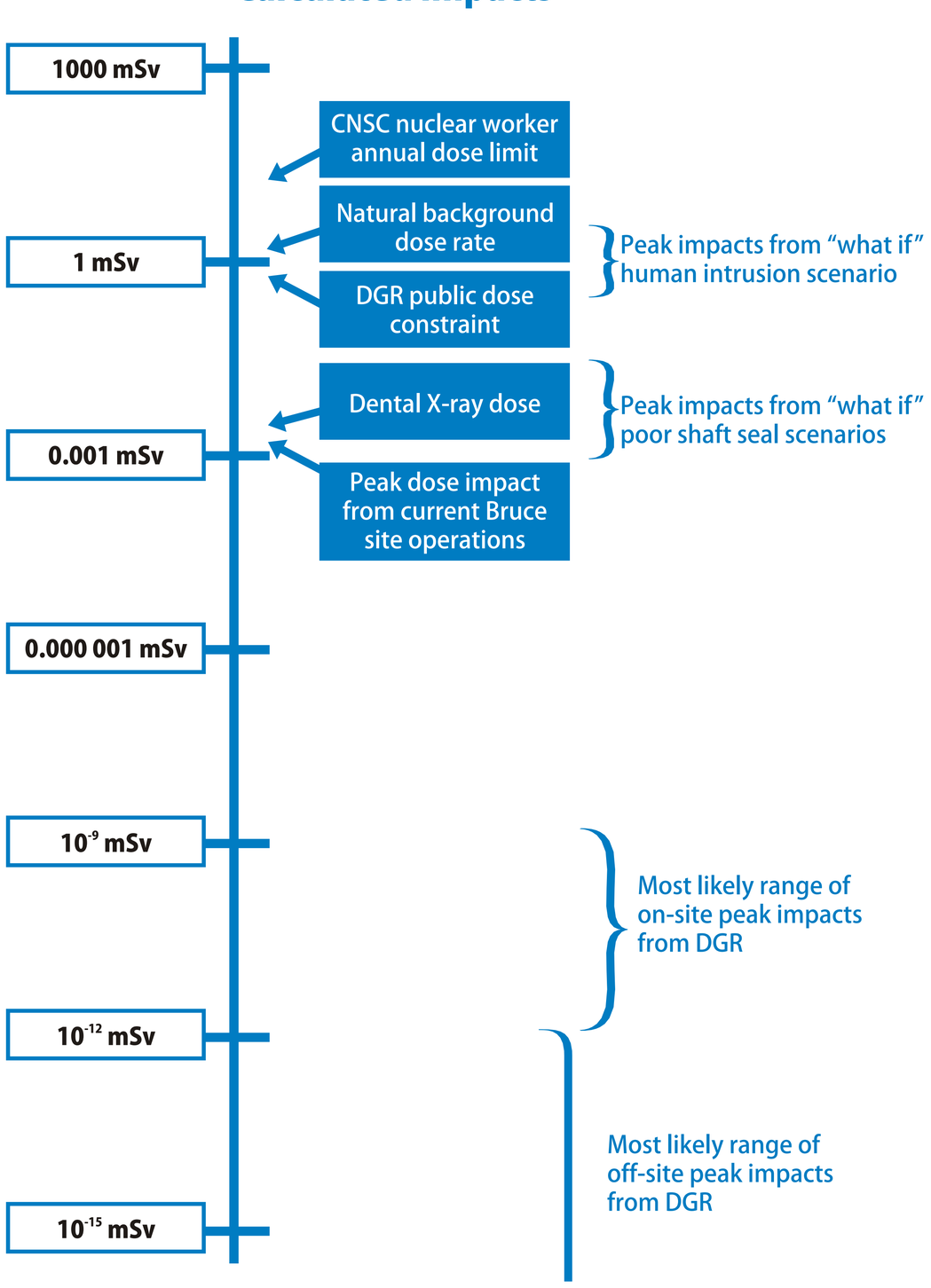


Repository resaturation will be very slow. Waste packages will degrade to produce gases, mostly methane, which will be trapped within the rock.



Radioactivity will be trapped within and around the repository. The figure shows the calculated distribution of Cl-36 after 100,000 years, assuming fast resaturation of repository.

Calculated impacts



Interim Safety Assessment Conclusions:

- Detailed safety assessment has been completed using interim data and design
- Approach is consistent with Canadian regulations and international practice
- Normal evolution scenario results:
  - Low to extremely low dose rates
  - Meets dose criterion
- Disruptive "what if" scenarios results:
  - Unlikely scenarios, cautiously modelled
  - Meet dose or risk criterion
- Interim conclusion – this is a good site

nwmo
NUCLEAR WASTE MANAGEMENT ORGANIZATION
SOCIÉTÉ DE GESTION DES DÉCHETS NUCLÉAIRES

ONTARIO POWER GENERATION

OPG'S DEEP GEOLOGIC REPOSITORY FOR LOW & INTERMEDIATE LEVEL WASTE

AN INTERNATIONAL PERSPECTIVE

Concept of planned facility in Germany

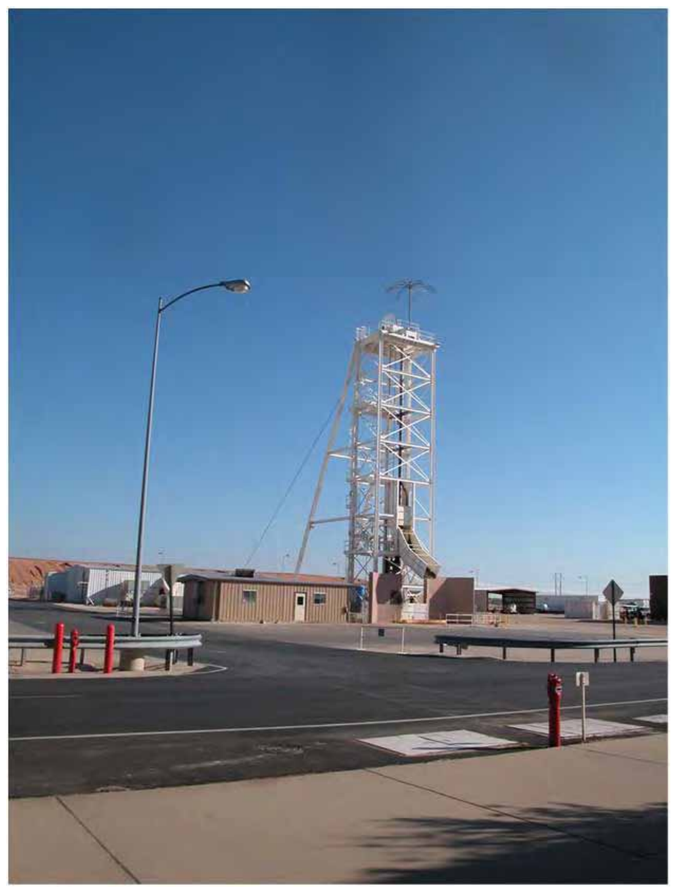
Around the world, research on the long-term management of nuclear waste has engaged thousands of scientists and involved billions of dollars in research.

NWMO collaborates with several international organizations concerned with nuclear waste management and has cooperative agreements with many countries that are in the forefront of nuclear waste management research and development. These links facilitate the exchange of technical information, joint research and development activities, and in some instances the exchange of technical staff. The DGR is no exception.

SFR, Sweden

In addition to the stringent regulatory review process that the proposed DGR will be subject to, a number of independent technical review groups have been established to provide oversight and the benefit of their knowledge and experience from other similar projects.

The Geoscience Review Group (GRG) includes representation from France, Switzerland, United States and Canada. The members have, between them, nearly one hundred years of experience and have worked on nuclear waste programs in Japan, Hungary, Switzerland, Sweden, Finland, Korea, United States, and the United Kingdom. The GRG independently assesses the adequacy of all aspects of the geoscientific investigations and the geosynthesis.



Headframe at Waste Isolation Plant, New Mexico

The Technical Review Group (TRG) was formed to advise NWMO on matters relating to the design and engineering of the DGR. The proposed DGR has many of the attributes of a mine. The TRG is comprised of independent technical experts who have extensive experience in the fields of deep underground mine construction, mine ventilation, mine hoisting, geomechanics and radioactive waste material handling.

The International Peer Review Group comprises safety assessment experts who have experience in the low and intermediate level waste management programs in Belgium, France and the United Kingdom. They will review safety assessment studies and advise whether the assessment is based on credible scientific and technical approaches and methodologies, and is consistent with international practices.

Examples of Other Facilities Around the World for Low and Intermediate Level Waste

The DGR would employ technology similar to that used at sites in United States, Sweden, and Finland. Each of these international sites has unique differences in site characteristics.

Waste Isolation Pilot Plant (WIPP) New Mexico, U.S.

- Located in the desert
- The underground repository was excavated in 250 million year-old bedded salt approximately 660m below surface
- Status: Began disposal operations in 1999

Forsmark Facility Sweden

- Located at the Forsmark nuclear power station site
- The underground repository is in crystalline rock about 60m below the Baltic Sea
- Status: Began operation in 1988

Olkiluoto (VLJ) Facility Finland

- Located near the Olkiluoto nuclear power station
- The underground repository was excavated to a depth of 70 to 100 m in crystalline rock
- Status: Began operation in 1992

nwmo
NUCLEAR WASTE MANAGEMENT ORGANIZATION
SOCIÉTÉ DE GESTION DES DÉCHETS NUCLÉAIRES

ONTARIO POWER GENERATION

OUR ANSWERS TO SOME OF YOUR PREVIOUS QUESTIONS:

Will used nuclear fuel be stored in the DGR?	The DGR will not manage used nuclear fuel. The Municipality of Kincardine has passed a resolution indicating that no used fuel will be placed in the DGR. OPG is seeking regulatory approval for site preparation and construction of a DGR for low and intermediate level waste only.
Will waste from other producers be stored in the DGR?	No. The DGR will manage low and intermediate level waste currently managed by OPG at the Bruce site and wastes produced during the remaining operating lives of OPG owned nuclear generating stations in Ontario, including Darlington, Pickering and Bruce.
Have the potential effects of abnormal events and terrorist activities been evaluated?	Yes. The documentation provided for the regulatory approvals process will include an assessment of potential malfunctions and accident scenarios, as a result of unintentional and intentional acts and accidental or abnormal events that could impact the public and the environment throughout the DGR's lifetime and after its closure. A few examples of abnormal events being evaluated include fire or container breach, unintentional intrusion into the repository, and failure of the shaft seal.
Why is the DGR located in proximity to Lake Huron?	The DGR is located more than 1 km distant from the shore of Lake Huron at the surface and a distance greater than 400 metres below the deepest near-site point of Lake Huron. The DGR is separated from Lake Huron by a low permeability layer of shale, which isolates the waste.
How will Great Lakes water quality be protected?	Great Lakes water quality will not be adversely affected by the DGR. The low and intermediate level waste is being placed in low permeability limestone, overlain by about 200 metres of low permeability shale. The characteristics of these rocks, including their age, stability and their position well below the level of the bottom of Lake Huron will virtually eliminate the migration of radionuclides to the lake. Any migration that does take place will be over a period of hundreds of thousands of years and the radionuclide concentrations will be orders of magnitude below the current regulatory limits.
Did OPG consider other sites for the DGR?	Experience in other countries has shown that success in siting a waste disposal facility is greatly improved in situations where the community supports the proposal. The Municipality of Kincardine approached OPG asking to jointly assess the feasibility of hosting a long-term low and intermediate level waste management facility. Once the results of these feasibility studies indicated that the Bruce site could be a safe and technically feasible site, the Kincardine Municipal Council volunteered to host a DGR for low and intermediate level waste. Results of a telephone poll indicated that a majority of residents support the DGR. No other sites volunteered to participate in the feasibility studies or to host the facility.
How do other countries manage their low and intermediate level nuclear waste?	Several other countries use similar technology for managing low and intermediate level waste. • United States stores transuranic waste in a deep repository in New Mexico • Sweden manages its low and intermediate level waste in an underground repository approximately 60 metres under the seabed, in rock situated below the Baltic Sea and near a nuclear power station • Finland manages low and intermediate level waste in an underground repository located near a nuclear generating station and excavated in rock 110 metres below ground.