

PMD 13-P1.136A

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**Supplementary Information  
Oral intervention**

**Presentation from  
Charles Hazell**

In the Matter of

**Ontario Power Generation Inc.**

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Proposed Environmental Impact Statement  
for OPG's Deep Geological Repository  
(DGR) Project for Low and Intermediate  
Level Waste

Joint Review Panel

**September 16 to October 12, 2013**

**Renseignements supplémentaires  
Intervention orale**

**Présentation par  
Charles Hazell**

À l'égard de

**Ontario Power Generation Inc.**

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Étude proposée pour l'énoncé des incidences  
environnementales pour l'Installation de  
stockage de déchets radioactifs à faible et  
moyenne activité dans des couches géologiques  
profondes

Commission d'examen conjoint

**Du 16 septembre au 12 octobre 2013**

In the Matter of

**Ontario Power Generation Inc.**

**Proposed Environment Impact Statement for OPG's Deep Geological  
Repository (DGR) Project for Low and Intermediate Level Waste  
(L&ILW)**

Kincardine, Ontario

To the

**Joint Review Panel**

**September / October, 2013**

Presented by

**Charles Hazell**

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- **View of Southern Ontario taken by Commander Hadfield from space. The Bruce peninsula is in the middle of the image**


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## **1. INTRODUCTION**

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

English (CA)

About the DGR > Background Info > Community Engagement > Project Development > Regulatory Process > DGR Submission > DGR Public Hearing > Contact Info




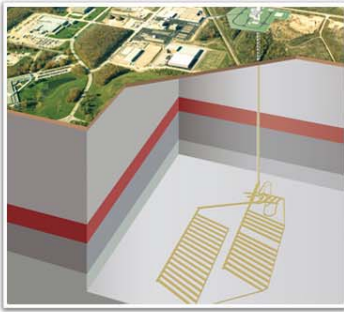
You are here: Home - About the DGR

**About the DGR**

- DGR Key Features
- Project Schedule
- DGR Transition to NWMO

**OPG's Deep Geologic Repository Project for Low & Intermediate Level Waste (L & ILW)**

The Nuclear Waste Management Organization (NWMO) is assisting Ontario Power Generation (OPG) in seeking regulatory approval for construction of a proposed Deep Geologic Repository (DGR) for the long-term management of low and intermediate level waste (L&ILW) from OPG-owned or operated reactors. The DGR is planned adjacent to OPG's Western Waste Management Facility (WWMF) on the Bruce nuclear site in the Municipality of Kincardine.

Artist's Rendition of Deep Geologic Repository

**DGR Submission**

On April 14, 2011, OPG submitted the Environmental Impact Statement (EIS), Preliminary Safety Report (PSR) and supporting documents for its proposed Deep Geologic Repository Project.

Click here to view the DGR Submission documents

**What's New**

- DGR Newsletter - July 2013
- JRP Announces Public Hearing for DGR Project

**DGR Contact Information**  
Contact information for the DGR project is:

Box 7020, B21  
Tiverton, Ontario  
N0G 2T0 Canada  
Tel: 519-365-1039  
Fax: 519-365-1007  
Email: [dgrinfo@opg.com](mailto:dgrinfo@opg.com)

SITEMAP  
TERMS OF USE  
PRIVACY NOTICE  
CONTACT US

Aug-27-2013 11:44:28 AM EDT  
© 2010 Nuclear Waste Management Organization

- Opening image from NWMO DGR 1 website
- Consistent use of inaccurate graphics
- Site characterization
- Importance of accuracy
- Manipulation and bias

## 2. SITE CHARACTERIZATION

### 2.1 Nuclear myth and corporate culture

Investor Relations | Customers & Suppliers | Employees/Pensioners | Careers Home | FAQ | Contact Us

ABOUT OPG POWER GENERATION SAFETY & ENVIRONMENT IN THE COMMUNITY LEARNING ZONE NEWS ROOM

# ONTARIO POWER GENERATION

MAP OF OPERATIONS  
HYDRO  
**NUCLEAR**

- How It Works
- Darlington Nuclear
- Darlington Refurbishment
- Darlington New Nuclear
- Pickering Nuclear
- Nuclear Waste Management
  - Types of Waste
  - How Waste is Managed
  - Deep Geologic Repository
    - Transportation
    - Assuring the Future
    - Health and Safety
    - Communicating with You
  - Communicating with You
  - Regulatory Reporting
  - Post-Fukushima Actions

THERMAL

## Deep Geologic Repository

**THE PROPOSED DGR: PROTECTING THE SURROUNDING ENVIRONMENT**

What is the Deep Geologic Repository (DGR)?  
Check out our [new website](#) and find out.

**Public Hearing Scheduled: September 16, 2013**  
June 20, 2013

The Joint Review Panel (JRP) for OPG's proposed Deep Geologic Repository (DGR) project for low and intermediate level waste (L&ILW) has announced the public hearing for the project. It will take place from September 16 to October 12 and be held in the following locations:

September 16 to October 5, 2013  
Royal Canadian Legion  
219 Lambton Street  
Kincardine, Ontario

October 7 to October 12, 2013  
Saugen Shores Community Complex - Rotary Hall  
800 Tomlinson Drive  
Port Eggle, Ontario

Additional details, including a schedule, will be available in advance of the hearing. Please visit the [Canadian Environmental Assessment Agency website](#) for more information on the hearing and how to participate.

Regular project updates are provided through [DGR newsletters](#), speeches, presentations, and at community events with the DGR mobile exhibit. Members of the public are encouraged to ask questions and stay informed on the project.

**The Project**

OPG has safely transported, processed and stored nuclear waste for more than 40 years. With the support of Bruce County municipalities, OPG has proposed to construct and operate a DGR that would safely isolate and contain low and intermediate level waste. The DGR would be located 680 metres below ground, in stable rock formations over 450 million years old.

**Joint Review Panel and Public Hearing**

- JRP Documents and Public Registry
- Hearing Announcement: Sept. 16, 2013
- Public Comment Period Closed: April 25, 2013
- DGR Information Session: March 20, 2013

**OPG JRP Hearing Submissions**

- Site Preparation & Construction (PMD 13-P1.1)
- Environmental Assessment (PMD 13-P1.1)

**Project Information**

- DGR Fact Sheet
- DGR Overview Brochure: Feb. 2013
- DGR Submission
- EIS Summary Report
- Protecting Lake Huron
- Frequently Asked Questions
- Project Archives

**Newsletters**

[Click here for the latest DGR project newsletter.](#)

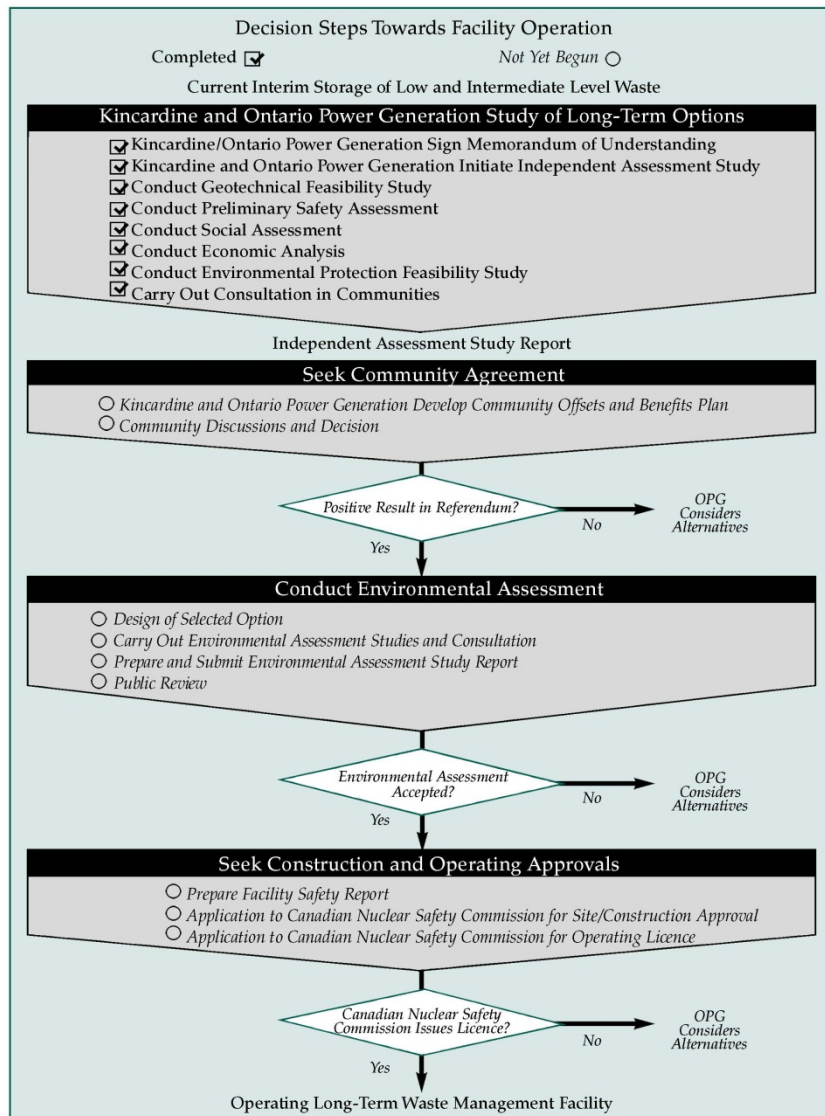
**Video**

[Click here to watch the DGR project video.](#)

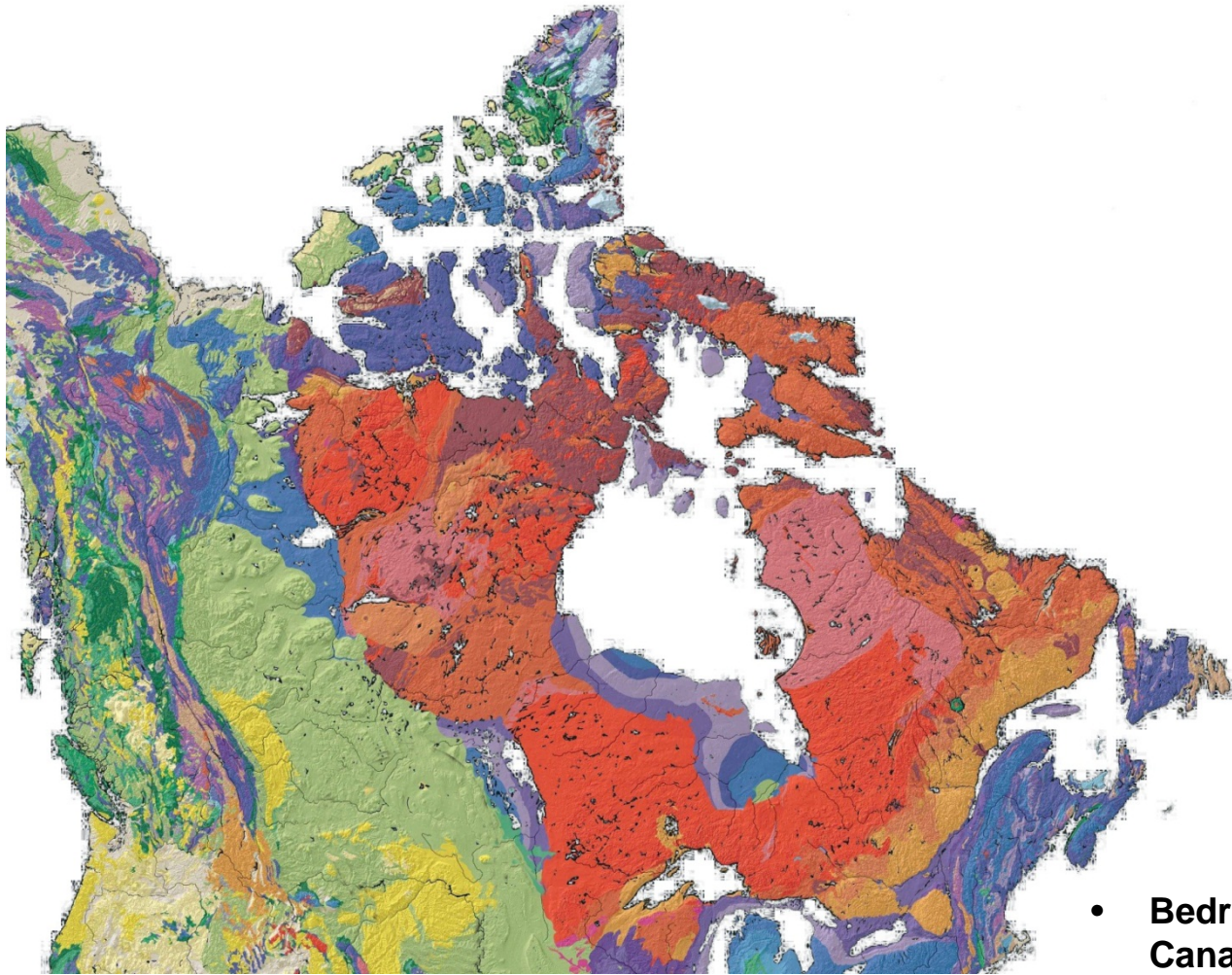
**Contact Information**

Ontario Power Generation  
Box 7000, B21  
Toronto, ON M9G 2T0  
Canada  
Tel: (519) 368-1839  
Fax: (519) 368-1607  
E-mail: [dgrinfo@opg.com](mailto:dgrinfo@opg.com)

- Opening image on OPG website
- Scale and special relationships
- Consistent use of inaccurate graphics
- Site characterization
- Importance of accuracy
- Manipulation and bias



- Adaptive management concept
- Go/no go thresholds
- Legitimacy
- Necessary conditions for proceeding to the next step
- Commitment to uphold standards



- **Bedrock Geology of Canada**

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2.3 Geology glaciation and the DGR



# MAP III Bedrock Geology of Grey and Bruce Counties

**GEOLOGIC FORMATIONS OF GREY AND BRUCE**

**MIDDLE DEVONIAN**

33 DETROIT RIVER FORMATION: limestone, dolostone, reefs

**LOWER DEVONIAN**

32 BOIS BLANC FORMATION: cherty limestone

**UPPER SILURIAN**

30a BASS ISLANDS FORMATION: dolostone

29 SALINA FORMATION: dolostone, shale, gypsum, salt

**MIDDLE AND LOWER SILURIAN**

28 GUELPH FORMATION: dolostone, bioherms

27 AMABEL FORMATION: dolostone

25 CABOT HEAD FORMATION: shale

MANITOULIN FORMATION: dolostone

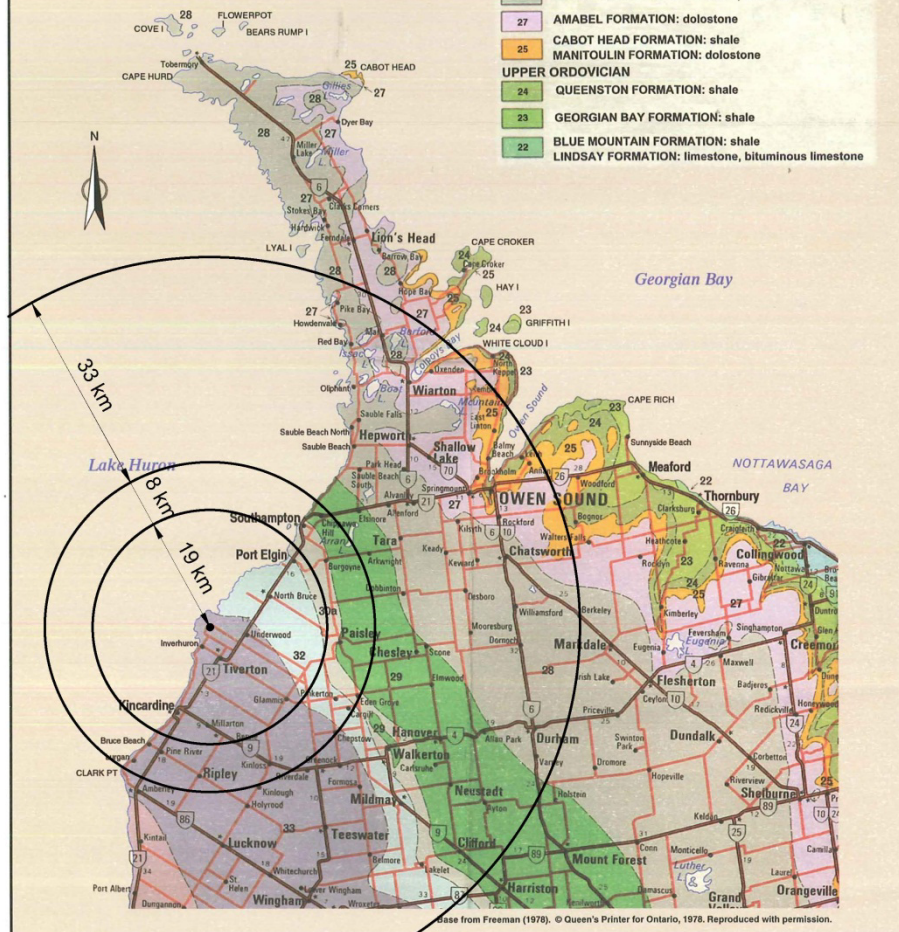
**UPPER ORDOVICIAN**

24 QUEENSTON FORMATION: shale

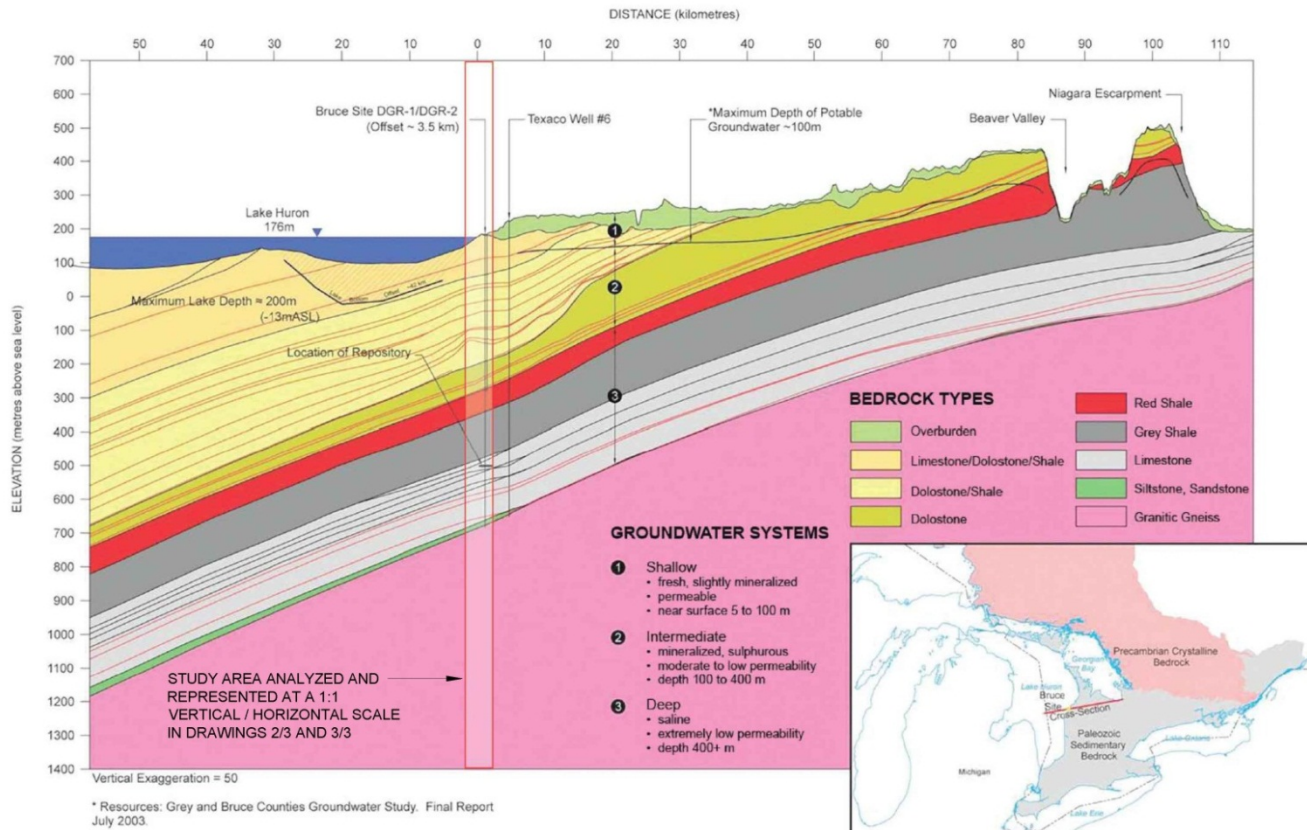
23 GEORGIAN BAY FORMATION: shale

22 BLUE MOUNTAIN FORMATION: shale

LINDSAY FORMATION: limestone, bituminous limestone



- Proximity studies
- Bedrock geology of Bruce and gray counties



"Regional bedrock stratigraphy, surface water and groundwater systems relative to DGR safety illustrate multiple natural barriers that will safely isolate and contain I&LW."

(OPG's Deep Geological Repository Project for Low and Intermediate Level Waste, Environmental Impact Statement Summary, March 2011, page 29)

BRUCE PENINSULA DEEP GEOLOGIC REPOSITORY 1 (DGR-1) FOR LOW AND INTERMEDIATE LEVEL NUCLEAR WASTE

**NWMO APPROACH AS ILLUSTRATED IN THE CONTEXT OF THE REGIONAL BEDROCK STRATIGRAPHY, SURFACE WATER AND GROUNDWATER SYSTEMS**

(Source: Grey and Bruce Counties Groundwater Study, Final Report, July 2003, as referenced in OPG's Deep Geological Repository Project for Low and Intermediate Level Waste, Environmental Impact Statement Summary, March 2011, page 29)

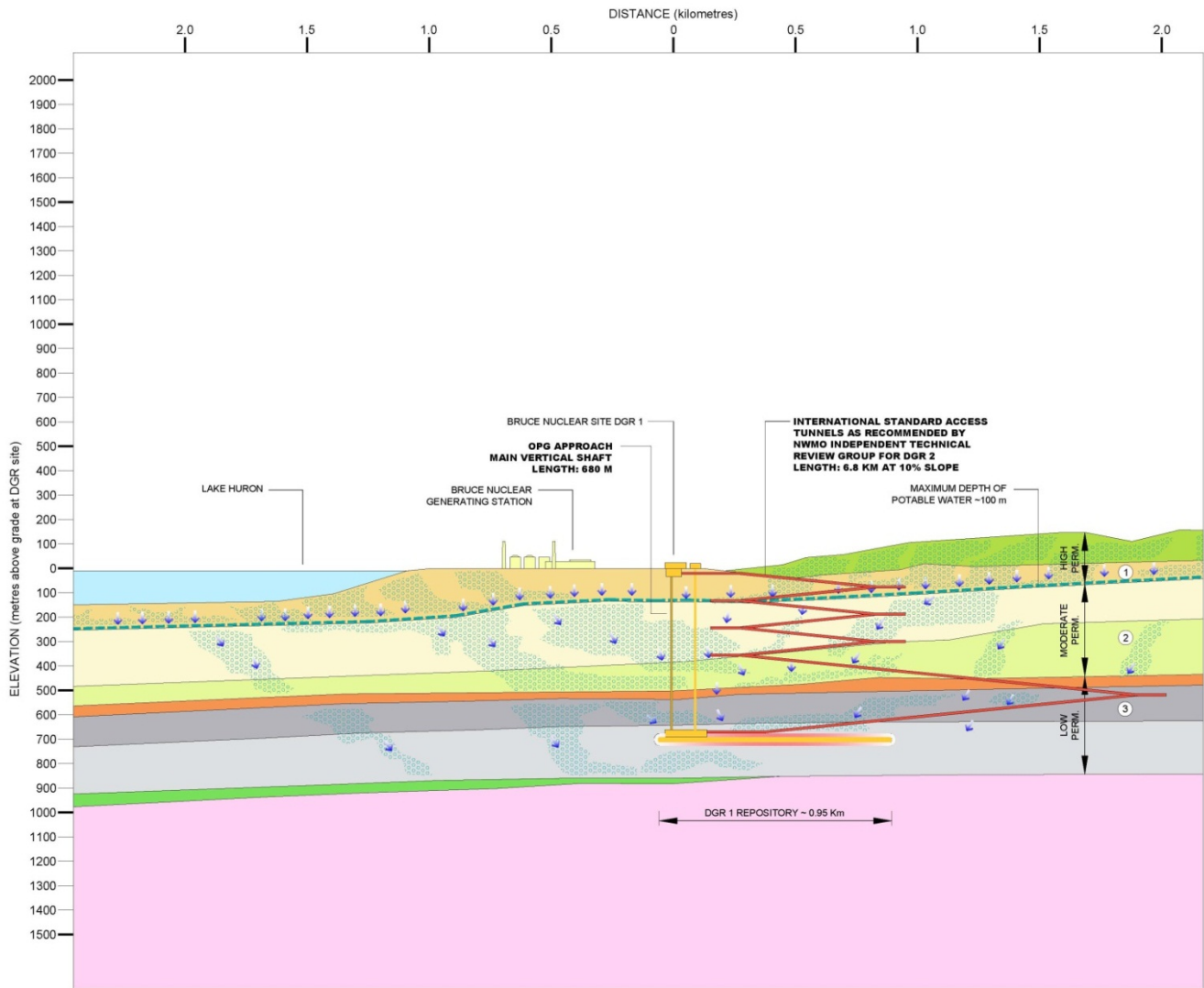
**Vertical / Horizontal Scale 50:1**

NOTE: VERTICAL SCALE EXAGGERATION IS 50 TIMES THE HORIZONTAL SCALE

**SOS**  
Sagehen Shores, Ontario

**1/3**  
August 2013

- **Scale**
- **Geology**



**BRUCE PENINSULA DEEP GEOLOGIC REPOSITORY 1 (DGR-1) FOR LOW AND INTERMEDIATE LEVEL NUCLEAR WASTE**

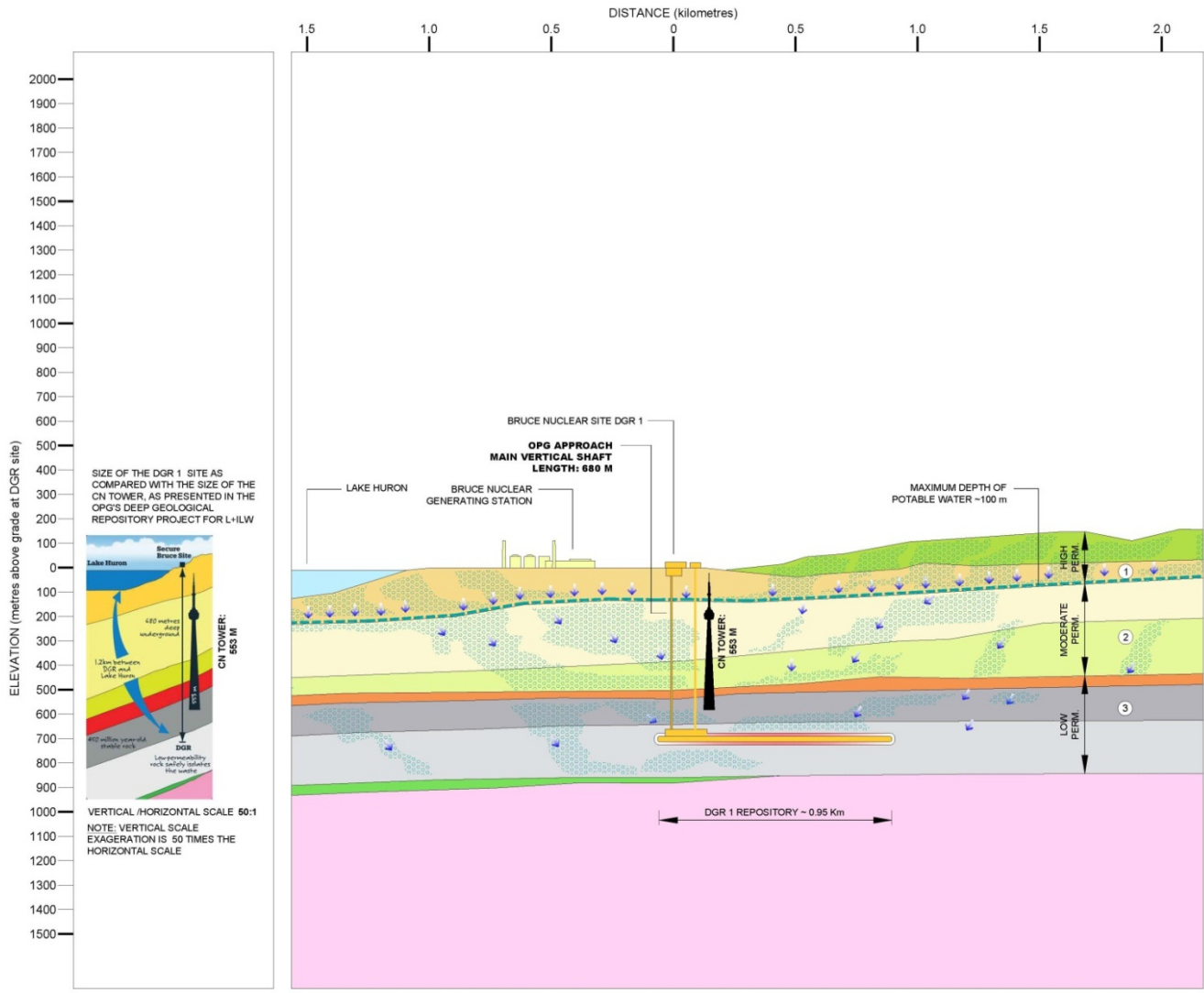
**DGR 1 PROJECT IN THE CONTEXT OF THE REGIONAL BEDROCK STRATIGRAPHY, SURFACE WATER AND GROUNDWATER SYSTEMS**

- GROUNDWATER SYSTEMS**
- ① **SHALLOW**
    - FRESH WATER
    - HIGH PERMEABILITY
    - NEAR SURFACE 5-200 M
  - ② **INTERMEDIATE**
    - MINERALIZED, SULPHUROUS WATER
    - MODERATE PERMEABILITY
    - DEPTH 200-400 M
  - ③ **DEEP**
    - SALINE WATER
    - LOW PERMEABILITY
    - DEPTH OVER 400 M

- BEDROCK TYPES**
- OVERBURDEN
  - LIMESTONE /DOLOSTONE /SHALE
  - DOLOSTONE /SHALE
  - DOLOSTONE
  - RED SHALE
  - GREY SHALE
  - LIMESTONE
  - SILTSTONE /SANDSTONE
  - GRANITIC GNEISS

**VERTICAL / HORIZONTAL SCALE 1:1**  
 NOTE: VERTICAL SCALE EQUALS HORIZONTAL SCALE

- Corrected scale
- Typical and preferred access systems
- hydrogeology



BRUCE PENINSULA DEEP GEOLOGIC REPOSITORY 1 (DGR-1) FOR LOW AND INTERMEDIATE LEVEL NUCLEAR WASTE

**SIZE OF THE DGR 1 SITE AS COMPARED WITH THE SIZE OF THE CN TOWER, AS PRESENTED IN THE OPG'S DEEP GEOLOGICAL REPOSITORY PROJECT FOR L+ILW, AND IN THE CONTEXT OF THE CORRECTED SIZE OF THE FACILITY.**

**SCHEME ILLUSTRATES OPG'S APPROACH OF USING VERTICAL ACCESS SHAFTS TO THE UNDERGROUND REPOSITORY.**

**GROUNDWATER SYSTEMS**

- ① **SHALLOW**
  - FRESH WATER
  - HIGH PERMEABILITY
  - NEAR SURFACE 5-200 M
- ② **INTERMEDIATE**
  - MINERALIZED, SULPHUROUS WATER
  - MODERATE PERMEABILITY
  - DEPTH 200-400 M
- ③ **DEEP**
  - SALINE WATER
  - LOW PERMEABILITY
  - DEPTH OVER 400 M

**BEDROCK TYPES**

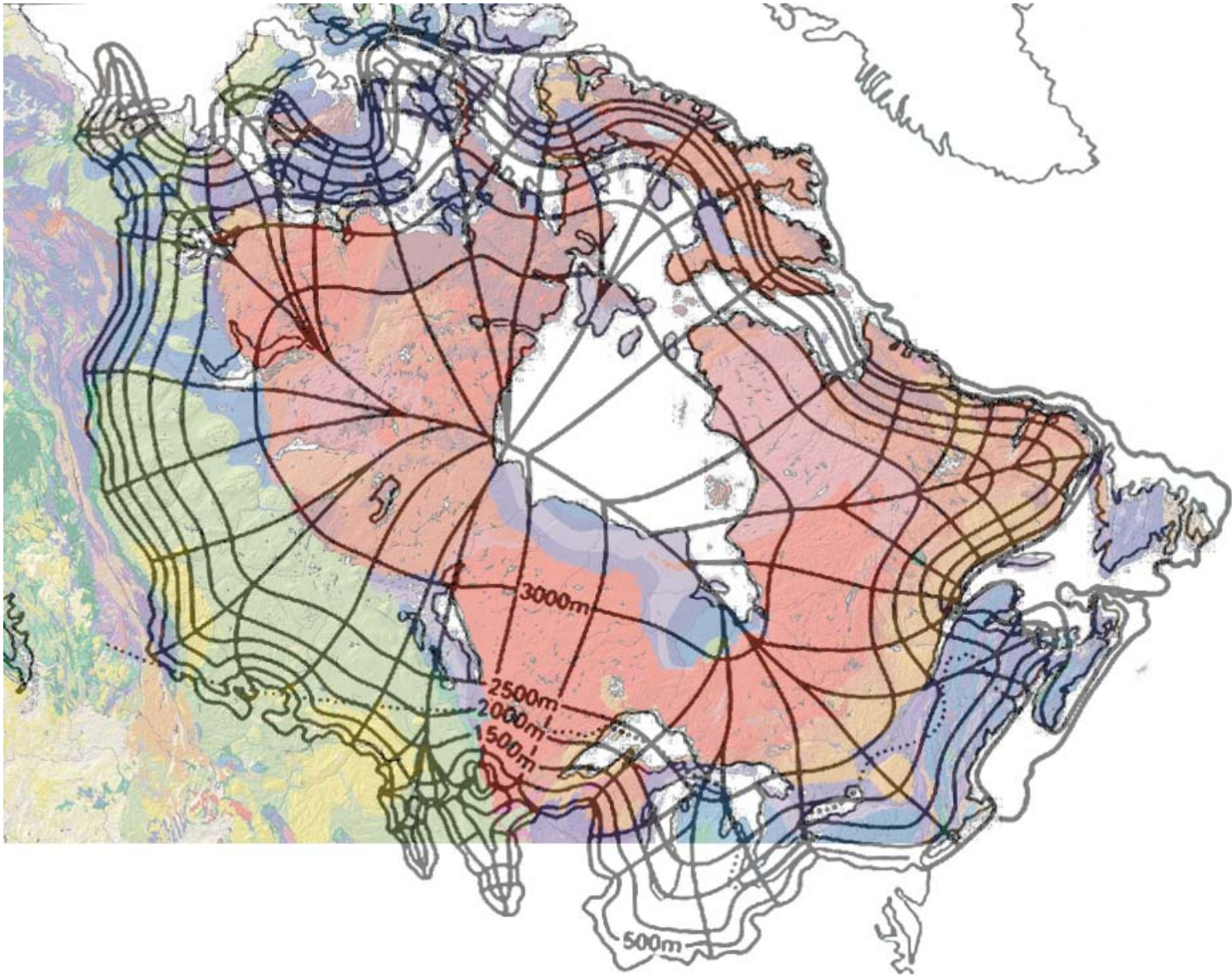
- OVERBURDEN
- LIMESTONE /DOLOSTONE /SHALE
- DOLOSTONE /SHALE
- DOLOSTONE
- RED SHALE
- GREY SHALE
- LIMESTONE
- SILTSTONE /SANDSTONE
- GRANITIC GNEISS

**VERTICAL / HORIZONTAL SCALE 1:1**  
NOTE: VERTICAL SCALE EQUALS HORIZONTAL SCALE

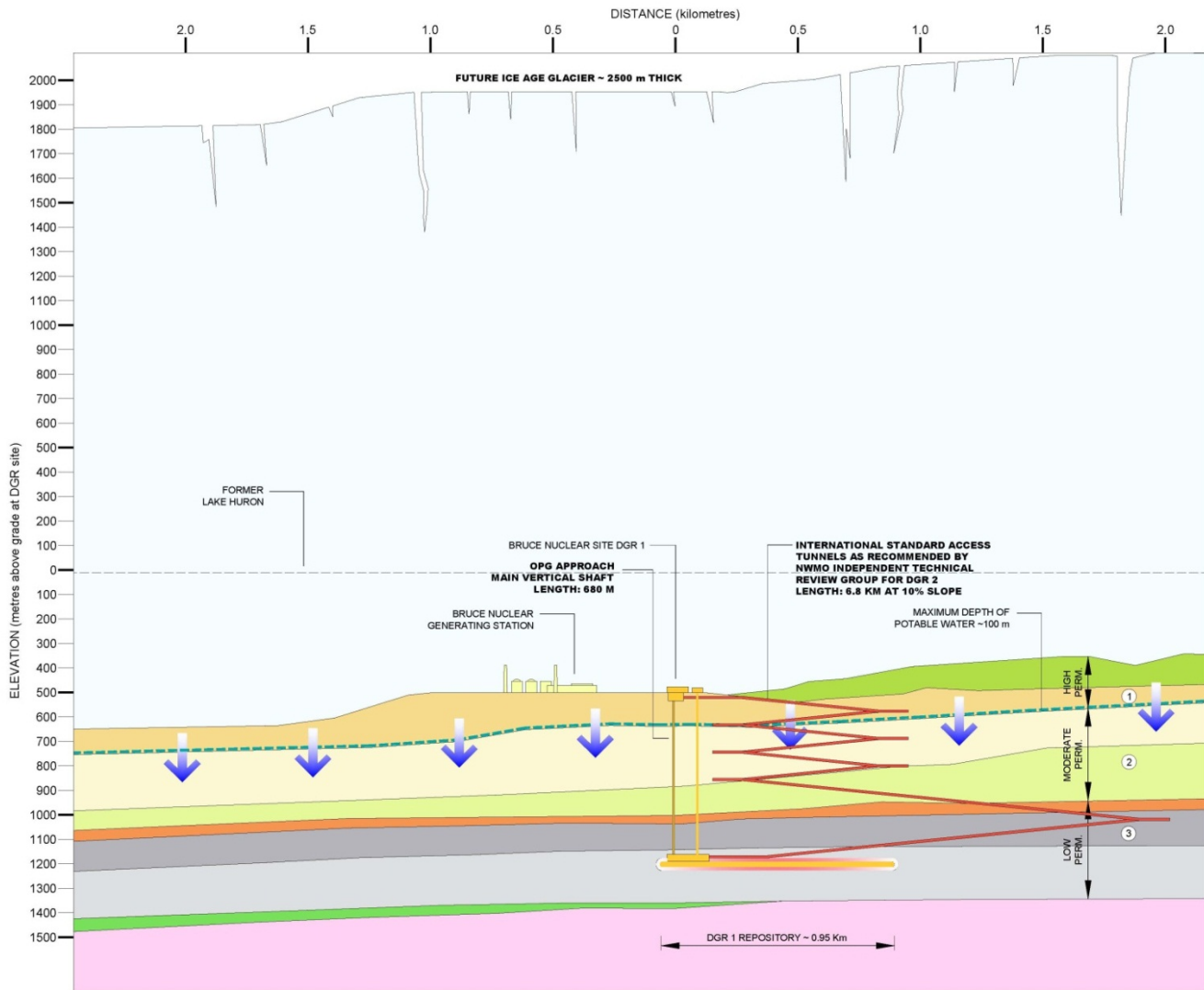


**2/3A**  
August 2013

- Corrected scale
- Site characterization diagram



- Glaciation Ice shield thickness



BRUCE PENINSULA DEEP GEOLOGIC REPOSITORY 1 (DGR-1) FOR LOW AND INTERMEDIATE LEVEL NUCLEAR WASTE

**DGR 1 PROJECT IN THE CONTEXT OF THE FUTURE ICE AGE**  
 (Re: Geological Survey of Canada, Natural Resources Canada)

- GROUNDWATER SYSTEMS**
- ① **SHALLOW**
    - FRESH WATER
    - HIGH PERMEABILITY
    - NEAR SURFACE 5-200 M
  - ② **INTERMEDIATE**
    - MINERALIZED, SULPHUROUS WATER
    - MODERATE PERMEABILITY
    - DEPTH 200-400 M
  - ③ **DEEP**
    - SALINE WATER
    - LOW PERMEABILITY
    - DEPTH OVER 400 M

**VERTICAL / HORIZONTAL SCALE 1:1**  
 NOTE: VERTICAL SCALE EQUALS HORIZONTAL SCALE

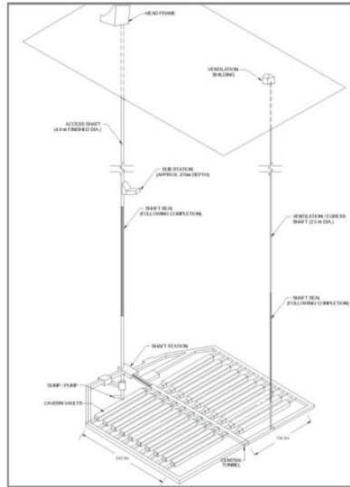


**3/3**  
 August 2013

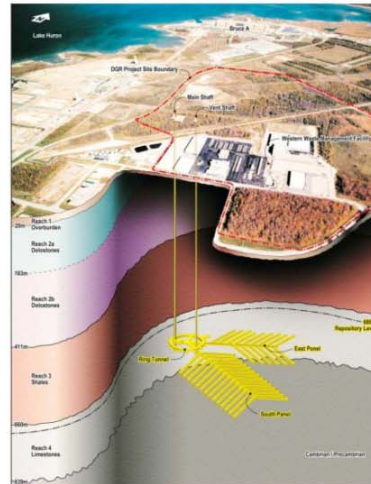
- Glaciation
- Scientific reports

# HYDROGEOLOGY

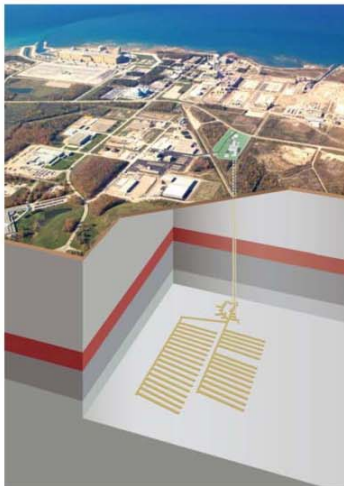
- Inadequate assessment of construction impacts (e.g. dewatering) and mitigation techniques
  - Over reliance on adaptive management as compensation for insufficient site investigation
  - Application of numerical groundwater models for predictive purposes that have not been adequately calibrated.
  - Superficial consideration of climate change scenarios
  - Inadequate consideration of potential extreme events scenarios
-



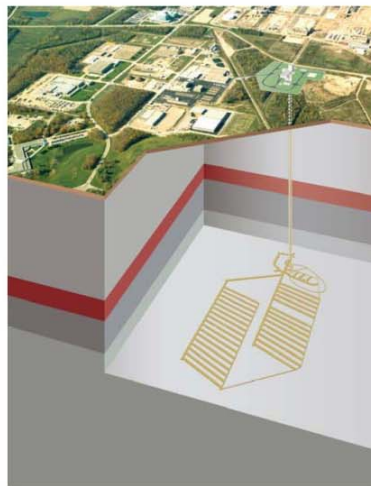
(a) Conceptual Design (2004)



(b) Conceptual Design (2008)



(c) Preliminary Design (2010)



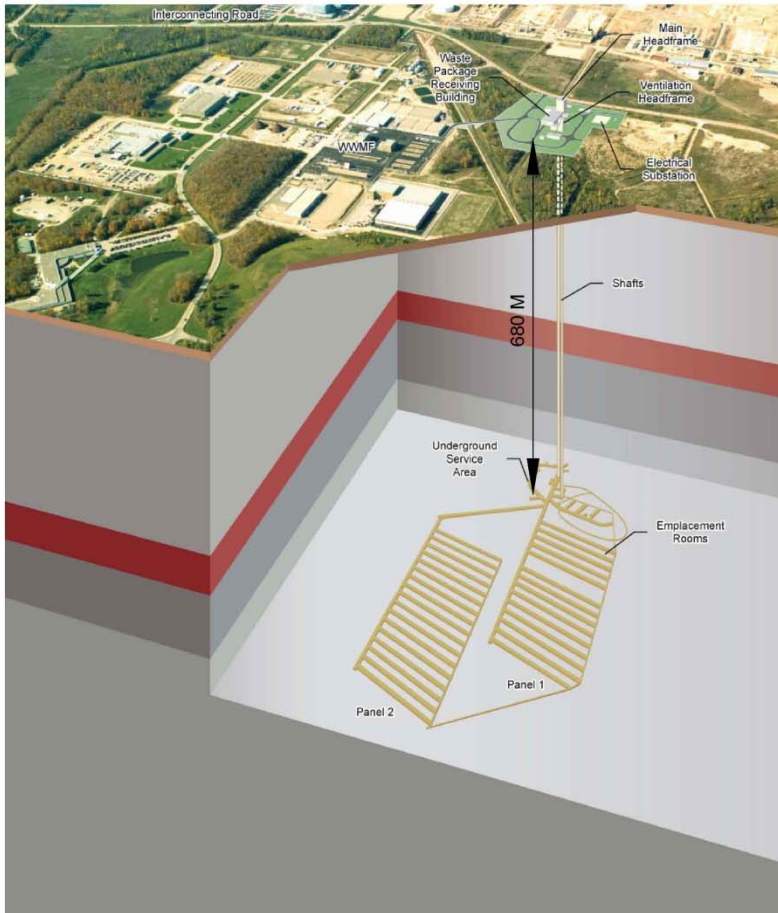
(d) Preliminary Safety Report (2011)

Figure 3.4.5-1: Evolution of the Underground Layout

- Evolution of DGR showing scale

## 2.4 DGR 1





AS PRESENTED IN  
THE OPG EIS, FIG.1.1.1-3

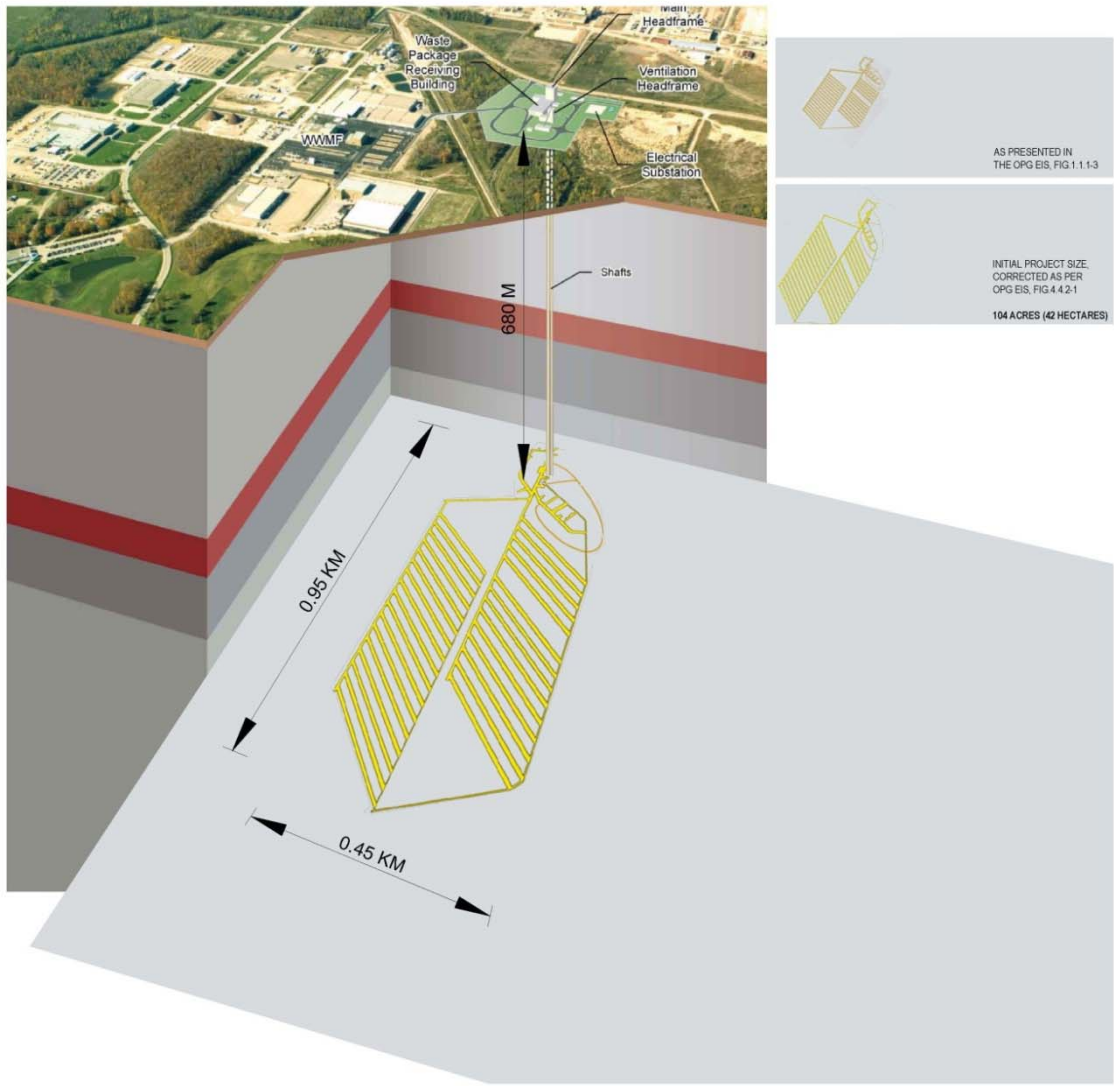
BRUCE PENINSULA DEEP GEOLOGIC  
REPOSITORY 1 (DGR-1) FOR LOW AND  
INTERMEDIATE LEVEL NUCLEAR WASTE

**SCHEMATIC PERSPECTIVE OF THE  
DGR-1 PROJECT AS PRESENTED IN THE  
OPG ENVIRONMENTAL IMPACT  
STATEMENT, FIGURE 1.1.1-3**

**1C**

August 2013

- Comparative scale study
- Typical graphic

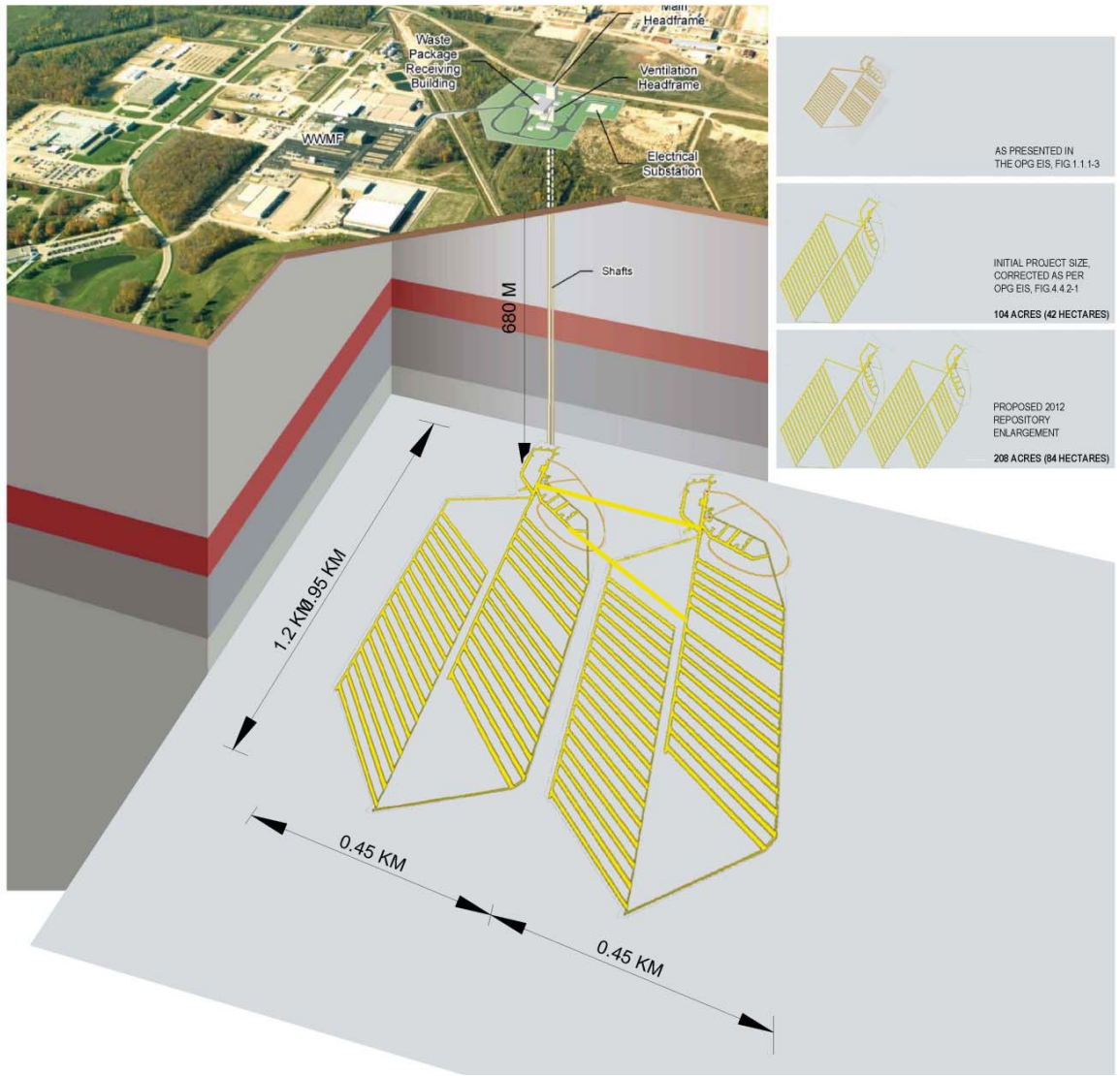


BRUCE PENINSULA DEEP GEOLOGIC REPOSITORY 1 (DGR-1 ) FOR LOW AND INTERMEDIATE LEVEL NUCLEAR WASTE

**CORRECTED PERSPECTIVE OF THE DGR-1 PROJECT**  
**AS REVISED BASED ON FIGURE 4.4.2-1 PRELIMINARY LAYOUT OF THE UNDERGROUND REPOSITORY -OPG DEEP GEOLOGICAL REPOSITORY FOR L+ILW, ENVIRONMENTAL IMPACT STATEMENT, SHOWING THE INITIAL SIZE OF THE PROPOSED UNDERGROUND FACILITY WITH AN AREA OF 103 ACRES (42 HECTARES).**

**2C**  
 August 2013

- Comparative scale study
- Corrected scale



BRUCE PENINSULA DEEP GEOLOGIC REPOSITORY 1 (DGR-1 ) FOR LOW AND INTERMEDIATE LEVEL NUCLEAR WASTE

**CORRECTED PERSPECTIVE OF THE DGR-1 PROJECT**

**AS REVISED BASED ON THE 2012 OPG PROPOSED ENLARGEMENT OF THE UNDERGROUND REPOSITORY. THE INITIAL SIZE OF THE PROPOSED UNDERGROUND FACILITY WAS ENLARGED TO A TOTAL AREA OF 208 ACRES (84 HECTARES).**

**3C**

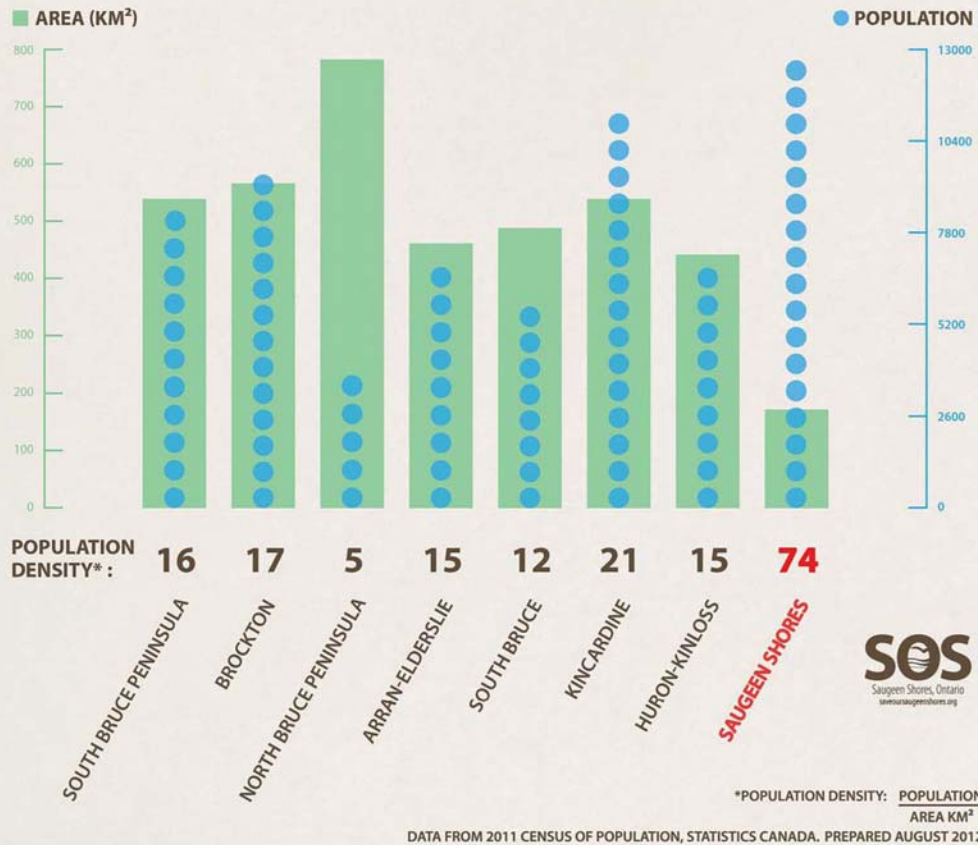
August 2013

- Comparative scale study
- Table 10 4-3 Reasonable Foreseeable Project Description Map No 31
- DGR for Decommissioning Waste of Bruce Nuclear Site



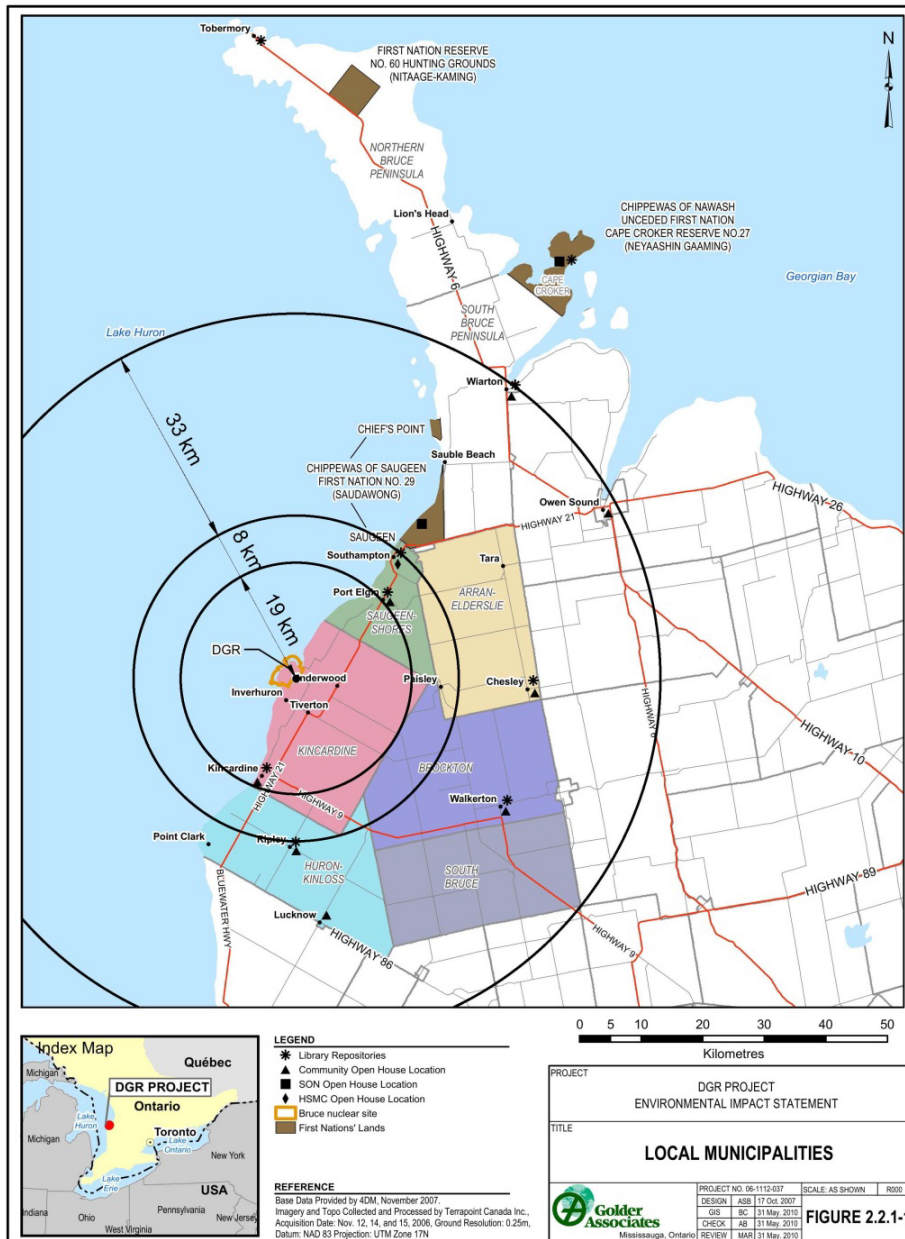
- DGR 1 site superimposed on aerial map of Toronto
- Refer to Table 10 4-3
- Reasonable Foreseeable Project Description Map 31

## BRUCE COUNTY MUNICIPALITIES POPULATION DENSITY

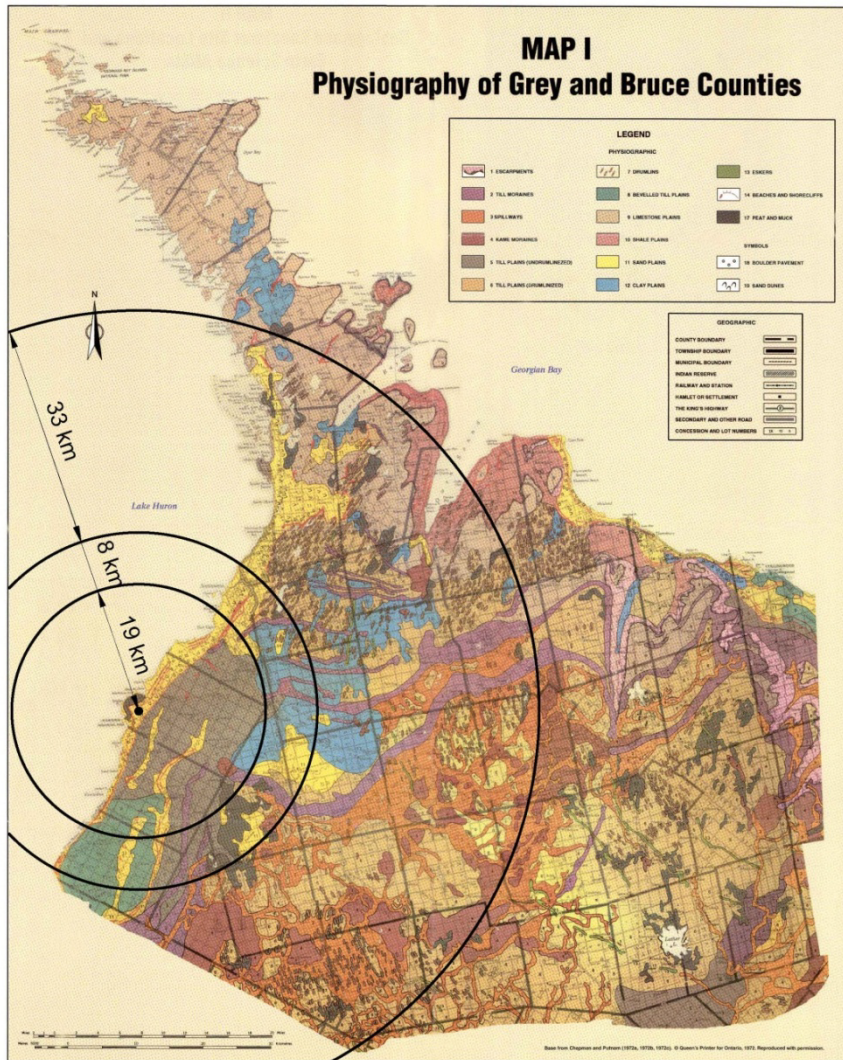


- Population to size comparison between Kincardine and surrounding municipalities

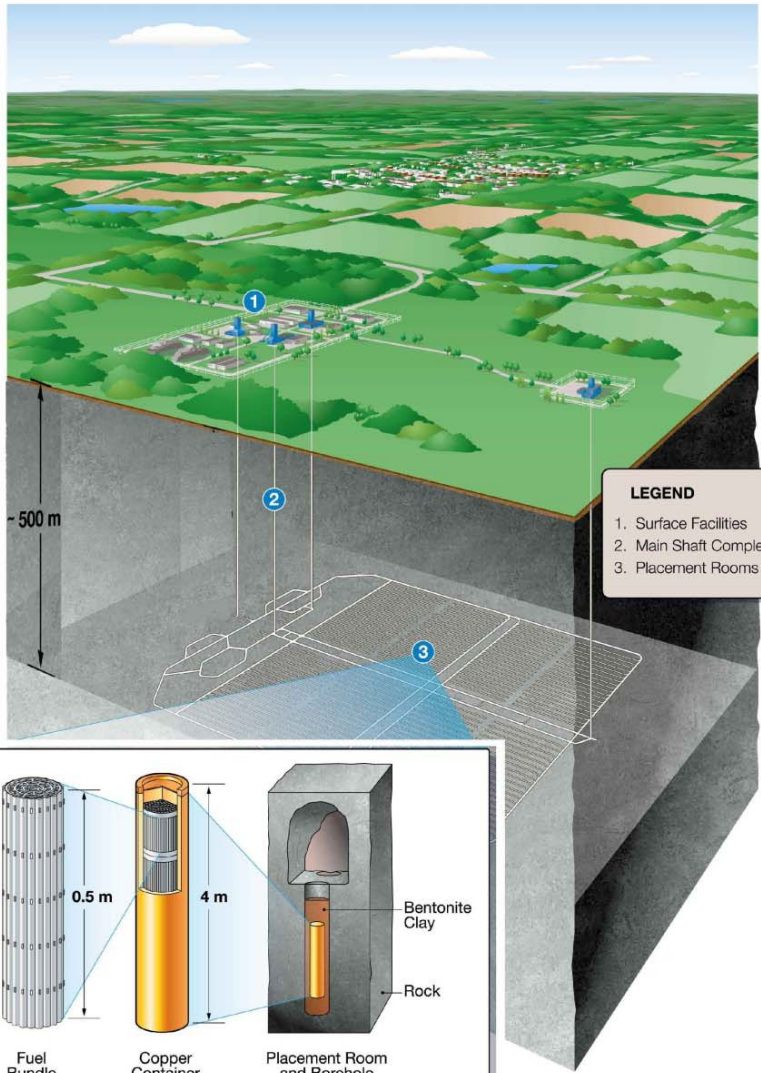
## 2.5 Adjacency and study area



- Proximity studies
- Political boundaries context



- Proximity studies
- Ecological context



AS PRESENTED  
BY NWMO

BRUCE PENINSULA DEEP GEOLOGIC  
REPOSITORY 2 (DGR-2 ) FOR HIGH LEVEL  
NUCLEAR WASTE

**SCHEMATIC PERSPECTIVE OF THE  
DGR-2 PROJECT AS PRESENTED BY THE  
NWMO - 'MOVING FORWARD TOGETHER:  
CANADA'S PLAN FOR THE LONG-TERM  
MANAGEMENT OF USED NUCLEAR FUEL'**

([HTTP://WWW.NWMO.CA/SITINGPROCESS\\_THEPROCESS](http://www.nwmo.ca/sitingprocess_theprocess))

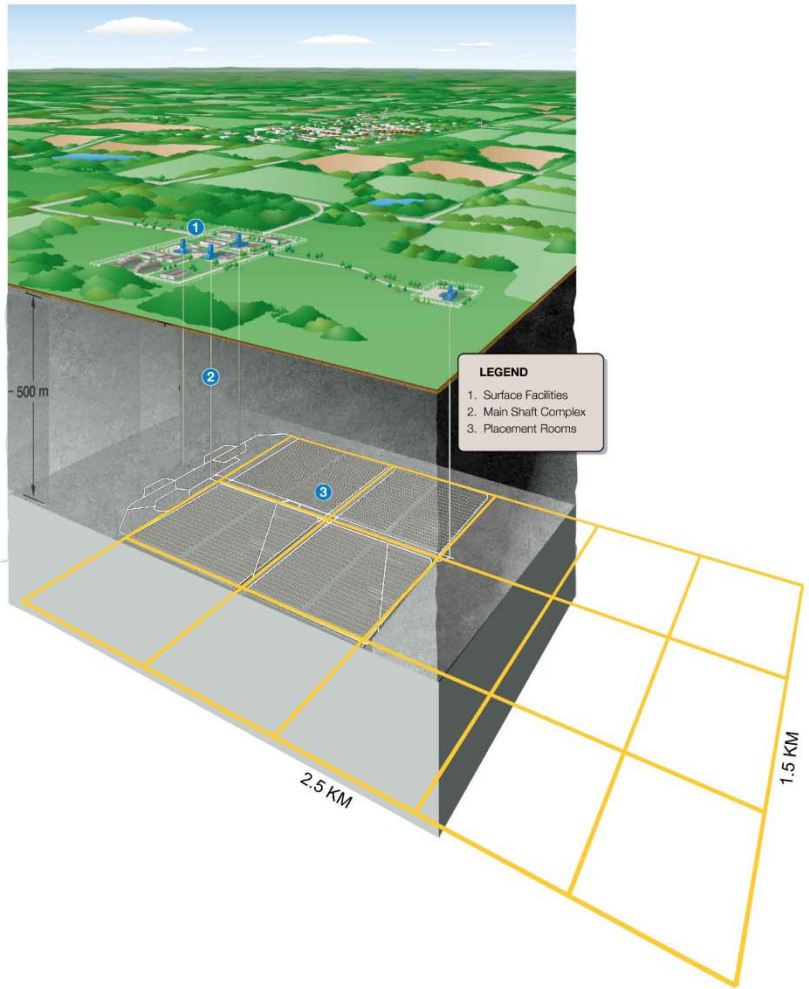
**1D**

August 2013

- **DGR 2 for high level radioactive nuclear fuel**
- **Comparative Scale Study Model as prepared in NWMO characterization in current literature**

## 2.6 DGR 2

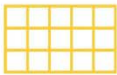




**LEGEND**  
 1. Surface Facilities  
 2. Main Shaft Complex  
 3. Placement Rooms



AS PRESENTED BY NWMO



INITIAL PROJECT SIZE, CORRECTED AS PER PRELIMINARY LAYOUT OF UNDERGROUND REPOSITORY  
 930 ACRES (375 HECTARES)

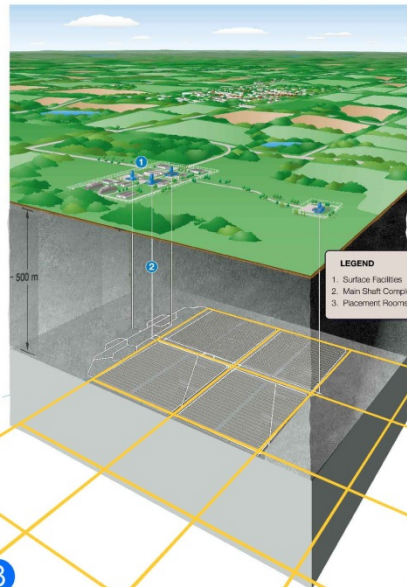
BRUCE PENINSULA DEEP GEOLOGIC REPOSITORY 2 (DGR-2) FOR HIGH LEVEL NUCLEAR WASTE

**CORRECTED PERSPECTIVE OF THE DGR-2 PROJECT**  
**AS REVISED BASED ON PRELIMINARY LAYOUT OF THE UNDERGROUND REPOSITORY -OPG DEEP GEOLOGICAL REPOSITORY FOR HIGH LEVEL NUCLEAR WASTE, SHOWING THE INITIAL SIZE OF THE PROPOSED UNDERGROUND FACILITY WITH AN AREA OF 930 ACRES (375 HECTARES).**

**2D**

August 2013

- Comparative Scale Study Model



AS PRESENTED  
BY NWMO



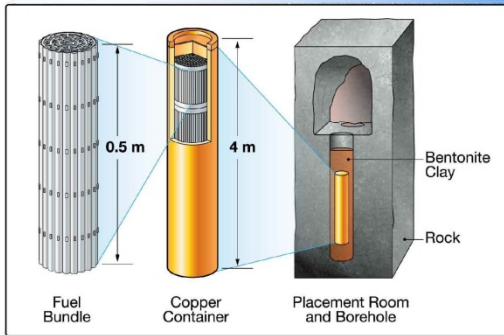
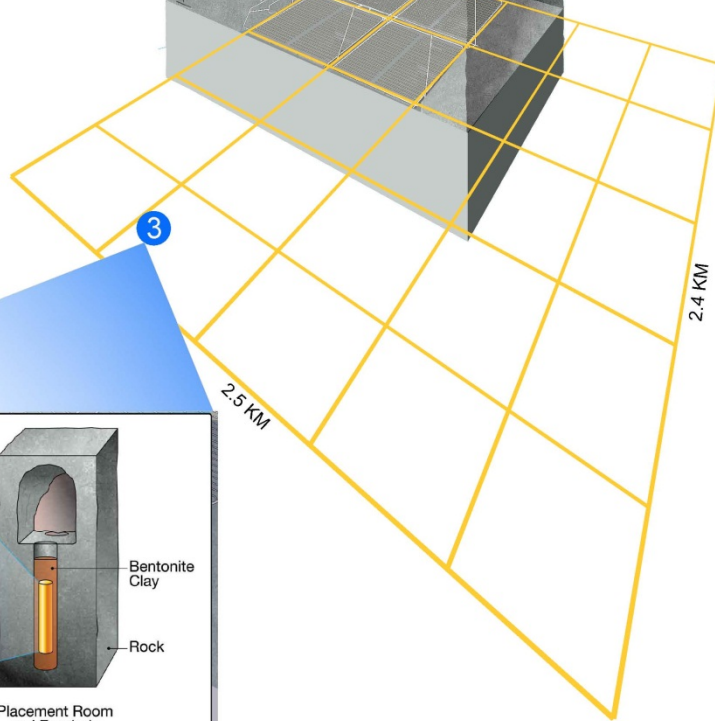
INITIAL PROJECT SIZE,  
CORRECTED AS PER  
PRELIMINARY LAYOUT OF  
UNDERGROUND REPOSITORY  
930 ACRES (375 HECTARES)



PROPOSED 2012  
REPOSITORY  
ENLARGEMENT  
1500 ACRES (600 HECTARES)

BRUCE PENINSULA DEEP GEOLOGIC REPOSITORY 2 (DGR-2) FOR HIGH LEVEL NUCLEAR WASTE

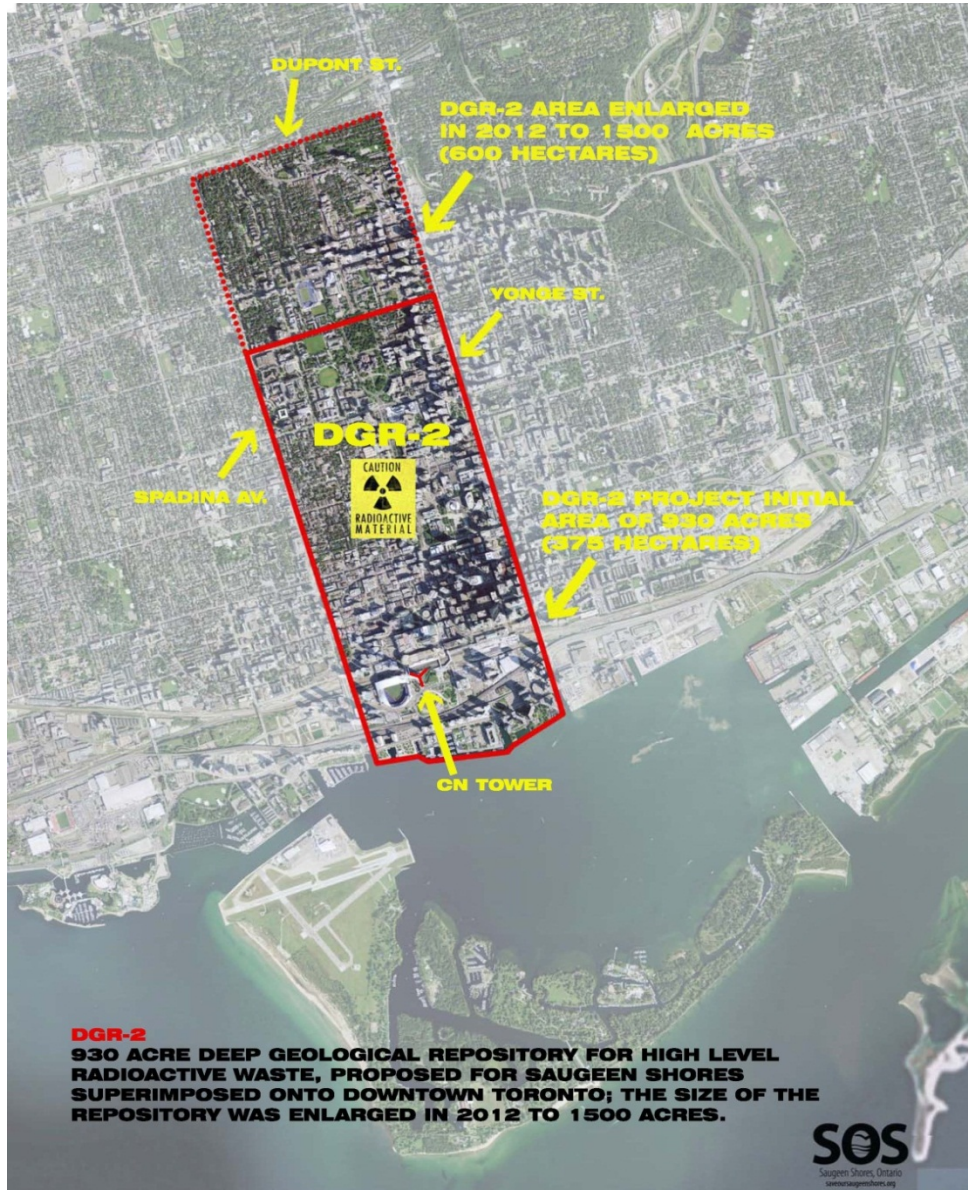
**CORRECTED PERSPECTIVE OF THE DGR-2 PROJECT**  
**AS REVISED BASED ON THE 2012 OPG PROPOSED ENLARGEMENT OF THE UNDERGROUND REPOSITORY.**  
**THE INITIAL SIZE OF THE PROPOSED UNDERGROUND FACILITY WAS ENLARGED TO A TOTAL AREA OF 1500 ACRES (600 HECTARES).**



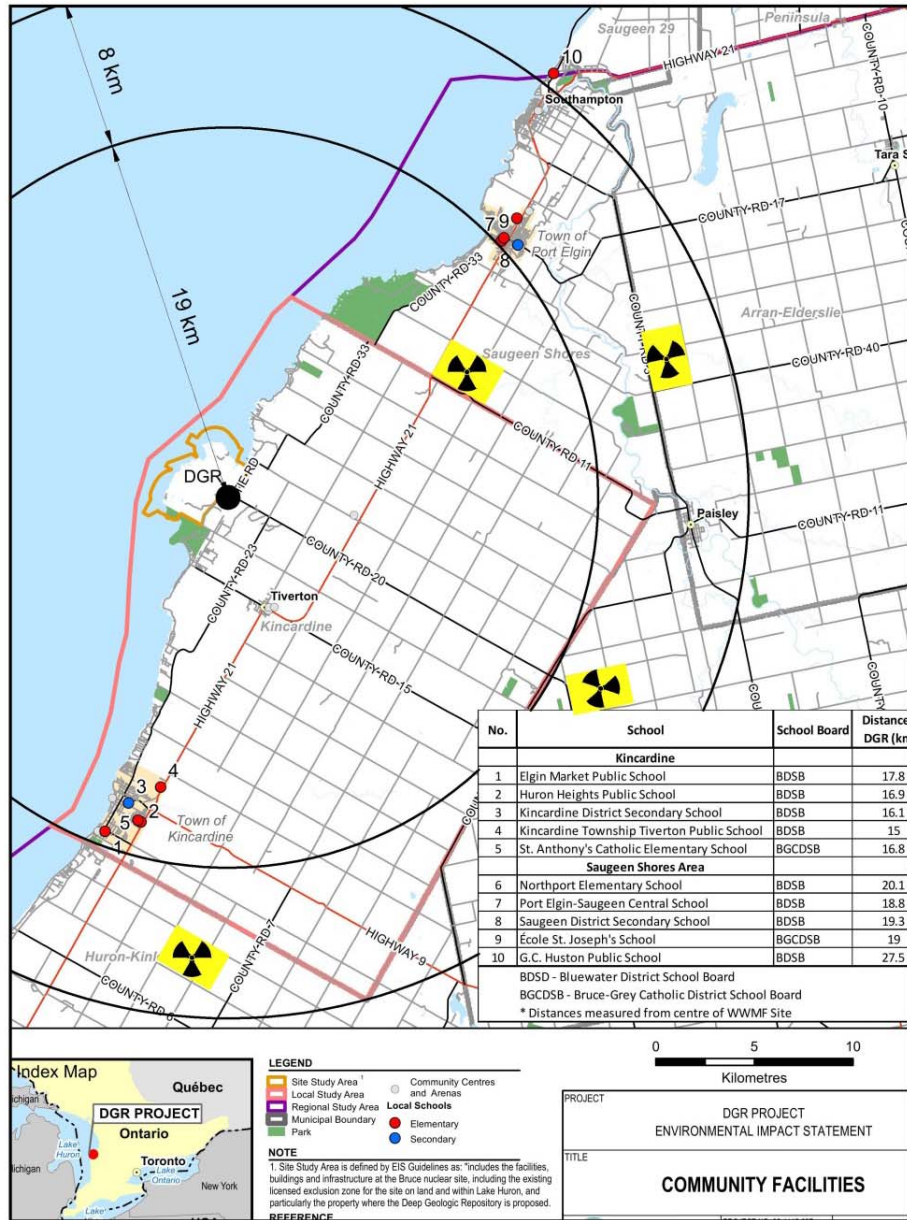
**3D**

August 2013

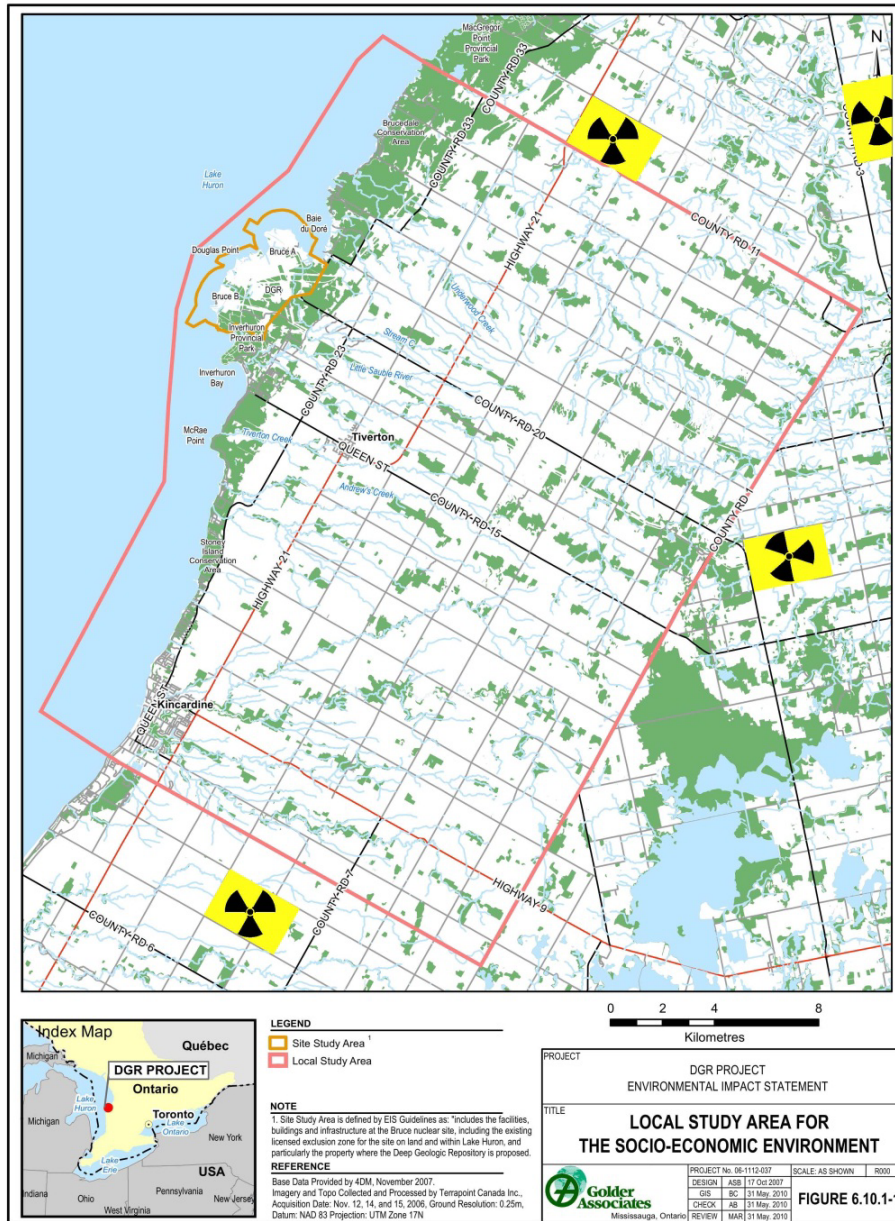
- Comparative Scale Study Model
- NWMO revised DGR 2 2012



- DGR 2 superimposed on aerial map of Toronto
- Scale
- Increasing size
- Toxicity
- Cumulative effect
- Stigma



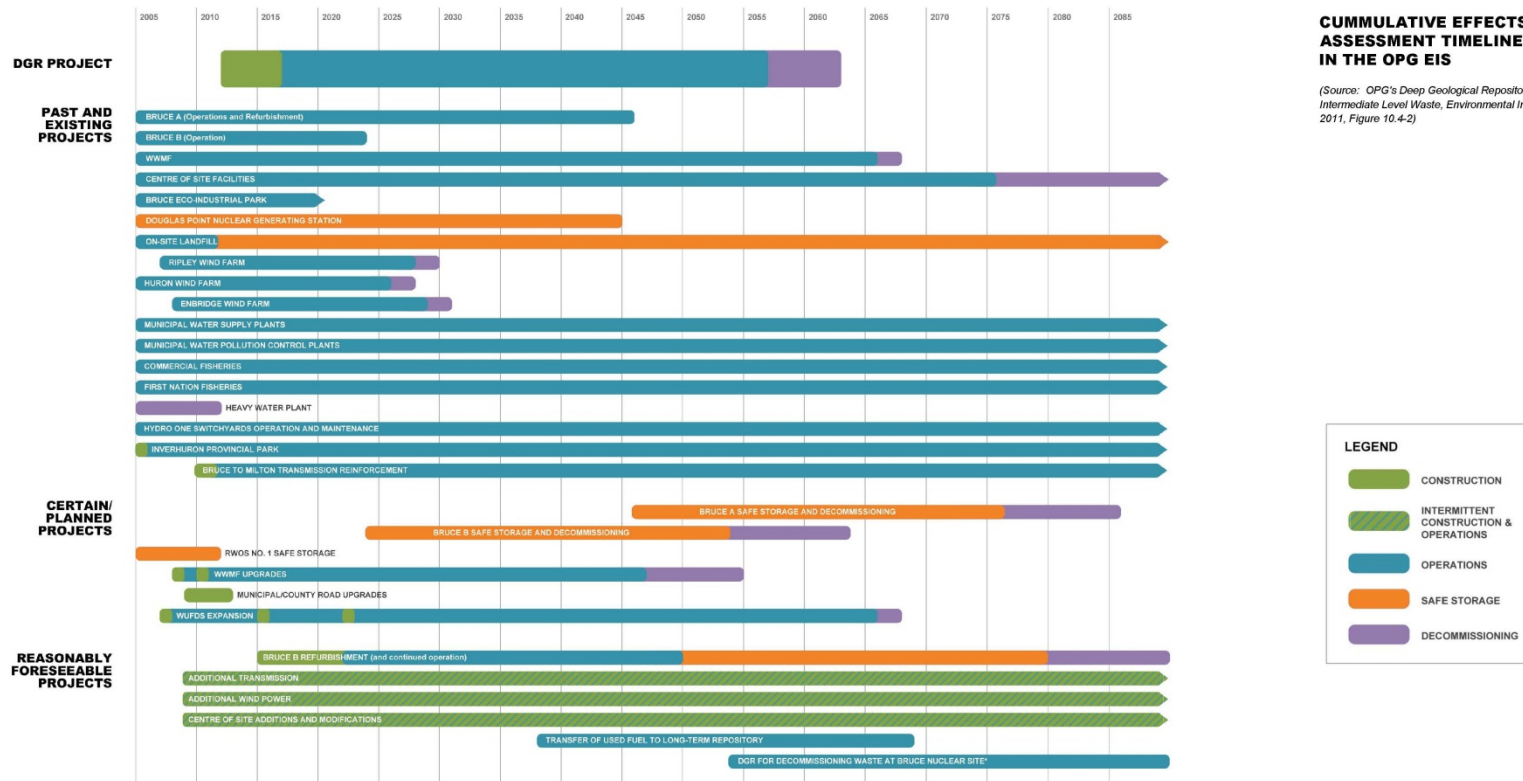
- Proximity studies
- DGR 2
- Cumulative effect



- Proximity studies
- DGR 2
- Cumulative effect

**CUMMULATIVE EFFECTS  
ASSESSMENT TIMELINE AS PRESENTED  
IN THE OPG EIS**

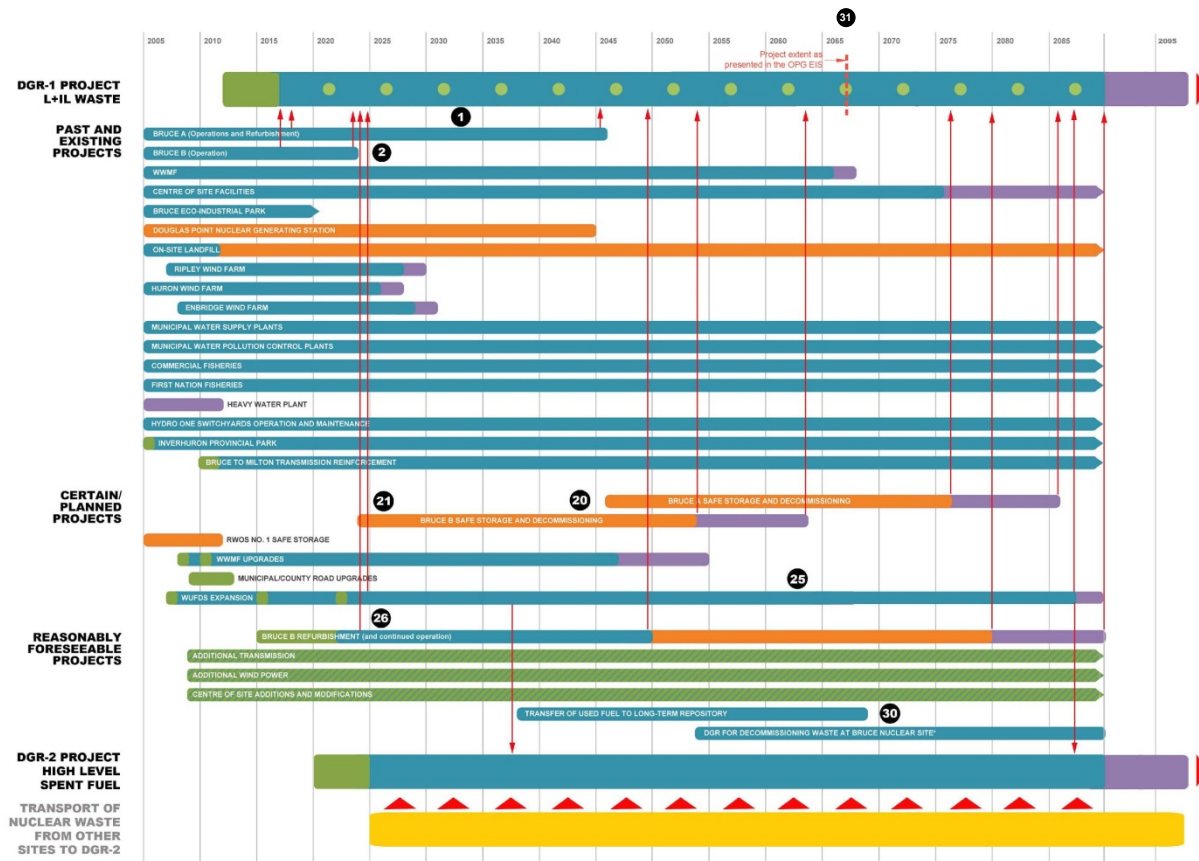
(Source: OPG's Deep Geologic Repository Project for Low and Intermediate Level Waste, Environmental Impact Statement, March 2011, Figure 10.4-2)



Note: \* Not a planned activity; included to meet EIS Guideline requirements

Figure 10.4-2: Cumulative Effects Assessment Timeline

- Cumulative effects
- Project timeline
- Missing factors
- Decommissioning waste and DGR 2



BRUCE PENINSULA DEEP GEOLOGIC REPOSITORY 1+2 (DGR-1 + DGR-2) FOR LOW AND INTERMEDIATE LEVEL NUCLEAR WASTE

**CORRECTED CUMMULATIVE EFFECTS ASSESSMENT TIMELINE**

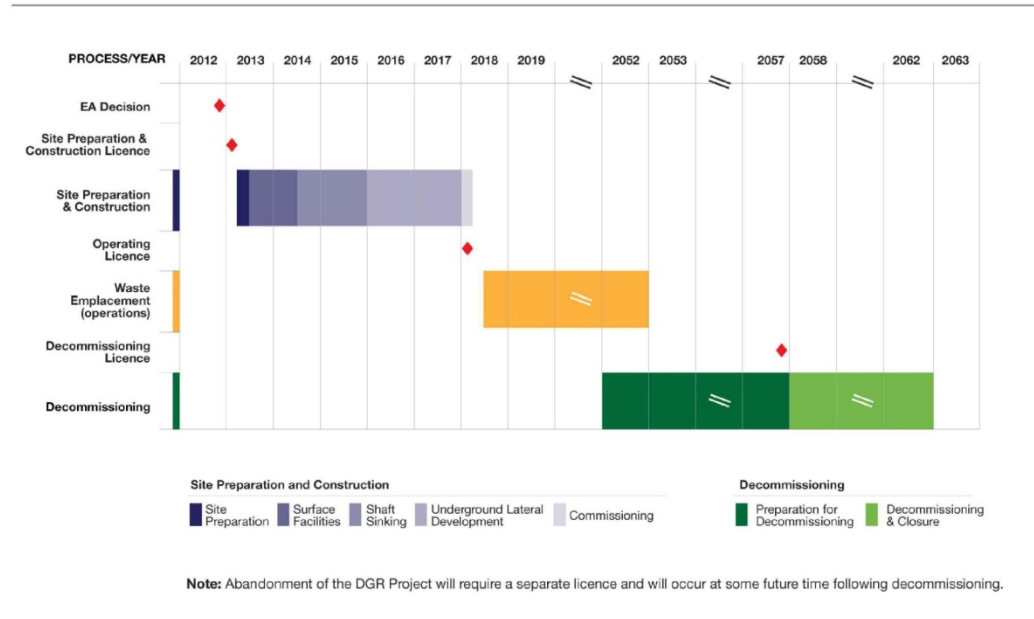
**AS REVISED BASED ON TABLE 10.4-1 PAST AND EXISTING PROJECT DESCRIPTION -OPG DEEP GEOLOGICAL REPOSITORY FOR L+ILW, ENVIRONMENTAL IMPACT STATEMENT SHOWING TRANSFER OF L+ILW TO DGR-1 AND HIGH LEVEL WASTE FUEL STORED + DECOMMISSIONED FACILITIES OF BRUCE SITE AND OTHER NUCLEAR FACILITIES TO DGR-2.**



- Adjusted cumulative effects timeline based on Table 10 4-3 Reasonable Foreseeable Project Description Maps 1, 2, 20, 21, 25, 26, 30 & 31
- Extended constructive impact on commissioning and ecology

**TIMELINE FOR PROJECT  
IMPLEMENTATION AS PRESENTED IN  
THE OPG EIS**

*(Source: OPG's Deep Geological Repository Project for Low and Intermediate Level Waste, Environmental Impact Statement, March 2011, Figure 4.2-1)*



**1A**  
August 2013

Figure 4.2-1: Timeline for Project Implementation

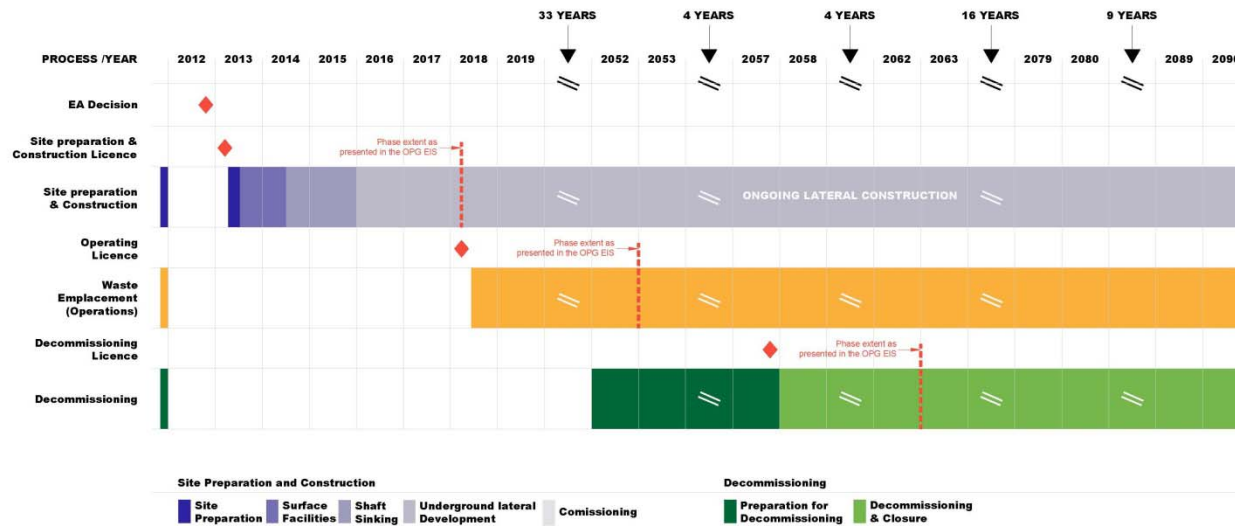
- EIS timeline
- Sequential scheduling

2.8 DGR 1 Construction Schedule



BRUCE PENINSULA DEEP GEOLOGIC  
REPOSITORY 1 (DGR-1) FOR LOW AND  
INTERMEDIATE LEVEL NUCLEAR WASTE

**CORRECTED TIMELINE FOR PROJECT  
IMPLEMENTATION**



Note: Abandonment of the DGR 1 project will require a separate licence and will occur at some future time following decommissioning.



**2A**

August 2013

- Project implementation EIS timeline adjusted to reflect adjusted site activity noted in Table 10 4-3 Reasonable Foreseeable Project Description Maps 1, 2, 20, 21, 25, 26, 30 & 31
- Additional cumulative effect

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Yours truly,

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<sup>8</sup> NWMO, "L Processes  
<sup>9</sup> Case Studie

<sup>5</sup> NWMO, Study)"  
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<sup>3</sup> Nuclear fuel d of the Act, pu government it jurisdiction of if the propose

<sup>4</sup> *Tellier v. Sain* (1919), 59 SC Galt-Canadian City Develop Thomas (City) No. 252.

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<sup>1</sup> NWMO, Reposit

<sup>2</sup> *Vanderschot, Home & Dempsey v. North Easthope (Township)*, [1995] O.J. No. 4820; *Grand Trunk R.W. Co. v. Toronto (City)*, [1900] O.J. No. 96.

May 10, 2012

VIA EMAIL

Mr. Charles Hazell  
2 Peel Street  
Southampton  
Saugeen Shores ON N0H 2L0

Dear Mr. Hazell:

Re: Town of Saugeen Shores Deep Geological Repository for Used Nuclear Fuel Site Selection Process

We understand that the Town of Saugeen Shores (the "Town") is considering entering Step 2 of the site selection process (the "Site Selection Process") for a Deep Geological Repository for Used Nuclear Fuel (the "Project") conducted by the federal Nuclear Waste Management Organization ("NWMO"). It is our understanding that this Project would require 950 acres of land in order to be built.

You have requested that we provide you with our legal opinion respecting two issues impacting any decision the Town may make with respect to the Site Selection Process: (1) whether the Town has the legal authority to enter into the Site Selection Process; and (2) if Yes to (1), what would be required for the Town to demonstrate that it is a "willing host community."

We have reviewed various documents on the NWMO Site Selection Process and conclude that the Town presently lacks any legal authority to enter into the Site Selection Process.

1.0 Legality

We have reviewed the Site Selection Process, and other relevant documents and have concluded that the Town presently lacks the legal authority to enter into the Site Selection Process for two reasons: (1) the Site Selection Process appears to be contrary to constitutional and municipal law; and (2) any Town decision at this time would fail to be consistent with the 2005 Provincial Policy Statement (the "PPS") and thus contrary to ss. 3(5) and 3(6) of the *Planning Act*, R.S.O 1990 c. P.13 as amended (the "*Planning Act*").

Reply To: Rodney V. Northey  
Direct Dial: 416.941.8880  
E-mail: [northey@foglers.com](mailto:northey@foglers.com)

Reply To: Konstantine J. Stavrakos  
Direct Dial: 416.365-3709  
E-mail: [kstavrakos@foglers.com](mailto:kstavrakos@foglers.com)  
Our File No. 122650

- Legal opinion
- Unresolved issues
- Provincial jurisdiction

2.9 Legal opinion

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

English (CA)

Completed  Not Yet Begun

Current Interim Storage of Low and Intermediate Level Waste

**Kincardine and Ontario Power Generation Study of Long-Term Options**

- Kincardine/Ontario Power Generation Sign Memorandum of Understanding
- Kincardine and Ontario Power Generation Initiate Independent Assessment Study
- Conduct Geotechnical Feasibility Study
- Conduct Preliminary Safety Assessment
- Conduct Social Assessment
- Conduct Economic Analysis
- Conduct Environmental Protection Feasibility Study
- Carry Out Consultation in Communities

**Independent Assessment Study Report**

**Seek Community Agreement**

- Kincardine and Ontario Power Generation Develop Community Offsets and Benefits Plan
- Community Discussions and Decision

Positive Result in Referendum?

No → OPG Considers Alternatives

Yes →

**Conduct Environmental Assessment**

- Design of Selected Option
- Carry Out Environmental Assessment Studies and Consultation
- Prepare and Submit Environmental Assessment Study Report
- Public Review

Environmental Assessment Accepted?

No → OPG Considers Alternatives

Yes →

**Seek Construction and Operating Approvals**

- Prepare Facility Safety Report
- Application to Canadian Nuclear Safety Commission for Site/Construction Approval
- Application to Canadian Nuclear Safety Commission for Operating Licence

Canadian Nuclear Safety Commission Issues Licence?

No → OPG Considers Alternatives

Yes → Operating Long-Term Waste Management Facility

**Project Schedule**

In 2010, after more than four years of studies, investigations and analyses, the DGR environmental assessment(EA) was completed. Detailed findings of the DGR EA are presented in the Environmental Impact Statement (EIS) and Technical Support Documents. These documents, along with the Preliminary Safety Report and supporting documents, were submitted to the Joint Review Panel on April 14, 2011.

Following the public comment period - which was open from February 3, 2012 to May 24, 2013 - the Joint Review Panel announced the start of the public hearing will be in September at the following two locations - September 16 to October 5 at the Royal Canadian Legion in Kincardine and October 7 to October 12 at the Saugeen Shores Community Complex.

Notification of the EA decision and licence approval for site preparation and construction is anticipated in 2014.

**DGR Contact Information**  
Contact information for the DGR project is:

Box 7000, 821  
Tiverton, Ontario  
N0G 2T0 Canada  
Tel: 519.365.1533  
Fax: 519.365.1507  
Email: dgrinfo@ogog.com

STEP4  
TERMS OF USE  
PRIVACY NOTICE  
CONTACT US

Aug-27-2013 11:39:39 AM EDT  
© 2010 Nuclear Waste Management Organization

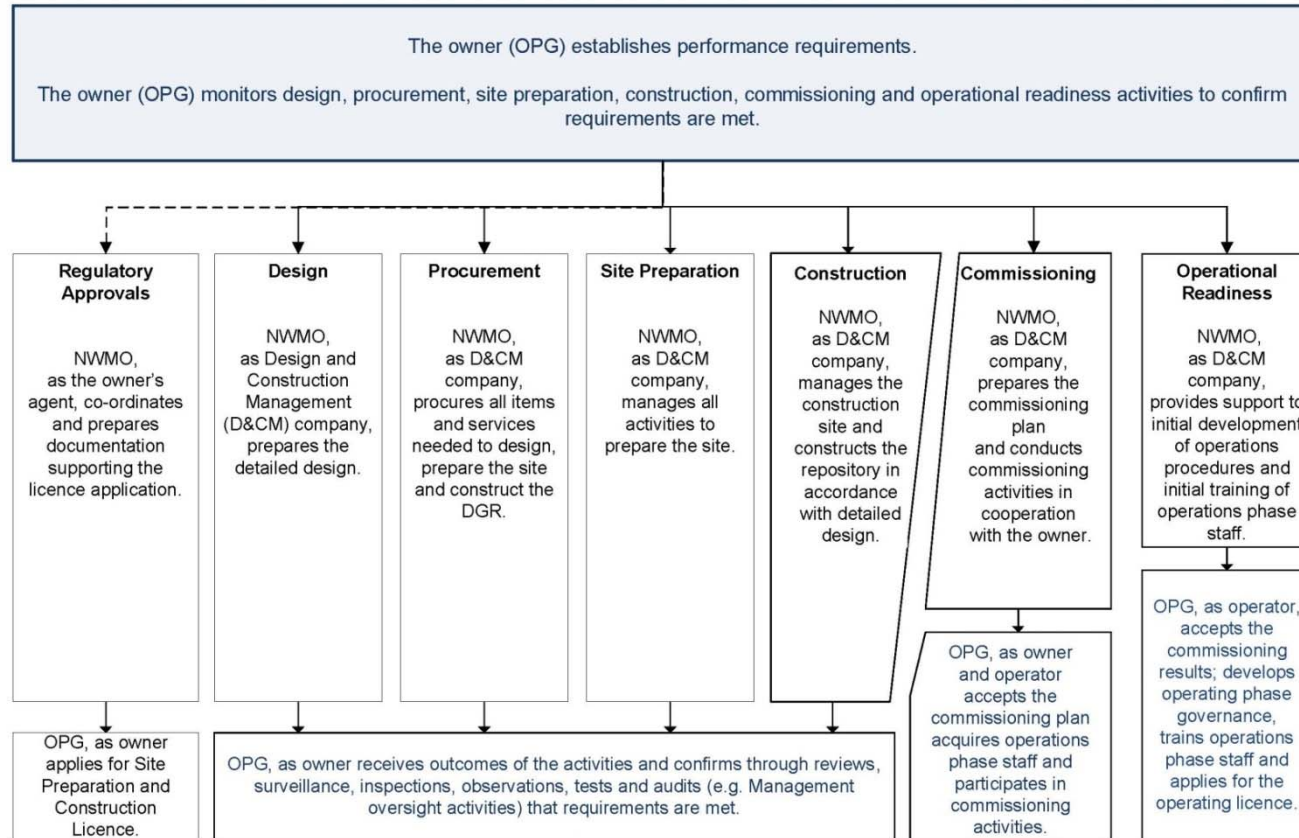
4

For additional information contact:  
Duncan Moffett at Golder Associates Ltd. [dmoffett@golder.com](mailto:dmoffett@golder.com) 1-800-414-8314

- Project schedule
- EIS approval
- Corporate culture

## 2.10 NWMO management team

Title: <b>DESIGN AND CONSTRUCTION PHASE MANAGEMENT SYSTEM</b>		Security Classification: <b>Public</b>	
Document No.: DGR-PD-EN-0001	Revision: R000	Date: Feb. 18, 2011	Page: 7 of 34



**Figure 1: NMWO Management Model for OPG's DGR L&ILW Prior to DGR Operations**

- **Credibility**
- **Advancing to design and construction**
- **Risk**

## » CANADA



Thomas Walkom

## Wind turbine reforms fail to quell anger of rural voters

After years of dismissing rural opposition to wind turbines, Ontario's Liberal government is belatedly trying to defuse the problem. Its efforts may be too little. They are definitely late.

In cities, the giant, industrial three-blade windmills are back of mind. When, as has happened in Toronto, urban voters do object to wind turbines, the Liberal government is quick to back off.

But most wind farms are slated for rural Ontario. And here, the government, until now, has been unbending. It refused to accept persistent claims from local residents that wind farms put their health at risk. It overruled municipalities that tried to regulate or ban turbines.

Instead, in virtually all cases, the Liberals sided with the big, private generating companies seeking to establish these profitable wind farms.

No wonder, then, that the Liberals were virtually wiped out in rural



COLIN MCCONNELL/TORONTO STAR FILE PHOTO

Opposition to wind farms in rural Ontario shows no signs of cooling, Thomas Walkom writes. Above, a 2012 protest.

Ontario during the last election. Wind turbines helped to deprive them of their last footholds.

The new premier, Kathleen Wynne, has been trying to fix that.

But the Wynne government's efforts to date are grudgingly minor. A new policy outlined by Energy Minister Bob Chiarelli last week would require large wind-farm proponents to "work directly with" municipalities on where to locate any new turbines.

But there is no suggestion that municipalities would be given the power to veto or otherwise regulate schemes they dislike.

Municipalities would also be permitted to tax wind farms more

heavily. And when considering small projects of up to 500 kilowatts generating capacity, the government has promised to give priority to those in which municipalities have a monetary stake.

In short, the government is handing municipal politicians a few goodies in the hope of bringing them onside.

But in a CBC radio interview following his announcement, Chiarelli made it clear: Queen's Park still reserves the right to authorize more large-scale, private wind farms, even if local residents and councils are opposed.

Ironically, the government continues to defend its green energy policy

at a time when, in one important regard, it is no longer relevant.

As first envisioned, the Liberals' Green Energy Act was part of a bold industrial strategy.

By subsidizing wind and solar power, the government hoped to break Ontario's dependence on carbon-emitting coal.

Equally important, however, was a rule that required 60 per cent of all equipment used by solar and wind generators to be Ontario-made. The aim here was to create a vibrant, green manufacturing sector.

Last month, in a devastating blow to the Liberal industrial strategy, that 60-per-cent domestic content requirement was ruled invalid by a

World Trade Organization appeal panel. Ontario, the WTO said, may not prevent private power generators from buying foreign-made equipment.

The government still talks optimistically about Ontario green manufacturers holding their own against cheap offshore imports. We shall see how that works out.

As for the politics of wind, Chiarelli may have succeeded in soothing the egos of municipal politicians. But at a popular level, the anger over turbines shows no sign of abating.

Indeed, for a government trying to present itself and its wind-turbine allies as sensitive to the needs of ordinary people, matters just keep getting worse.

This week, the London Free Press reported that the Florida-based energy giant NextEra Energy is suing a local anti-turbine activist and rock garden enthusiast named Esther Wrightman.

Wrightman's alleged offence is that on her blog she referred to the company, which has proposed wind turbine projects in the London, Ont., area, as NextTerror.

In its statement of claim, which has not been proven in court, NextEra says it "has committed no acts of terror or violence."

The London Free Press calls it a David-versus-Goliath battle. Almost certainly, that is how this will be viewed in the countryside — with the Liberal government firmly on Goliath's side.

Thomas Walkom's column appears Wednesday, Thursday and Saturday.

- Shift in societal values and provincial legislation
- Direct community action

### 3. TRENDS

#### 3.1 Accountability and societal shift

## ENERGY INFRASTRUCTURE

# Ontarians to get a say on location of power plants

**ADRIAN MORROW**

The Ontario government will draw up new rules to make sure local residents have a say in where future power plants and other energy infrastructure is built, in a bid to avoid a repeat of the costly cancellation of two gas plants before the 2011 election.

In a letter to the Ontario Power

Authority and the Independent Electricity System Operator, Energy Minister Bob Chiarelli ordered the two agencies Monday to prepare a report for him on what the new rules could look like. The report is due Aug. 1.

The directive comes just a day before former premier Dalton McGuinty is scheduled to testify before a legislative committee

investigating the plant cancellations.

The committee has already heard that Mr. McGuinty made the decision to cancel the plants, in Oakville and Mississauga. In the case of the Mississauga project, Mr. McGuinty is said to have overruled his own energy minister in deciding the plant had to go.

The cancellations, which cost

an estimated \$585-million, were widely seen as a ploy to win area seats.

Premier Kathleen Wynne has said that the problem was that the Liberal government allowed the plants to be located in communities that did not want them in the first place.

"I very much regret that we're in this situation and I take responsibility for providing all the

information and making sure that, more importantly, making sure that, as we go forward, this doesn't happen again," she said Monday.

In his letter, Mr. Chiarelli told OPA and IESO to recommend a process for the government to consult with municipalities, aboriginal groups and others on regional energy plans and on the locations of new power plants.

- **Enough infrastructure and governance**

## SAFETY REGULATIONS

# Mayors seek role in new railway rules

'The rails go through our municipalities. ... We're able to sometimes question the quality of it,' says the mayor of Bromont, Que.

**BILL CURRY OTTAWA**

Canada's mayors want a say in new federal rail-safety rules in light of the destruction caused by the Lac-Mégantic disaster.

A small group of mayors from across the country held their first conference call Monday as part of a new working group on rail safety. Pauline Quinlan, the mayor of Bromont, Que., and co-chair of the Federation of Canadian Municipalities working group, said Ottawa needs to involve mayors because they see the conditions of Canada's rail lines first-hand.

Bromont is similar in size to Lac-Mégantic and is also along the rail line served by the Montreal, Maine & Atlantic Railway, the company at the centre of the

July 6 derailment that killed 47 people and destroyed the town's core.

"The rails go through our municipalities. We're able to see it. We're able to sometimes question the quality of it," Mayor Quinlan said. Still, she said Canadian municipalities understand the importance of these rail lines.

"The railway system is very important to develop our economy," she said. "I've not seen a municipality say, 'Let's get rid of the railroad and let's do something else.'"

The FCM working group issued a statement calling on Ottawa to respond to safety recommendations made by the Transportation Safety Board, which is investigating the causes of the disaster.

Also on Monday, the Quebec government issued a legal notice demanding that the companies involved in the derailment cover the full cost of the cleanup. The legal notice was sent to MM&A, Western Petroleum Company and World Fuel Services.

The federal government is responsible for regulating rail safety, but municipal fire and police officials are often first on the scene in the event of an accident.

Municipal frustration boiled over during the June flooding in Calgary, when a Canadian Pacific Railway train derailed, leaving six train cars carrying petroleum hanging on a partially collapsed bridge. Calgary Mayor Naheed Nenshi told reporters at the time that it was a "constant frustration" for municipalities that they

have no say or control over the rail companies that run through their communities.

"How is it we don't have regulatory authority over this, but it's my guys down there risking their lives to fix it?" the mayor fumed. "We have to have a serious conversation about this."

Mr. Nenshi was chairing a council meeting Monday and was not available to comment on the latest push by the FCM for a greater say over rail safety rules.

Last week, Transport Canada issued an emergency directive that requires all rail operatives to have at least two qualified people on board when transporting dangerous goods. It also updated the rules related to handbrakes and securing unattended trains. The directive came four days

after the Transportation Safety Board said it had identified two safety issues that required immediate attention.

New federal Transport Minister Lisa Raitt met last week with several Quebec mayors, including Ms. Quinlan, to discuss rail safety. A spokesperson for the minister said another meeting is scheduled this week with FCM president Claude Dauphin, the mayor of Lachine, Que.

"The minister is committed to working with any party on promoting rail safety," wrote Ashley Kelahear in an e-mail. "The government of Canada has acknowledged that the Transportation Safety Board of Canada plays an important role in enhancing safety by identifying areas where improvements can be made."

- Direct municipal involvement and influence
- Active interest
- infrastructure

# Plan to ship nuclear waste shelved

Massive decommissioned generators would have passed through the Great Lakes

**ROB FERGUSON**  
QUEEN'S PARK BUREAU

Opponents of a failed push by the Bruce Power nuclear plant on Lake Huron to ship radioactive steam generators to Sweden say they're carefully watching for the company's next move.

Bruce Power has quietly shelved its widely opposed plan to float the 16 huge machines out the Great Lakes and St. Lawrence Seaway to the Atlantic, with spokesman John Peevers saying Monday that Bruce "will continue to explore options."

The company's approval from the Canadian Nuclear Safety Commission to make the massive shipment expired Feb. 3, 2012 — which came to light again after the Swedish contractor, Studsvik, revealed the situation in a report earlier this month.

"This will not proceed on the timetable initially contemplated," Peevers acknowledged in an email Monday. "Bruce Power believes in the



Bruce nuclear plant had received permission to move the radioactive steam generators without hearings, which infuriated environmental activists.

waste management principles of reduce, reuse and recycle."

He did not return calls from the Star asking what recycling options or timelines Bruce Power is considering for the decommissioned generators, which are 30 years old. Each is roughly the size of a school bus.

Sarnia Mayor Mike Bradley, whose city is a two-hour drive south of the plant at Tiverton, Ont., said he and other opponents of the shipment, including the Council of Canadians, New Democrats and First Nations bands, are waiting to see what Bruce Nuclear wants to try next.

"They took a combative stance and it backfired," he said of Bruce Power and its efforts to follow through on the shipments despite environmental concerns.

"Their original plan was to recycle on site," Bradley added, saying he hopes the failure of the shipment plan is a "nail in the coffin" for the idea. Bruce Power said it will keep the community informed of future plans for the generators.

Throughout the process, the company maintained that shipping the generators would be safe because they contained low-level radiation

within regulatory limits. About 90 per cent of the metals in the machines can be decontaminated, melted down and sold for scrap.

"If the very unlikely scenario occurred where the ship sank and the (generator) vessels were somehow breached, the very low levels of radiation would be diluted even further by the large volume of water and would result in a level that we believe would not even be measurable," Bruce Power said in a July 2010 statement.

The generators have been stored in a concrete warehouse at the Bruce plant. Bruce Power got permission for the shipment from the Canadian Nuclear Safety Commission without hearings or an environmental assessment, which infuriated environmental activists.

They feared an accident could leave Lakes Huron, Erie and Ontario — the source of drinking water for millions — contaminated with radiation.

People need to have more respect for the lakes, said Bradley, whose city is the largest on Lake Huron.

"The biggest invasive species on the Great Lakes is man."

- Responsible governance
- Societal expectations
- Great lake advocacy



# Nuclear fuel DGR near Huron shore is 'insanity': Barlow

SARAH SLOAN  
QMI Agency

The debate about a deep geological repository for used nuclear fuel should start from the ground up, Maude Barlow told some 300 people at a Great Lakes Need Great Friends meeting put on by Save Our Saugeen Shores at The Plex in Port Elgin.

Barlow, the national chairperson of the Council of Canadians and a former United Nations senior advisor on water, made a stop in Saugeen Shores last week as part of a seven-city tour speaking in defence of the Great Lakes.

SOS invited Barlow and a panel of five speakers to highlight issues facing the Great Lakes such as low water levels, the threat of nuclear waste disposal and increasing pollution.

A standing room only crowd at Thursday's event heard from Mary Muter of Sierra Club Canada, Saugeen First Nation Chief Randall Kahgee, Sarnia Mayor Mike Bradley and Brockton Coun. Chris Peabody.

"I think it has been accepted now that this lesson that we learned back in Grade 6, that we can't run out of water... is actually not true," Barlow began.

See SOS, page A2

FROM PAGE 1

"We are actually a planet running out of available fresh water."

"We are literally over-extracting our rivers to death and we are now mining our groundwater using technology that didn't exist before the 1950s" and has been improved upon since, Barlow said. "One global study tells us we are doubling the groundwater takings every 20 years around the world."

Aquifers are being drained faster than they can be replenished, Barlow said there are studies by water intensive companies, such as bottled water companies, which say by 2030 the demand for water in the world will outstrip supply by 40%.

"It's really hard to get a handle on what that means," she said. "But it means a lot of people are going to die, a whole lot of species are not going to make it."

Barlow and members of the panel touched on other issues such as fracking, tar sands, pipelines and crude oil transfers across the Great Lakes to the St. Lawrence.

"Now, of course, we have the threat of nuclear waste... and this comes straight to the shores of our Great Lakes," she said, crediting SOS for taking a stand against the DGR. "I don't know how to say this other than... this is an act of insanity. This would be a crime against future generations, this is a crime against nature."

Barlow said the DGR debate is not a left-right issue, but rather an issue of common sense, of survival. "We know what's in this nuclear waste... and to even conceive burying it within one kilometre of these lakes is absolutely the most terrible idea I can think of."

Like SOS, Barlow said more people need to make a stand within Saugeen Shores and that people worldwide need to start looking at water in a profoundly different way.

"Water is a human right that needs to be shared more equitably and justly," she said. "It is a common heritage and a public trust and that no one should be able to own it, pollute it, displace it or dis-manage it for personal profit when the common good is suffering."

Bradley agreed with Barlow, saying "we cannot keep playing Russian roulette with the Great



Maude Barlow, author, activist and national chairperson of the Council of Canadians, left, speaks with members of the audience who attended the Great Lakes Need Great Friends meeting in Port Elgin last Thursday.

SARAH SLOAN QMI Agency

Lakes. We can't keep on doing this.

"The most invasive species on the Great Lakes is man," he said. "There are two fronts on this and the one front we have not approached yet is the political front. I think what you need to do is ensure that as these hearings unfold, the government of the day is held accountable for the ultimate decision."

Kahgee reminded the crowd that water is life.

"You don't need scientists or billion dollar studies to tell you that, it's that simple. Without it we are lost," he said. "We are being told something, the water is speaking to us. The question is, are we listening?"

Kahgee said it is going to take a fundamental change from all of us because we like the convenience of turning on the tap.

"We must strive to be better and do more," he continued. "Many, many years ago, our people were faced with tremendous pressure for the influx of settlers in this area. They realized there was going to be change and they prepared for that change. They entered into those treaties with a simple understanding... that we would share this territory with those who came into it. But what was most fundamental to our people was that we would maintain a relationship with our land and our water."

Kahgee explained that his peo-

ple's language, their culture, their ceremonies and their very identity was related to that relationship.

"So when I see the struggles that we are enduring with our water right now... I can not help but think that it is a piece of us that is dying with it because of that relationship," he said. "It's that profound."

"We have to stand and be that difference. Complacency and ignorance is not acceptable."

The SFN chief said he was proud to see the efforts of SOS and would like to see more.

"We have to be the voice of the generation to come," he said. "(They'll ask) what efforts or steps did they take to protect what is most vital to each and every one of us?"

After the meeting, Barlow said Saugeen Shores residents need to put their foot down. They need to put their heads and hearts together to put a stop to the DGR process.

"[Nuclear waste] is the most toxic stuff on Earth and we have Great Lakes here that are in trouble," she said. "Invasive species, climate change, multi-point pollution, over-extraction... we are moving fossil fuels across them, the Great Lakes are already in serious decline."

Moreover, Barlow said a DGR will not only cause environmental harm, but economic harm as it "will destroy a community if

the water is contaminated."

As for the nuclear waste that is already situated at Bruce Power site, Barlow said it is just going to have to stay there.

"You talk to scientists who say we don't have the technology yet, and we may never, but the safest thing you can do... is to leave it where it is," she concluded. "We are going to have to rethink our energy policy, all of us collectively."

"Nobody is putting the blame on the nuclear industry, we all became addicted to these energy sources, but we know that they are hurting us and particularly water."

Looking to the future, Barlow said using energy sources such as solar is key in keeping our water harm free.

"If we lived in a world with unlimited water to which is what we grew up believing, it would be different, but we are really learning, and learning fast, that we are a planet running out of water."

"Anywhere where there is a water source like the Great Lakes, you need to do everything in your power to protect it, because once gone, there's no replacing it."

In addition to Saugeen Shores, Barlow's tour has taken her and her team to cities such as Toronto, London, Owen Sound, Kingston, Rochester, N.Y. and Grand Rapids, Mich..

- Environmental response
- Responsible governance
- Accountability
- Cultural shift

## Fukushima recovery in hands of government

BLOOMBERG

TOKYO—Japan's government will lead "emergency measures" to tackle radioactive water spills at the wrecked Fukushima nuclear plant, wresting control of the disaster recovery from the plant's heavily criticized operator, Tokyo Electric Power Co.

"We've allowed Tokyo Electric to deal with the contaminated water situation on its own and they've essentially turned it into a game of Whack-a-Mole," Trade Minister Toshimitsu Motegi told reporters Monday at Fukushima. "From now on, the government will move to the forefront."

Japan's Ministry of Economy, Trade and Industry "is working to draw up, by some time in September, both emergency measures and more fundamental steps to eliminate the roots of the contaminated water problem, as well as measures to be carried out going forward," the Prime Minister's office said in a response to written questions.

More than two years after the March 2011 nuclear disaster, Tokyo Electric's recovery effort has taken a turn for the worse. Last week, Japan's nuclear regulator questioned the company's ability to deal with the crisis, echoing comments earlier in the month by Japanese Prime Min-

ister Shinzo Abe.

Motegi's visit to the plant comes a week after a storage tank leaked 300 metric tons of highly radioactive water, which Japan's nuclear regulator labelled a "serious incident" in its worst assessment of the problems at Fukushima since the earthquake and tsunami of 2011 caused reactors to melt down.

It's now up to the government to lead management of the contaminated water building up in tanks at the plant at a rate of 400 tons a day, and leaking from underground tunnels into the ocean, Motegi said.

The trade minister ordered the utility known as Tepco to monitor its water storage tanks more frequently and replace the type that leaked, as well as "thoroughly" identify the risks of storing highly-contaminated water.

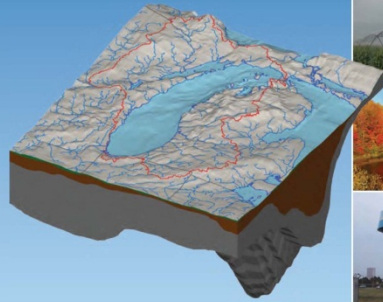
In its response to questions, the Prime Minister's office said the trade ministry, which oversees the world's biggest fleet of nuclear reactors outside the U.S. and France, will pump more "liquid glass" or sodium silicate into the ground as one measure to block the spread of contaminated water. In addition to the leaky tank, Tepco has admitted that irradiated water is flowing into the Pacific Ocean, which the government estimates at 300 tons a day.

- **Political and ecological interest**
- **Social and political networks**
- **Societal change in value**
- **Integrated thinking and adaptation**



National Water Availability and Use Pilot Program

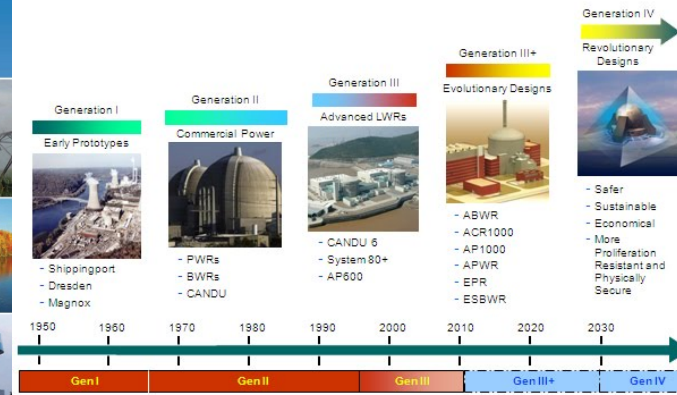
## Water Availability and Use Pilot: A Multiscale Assessment in the U.S. Great Lakes Basin



Professional Paper 1778

U.S. Department of the Interior  
U.S. Geological Survey

## Evolution of Nuclear Power



## Our Great Lakes Commons:

A People's Plan to Protect  
the Great Lakes Forever

By Maude Barlow  
National Chairperson,  
The Council of Canadians



- **Rapidly evolving understanding**
- **Technology engineering and scientific innovation commercially available by 2025**

### 3.2 Rapid change new approaches



- **Exploitation of Great Lakes**
- **Image of Niagara Falls 1900**

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### 3.3 Exploitation, fragility & recovery



- **2012 alga bloom on Lake Erie**
  - **Agricultural practices**
  - **Urbanization**
  - **Dependency and a balanced ecology**
-



- **The Great Lake basin**
  - **Single largest source of fresh water on earth**
  - **Ecology and human life**
  - **Risk factor**
-



- Is the DGR 1 EIS credible?
- Is this the right place to put a low and intermediate level radioactive storage facility?
- Is this the right place for the high level radioactive waste for all of Canada?

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**4 DECISION**

# **APPENDICIES**

**5.1 Fogler Rubinoff letter of opinion (reserved)**

**5.2 Speaking notes (reserved)**

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