

INTERGOVERNMENTAL RELATIONS COMMITTEE

14-0238R

RESOLUTION OPPOSING THE CONSTRUCTION OF A NUCLEAR WASTE
REPOSITORY IN THE GREAT LAKES BASIN.

BY COUNCILORS SIPRESS AND GARDNER:

WHEREAS, Ontario Power Generation is proposing to construct an underground long-term burial facility for all of Ontario's low and intermediate level radioactive nuclear waste at the Bruce Nuclear Generating Station which is located approximately one kilometer inland from Lake Huron and about 400 meters below the lake level; and

WHEREAS, the Great Lakes are vital to the economic and agricultural well-being of both the United States and Canada; and

WHEREAS, Lake Huron and connecting waters are a source of drinking water for millions of people downstream in both the United States and Canada; and

WHEREAS, the governments of both Canada and the United States share the responsibility and obligation to protect Great Lakes waters from contamination, including nuclear waste leakage; and

WHEREAS, both the Canadian and United States government recognized the importance of anticipating, preventing and responding to threats to Great Lakes waters under the *2012 Protocol Amending the Agreement Between Canada and the United States of America on Great Lakes Water Quality*; and

WHEREAS, the potential damage to the Great Lakes from any leak or breach of radioactivity at the proposed repository site far outweigh any suggested economic benefit.

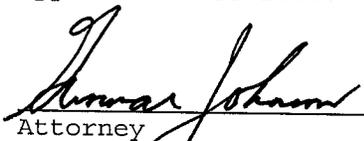
THEREFORE, BE IT RESOLVED, that the Duluth city council, in order to protect the Great Lakes, and its tributaries, hereby states its opposition to the proposed nuclear waste repository at the Bruce Nuclear Generating Station or any other proposition for the construction of a nuclear waste repository within the Great Lakes Basin.

FURTHER RESOLVED, that the city of Duluth hereby urges the governments of Ontario and Canada to reject and seek alternatives to the proposal by Ontario

Power Generation.

FURTHER RESOLVED, that copies of this resolution be provided to Ontario Premier Kathleen Wynne, Canada's Prime Minister Stephen Harper, Canada's Federal Minister of the Environment Leona Aglukkaq, Governor Mark Dayton, U.S. Senators Amy Klobuchar and Al Franken, U.S. Representative Rick Nolan, State Senators Roger Reinert and Tom Bakk, and State Representatives, Tom Huntley, Mary Murphy, and Erik Simonson, as well as Joint Review Panel Deep Geological Repository for Low and Intermediate Level Radioactive Waste Case Reference Number 17520, Panel Co-Manager, Ms. Debra Myles, all Members of Ontario's Provincial Parliament and all Members of Canada's Parliament.

Approved as to form:



Attorney

CCREQ/ATTY JS:GBJ:cjh 4/29/2014

STATEMENT OF PURPOSE: This resolution is a statement of opposition to a proposal by Ontario Power Generation to construct a nuclear waste burial facility near the shore of Lake Huron.

To: Duluth City Council
From: Joel Sipress, Chair of Intergovernmental Relations Committee
Date: May 6, 2014
Re: Resolution on Proposed Nuclear Waste Facility on Great Lakes

Please find attached documentation in support of 14-0238R on Ontario Power Generation's (OPG) proposed nuclear waste facility near the shores of Lake Huron. The documentation includes:

- A list of communities in the United States and Canada that have passed resolutions in opposition to the OPG proposal. The list includes Duluth's sister city of Thunder Bay (Ontario, Canada), as well as such cities as Toledo (Ohio), Erie (Pennsylvania), Rochester (NY), Sheboygan (Wisconsin), and Toronto (Ontario, Canada).
- Written testimony in opposition to the project from Milwaukee mayor Tom Barrett to the Canadian regulatory body on behalf of the Great Lakes and St. Lawrence Cities Initiative (GLSLCI), an organization of which the City of Duluth is a member.
- Submission to the regulatory body by Dr. Peter Duinker, an independent expert in environmental assessments engaged by the body to review OPG's environmental impact statement. Dr. Duinker found the OPG's materials to be "not credible."
- Written testimony in opposition to the project from Michigan State Senator Hoon-Yung Hopgood to the regulatory body. Senator Hopgood's submission includes letters of opposition from number of organizations in Michigan, including organizations representing maritime interests in the state.

Communities in Opposition to OPG Plan

United States

Michigan

City of Milan	February 10, 2014
City of Eastpointe, Macomb County	January 7, 2014
Charter Township of Clinton, Macomb County	December 3, 2013
City of Wayne	November 19, 2013
City of Gross Pointe Woods	November 18, 2013
Conference of Western Wayne	November 15, 2013
City of Wyandotte, Wayne County	September 23, 2013
Greenwood Township, St. Clair County	September 10, 2013
Wayne County Commission	August 22, 2013
St. Clair County Board of Commissioners	August 15, 2013
Village of Lexington	July 22, 2013
Lynn Township	July 13, 2013
Macomb County Board of Commissioners	June 20, 2013
Michigan State Senate	May 22, 2013
City of St. Clair Shores, Macomb County	July 7, 2008
St. Clair County Water Quality Board	June 12, 2008
Marine City, St. Clair County	June 5, 2008
Macomb County Board of Commissioners	May 15, 2008
Macomb County Water Quality Board	May 13, 2008

Ohio

Port Clinton	December 10, 2013
City of Toledo	October 1, 2013
City of Oregon	August 12, 2013

Illinois

City of Waukegan	February 3, 2014
------------------	------------------

New York

City of Rochester

November 19, 2013

Pennsylvania

City of Erie

April 2, 2014

Wisconsin

City of Sheboygan

April 2, 2014

Indiana

Michigan City

April 15, 2014

Canada

Ontario

City of Brampton

April 9, 2014

Municipality of McDougall

April 2, 2014

City of Port Colborne

March 10, 2014

City of Niagara Falls, ON

March 3, 2014

McKellar Township

March 3, 2014

Municipality of Whitestone

February 27, 2014

Town of Parry Sound

February 18, 2014

Town of Grimsby

February 3, 2014

City of Thunder Bay

January 27, 2014

City of Sault Ste. Marie

January 20, 2014

City of St. Catharines

January 13, 2014

Municipality of Chatham Kent

January 13, 2014

Town of Ajax

November 25, 2013

City of Kingston

November 19, 2013

City of Windsor

November 18, 2013

City of Toronto

November 14, 2013

Town of Oakville	October 28, 2013
City of Mississauga	October 9, 2013
City of London	October 2, 2013
Town of Blue Mountains	September 16, 2013
City of Hamilton	September 11, 2013
City of Sarnia	September 9, 2013
Lambton County	September 4, 2013
Town of Kingsville	July 22, 2013
Essex County	July 17, 2013

PMD 13-P1.28

File / dossier : 8.01.07
Date: 2013-07-24
Edocs: 4179064

Oral Statement from

**Great Lakes and St. Lawrence
Cities Initiative**

In the Matter of

Ontario Power Generation Inc.

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

Présentation orale par

**Alliance des villes des Grands Lacs et
du Saint-Laurent**

À l'égard de

Ontario Power Generation Inc.

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

16 septembre au 12 octobre 2013



May 24, 2013

Joint Review Panel
Deep Geologic Repository for Low and
Intermediate Level Radioactive Waste
Case Reference Number 17520
Debra Myles, Panel Co-Manager
c/o Canadian Environmental Assessment Agency
160 Elgin Street, 22nd Floor
Ottawa ON K1A 0H3
Canada

Dear Joint Review Panel:

The Great Lakes and St. Lawrence Cities Initiative (Cities Initiative) is an organization of mayors and other local elected leaders from over 100 cities in Canada and the United States working together to advance the protection, restoration, and long term sustainability of the world's largest source of surface fresh water, the Great Lakes and St. Lawrence. The economic well-being and quality of life for the 16 million citizens of these communities as well as for all Canadians and Americans is a key goal. By making its own cities more sustainable and addressing issues that have implications for the resource, the organization seeks to lead by example and encourage others to do the same. It is for this reason that the Cities Initiative provides these comments on the deep geologic repository (DGR) proposed by Ontario Power Generation (OPG) for the long term storage of low and intermediate level radioactive waste at the Bruce Power nuclear generating station site in Kincardine, Ontario.

The Cities Initiative appreciates the cooperativeness of OPG in arranging a fact finding site visit to the proposed facility for several members of the organization. All of the right people from OPG and others from the National Waste Management Organization were there and all questions were answered in a very forthright manner. In addition, written material was provided in advance and during the tour to further inform the participants. The Cities Initiative learned a great deal more about the project and is in a better position to provide comments.

Timing for Comments

The Cities Initiative is concerned that the public comment period on the Environmental Impact Statement (EIS) for the proposed DGR is being closed on May 24 after only 30 days' notice. We recognize that the comment period has been open for a much longer time, but with the magnitude and complexity of materials accumulated in the record of this proceeding, more

20 North Wacker Drive, Suite 2700, Chicago, Illinois 60606 ~ (312) 201-4516 phone ~ (312) 407-0038 fax
www.gslscities.org

Tom Barrett, Mayor of Milwaukee, Chair

Keith Hobbs, Mayor of Thunder Bay, Vice-Chair

Régis Labeaume, President of Québec Metropolitan Community, Secretary/Treasurer



Great Lakes and St. Lawrence Cities Initiative
Alliance des villes des Grands Lacs et du Saint-Laurent

advance notice of the end of the comment period should have been given. The Cities Initiative is a small organization with limited resources with a large membership spread from the western end of Lake Superior to the Gulf of St. Lawrence. It is very difficult to review the materials and communicate with the membership in the time provided. We fully intend to participate as interveners in the public hearing, but request an additional 60 days for providing comments on the EIS.

Community and Stakeholder Outreach

The Great Lakes and St. Lawrence region is a unique community bound together by the fresh water treasure of the world. This region is thinking and acting more like an integrated social, environmental, and economic cohesive unit all the time. The history of this goes back many years, starting with the Boundary Waters Treaty of 1909, and has been reinforced more recently by the Great Lakes Water Quality Agreement of 1972 (amended in 2012), and the Great Lakes and St. Lawrence Water Resources Management Agreement and Compact of 2008. Many organizations like the Great Lakes Fishery Commission, the Great Lakes Commission, the Council of Great Lakes Governors, the Council of Great Lakes Industries, and the Cities Initiative have extensive Canadian and U.S. involvement and reinforce the idea of thinking and acting like an integrated region.

This point is important because the DGR is something that has significant implications for the entire region. OPG has obviously done extensive outreach in the Kincardine and Bruce County area, and has reached out to elected officials and others in Michigan, but the area of interest is really much larger. Because of the large supply of surface fresh water, the Great Lakes and St. Lawrence region has attracted a great deal of electrical generating capacity over the years. This includes traditional coal fired plants, as well as nuclear generating stations and hydropower dams. Now wind farms are seen in many places around the region, as well. This generating capacity has been a real advantage to the area, but some costs have come with it. One of the significant concerns for some time has been what to do with all the low, intermediate, and high level radioactive waste that has accumulated over the years. OPG is to be commended for stepping forward to find a more permanent solution to managing the waste in the long term. At the same time, recognizing the regional nature of the issue, there has not been enough outreach to the broader Great Lakes and St. Lawrence region on the DGR project and that needs to be done before the EIS and licensing process moves forward.

Site Selection

From the record and what we have learned by visiting the proposed site of the DGR, it is our understanding that the municipality of Kincardine originally approached OPG about being a

20 North Wacker Drive, Suite 2700, Chicago, Illinois 60606 ~ (312) 201-4516 phone ~ (312) 407-0038 fax
www.gslscities.org

Tom Barrett, Mayor of Milwaukee, Chair

Keith Hobbs, Mayor of Thunder Bay, Vice-Chair

Régis Labeaume, President of Québec Metropolitan Community, Secretary/Treasurer



Great Lakes and St. Lawrence Cities Initiative
Alliance des villes des Grands Lacs et du Saint-Laurent

host for the radioactive waste and the DGR. It is fully understandable why the municipality would be receptive given the long term relationship with the company and the nuclear plant, and recognizing the economic significance of the plant and the DGR to the community and all of Bruce County. Obviously, community acceptance of the project is exceedingly important. It is our understanding that no other site was considered. Recognizing the significance of the issue and the size of Ontario, it does not seem appropriate to limit potential sites to just one location and potential solutions just to DGR. As good as the geology for the site and the engineering for the DGR might be, it is hard to believe that there might not be more appropriate sites elsewhere.

Perhaps of greatest concern is the close proximity of the site one kilometer from the shore of Lake Huron, or to any of the Great Lakes or St. Lawrence. When dealing with a resource as valuable as the fresh water here, why take the risk of putting the site so close to the shore. Whatever the geology might be in the location, it just seems to make much more sense to have the site as far away as possible from such a major source of fresh water.

Conclusion

The Cities Initiative greatly appreciates the efforts OPG has put forth to help inform representatives of the organization on the DGR project, and recognizes all the work that has gone into the proposal. However, the limited time to review the record and prepare comments, the limited outreach to the broader Great Lakes and St. Lawrence community, and the consideration of only one site that is one kilometer from Lake Huron leads us to conclude that the project should not move forward at this time.

Sincerely,



Tom Barrett, Chair
Great Lakes and St. Lawrence Cities Initiative
Mayor of Milwaukee

PMD 13-P1.175

File / dossier : 8.01.07
Date: 2013-08-30
Edocs: 4192861

Written Submission from

Peter Duinker

In the Matter of

Ontario Power Generation Inc.

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

Mémoire de

Peter Duinker

À l'égard de

Ontario Power Generation Inc.

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

Date: 2013 08 30

To: Environmental Assessment Panel for the Deep Geologic Repository Project

From: Peter Duinker, Contractor to the Panel

Subject: Review of OPG's Application of (a) Environmental Assessment (EA) Methodology with Emphasis on the Prediction of the Significance of Adverse Environmental Effects, and (b) Cumulative Effects Assessment

A. Prediction of the Significance of Adverse Environmental Effects

1. Documents Consulted, as per Instructions from the JRP

Reference Guide: Determining Whether A Project is Likely to Cause Significant Adverse Environmental Effects, 1994 (Reference Guide)

DGR Environmental Impact Statement Guidelines, 2009 (Guidelines)

OPG's Deep Geologic Repository Project for Low & Intermediate Level Waste: Environmental Impact Statement, 2011 (EIS)

Consolidated Responses to JRP's Information Requests for Deep Geologic Repository Project for Low and Intermediate Level Waste (Consolidated Responses)

2. Guidance for the Review

The following criteria were set by the JRP for the review:

- Credibility: Trustworthiness and expertise as well as how closely the work in question adheres to scientific principles.
- Defensibility: Sound, reasonable, well-founded methods that are consistent with CEAA requirements and guidance.
- Clarity: Understandable and unambiguous presentation of the context, methods, results and conclusions.
- Completeness: All relevant aspects are analysed.
- Reliability: Results would be the same or compatible using different methods or approaches; i.e. the results of the analysis are reproducible.
- Appropriateness: Suitable, correct, and relevant methods (as per CEAA requirements and guidance) and conclusions.

Additionally, I have understood that my review is to be made in the context of advice and guidance available to the Proponent from the Canadian Environmental Assessment Agency and the JRP. I will make reference to concepts beyond that guidance only when I find that the guidance is silent on an important matter pertaining to sound EA principles and practice.

3. Summary of the JRP Guidance to the Proponent

In section 11 of the Guidelines, the JRP instructs the Proponent about effects prediction, mitigation measures, and determination of the significance of residual adverse effects. The JRP gives detailed instructions about tiers in the practice of ecological risk assessment and demands an account of levels and types of uncertainties pertaining to effects predictions. Following instructions about mitigation, the JRP then instructs the Proponent to assess the significance of all residual adverse effects. The JRP instructs the Proponent to use the following six concepts (criteria) in judging effect significance:

- magnitude of effect
- spatial extent of effect
- timing, duration, and frequency of effect
- reversibility of effect
- ecological and socio-cultural context of the effect
- probability of occurrence of effect

The Proponent is instructed to make reference to government standards, regulations, guidelines, and objectives in considering significance of effects. The Proponent is further instructed to apply a transparent process of determining an effect's performance against each of the six criteria and combining the results into an overall determination of significance.

My interpretation of the above guidance is that it is a departure from the guidance given in the Reference Guide. In the latter document, the framework laid out suggests the following order of steps:

- first, determine whether the predicted effects are adverse
- second, determine whether any adverse effects are significant
- third, determine whether any significant adverse effects are likely

The implication of the first step is that impacts considered not adverse (i.e., not undesirable) do not need to be carried forward for further consideration. The second step is elaborated in the Reference Guide with the following criteria for judging significance:

- magnitude of effect
- spatial extent of effect
- duration and frequency of effect
- reversibility of effect
- ecological context

It is only at step 3 where likelihood of effect is taken into account, i.e., AFTER the determination of significance. Thus, in the Guidelines, likelihood is a criterion for judging significance, whereas in the Reference Guide, it is not.

4. Summary of OPG's Work on Determining Significance of Effects

I begin my examination of approach and method with Figure 1.6.7-1 on page 1-23 of the EIS. In my interpretation, the assessment process went like this:

- describe the project
- characterize the existing environment (in terms of VECs mainly)
- screen for project-VEC interactions; if there are interactions, then
- screen for measurable change; if such a change is likely, then
- predict and assess effects on VECs (as compared to evaluation criteria); if adverse effects are anticipated, then
- design mitigation, then
- re-predict and re-assess effects on VECs; if there are residual adverse effects, then
- feed these predictions into the cumulative effects assessment, and then
- determine the significance of residual adverse cumulative effects, and finally
- design follow-up (monitoring) protocols

Then in Section 7 of the EIS, the Proponent presents effects predictions, design of mitigation measures, and determinations of significance of residual effects. Effects are presented for VECs grouped into ten broad environmental components as well as integrated into what were called four "ecological multi-feature VECs". The Proponent explains how the assessment process worked; from page 7-2 of the EIS:

"Screen to Focus the Assessment. Two screening steps, first for potential interactions and secondly for likely measurable change, allow the assessment to focus on where effects are likely to occur. These steps are completed using professional judgement; if there is uncertainty, the interaction is advanced for assessment.

"Assess Effects. Where there is likely to be a measurable change, the effects on the environment are predicted and assessed as to whether or not they are adverse*. If adverse effects are predicted, mitigation measures to reduce or eliminate the effect are proposed. Once mitigation measures are proposed, the likely adverse effect is reevaluated with the mitigation measures in place to identify whether any residual adverse effects remain. Residual adverse effects are then advanced for a determination of significance.

[*Interestingly, on page p. 281 of the Consolidated Responses, in respect of the terrestrial environment and application of the precautionary approach, OPG states that "Any measurable change (i.e., a change that is real, observable, or detectable compared to existing conditions) is considered an adverse effect".

"Determine Significance. All residual adverse effects are then assessed to determine whether the effect is significant, or not, taking into account the magnitude, geographic extent, duration, frequency, irreversibility and social/ecological context of the effect."

This last step is directed by the contents of Table 7.1-1, which contains qualitative statements to

help assign a low, medium, or high status to each predicted adverse effect against the criteria of magnitude, spatial extent, timing/duration, frequency, and irreversibility (actually, the rating of magnitude is settled with statements unique to each VEC, as presented later in Chapter 7). It is noteworthy that context and likelihood of effect are not covered in the Table.

It is necessary to delve deeper into Chapter 7 of the EIS to understand the actual assignment of significance to residual adverse effects. Taking information as a guide from pages 7-68 to 7-70, it seems that the magnitude question is settled for each VEC separately - here for eastern white cedar. Then, assessors determined into which category of Low, Medium, or High the VEC would find itself, for each criterion, based on the anticipated residual adverse effect. Then, findings for magnitude, extent, timing/duration, frequency and irreversibility were combined to identify a degree of environmental consequence, undefined but also subject to classification into Low, Medium, and High categories. Finally, the VEC was subjected to an assessment of social/ecological importance which was combined with the finding of environmental consequence to arrive at a finding about significance.

To illustrate the chain of assessment tasks in application, I use the VEC called eastern white cedar (I am using this plant species because it is the only one to be brought forward to the cumulative effects assessment):

- during site preparation, 8.9 ha of mixed-species forest cover needs to be removed; eastern white cedar is a major constituent of this woodland
- this amount of woodland removal represents 77% of the woodland in the Project Area, and 11% of the woodland in the Site Study Area
- cedar is deemed an important tree species in the region, with high levels of local and regional abundance
- the effect is considered adverse and there is no practicable mitigation of the woodland removal (i.e., it must be done for project implementation); therefore, the loss of 8.9 ha of woodland containing cedar is considered a residual adverse effect
- in terms of criteria for judging significance, the effect is classified as follows:
 - magnitude = medium (loss of greater than 25% of woodland in the Project Area)
 - extent = low (effect is limited to the Site Study Area)
 - timing/duration = low (effect occurs only during site preparation and construction)
 - frequency = high (the effect persists continuously)
 - degree of irreversibility = medium (can be reversed with time)
- given those levels of performance of the effect against the criteria, the environmental consequence (without consideration of frequency) is judged to be low
- given that environmental consequence is judged to be low, social/ecological importance is not assessed, and the effect is judged in the end to be NOT SIGNIFICANT (as per Table 7.4.3-2).

Without making a detailed examination of the rest of Chapter 7 of the EIS, I assume that all other interactions between the project and the VECs have been put through the same sequence of considerations.

5. Findings

5.1 The Approach Diagram

My examination of Figure 1.6.7-1 raises some questions:

- What is meant by "measurable" change? Measurability of a change depends on some key factors such as available technology and level of effort. Because level of effort in empirical data collection can vary dramatically depending on budget allocation, one would assume that the assessment of measurability would need to account explicitly for a specific level of effort in monitoring. I suspect that this was not done, for if it had been, details of reasonable levels of effort in monitoring would have been presented.

- If the step labelled "Screen for Measurable Change" answers the question "Is a measurable change likely", then one wonders what additional work is to be accomplished in the next step, called "Predict and Assess Likely Effects on VECs", where the question is "Is there an adverse effect"? When I combine this with the statement from page 281 of the Consolidated Responses, in respect of the terrestrial environment and application of the precautionary approach, where OPG states that "Any measurable change (i.e., a change that is real, observable, or detectable compared to existing conditions) is considered an adverse effect", I am further suspect about the robustness of the Proponent's approach to effects assessment.

5.2 Arbitrariness in Professional Judgement

I have examined quite a few EISs in my career, and I have never seen a more complicated approach to the determination of significance of residual adverse effects. As soon as one engages in assignment of ordinal categories to various attributes of a predicted effect, one enters the shifting sands of arbitrariness in professional judgements about limits and combinations. Let us examine each in turn.

5.2.1 Limits

To facilitate my discussion, I again turn to cedar. Let us examine the limits associated with magnitude category assignment as depicted in Table 7.4.3-1. Here we have the following definitions:

- Low Magnitude - Loss of some trees at several locations leading to reduction in conifer woodlands by 5 to 10% or mixed woodlands by 10 to 25% in the Project Area compared with baseline
- Medium Magnitude - Loss of many trees at numerous locations associated with largescale clearing of vegetation in the Project Area; reduction in conifer woodlands by >10% or mixed woodlands by >25% in the Project Area compared with baseline
- High Magnitude - Local population decrease of >25% in conifer woodlands or >40% of mixed

woodlands attributed to loss of forest communities throughout the Site Study Area

On what grounds has 5% been set as a lower limit for assignment of Low Magnitude? If Medium Magnitude is assigned limits of 11% on the low side and 25% on the high side, what is it about conifer woodlands that would see a Low Magnitude for a 10% reduction, and a Medium Magnitude for anything from 11% to 25%? Are 10% and 11% not closer to each other than 11% and 25%? There is absolutely no ecological justification for the assignment of these limits, or indeed any such limits. If there were ecological justifications, such as conservation of gene pools of cedar or habitat provisions for important vertebrate species, then surely these would have been provided.

A counter-argument could be made that if one is obliged to use categories of Low, Medium, and High for Effect Magnitude (or any of the other criteria for judging effect significance, as depicted in Table 7.1-1), then one needs category-defining limits to be able to make the assignment. The EIS Guidelines do not oblige the Proponent to use such categories - as per section 11.3. Rather, they oblige the Proponent to ensure that the EIS "clearly explain the methods and definitions used to describe the level of the adverse effect (e.g., low, medium, high) for each of the above categories . . .". The words "low, medium, high" are given as an example of approach. In my opinion, it would be hugely better to avoid such categories and rely on an approach based on context-based reasoning to assess the conditions of effect magnitude, extent, timing, duration, frequency, and reversibility using the characteristics of the basic effect prediction (i.e., in this case, that 8.9 ha of cedar-containing woodland would be removed and not allowed to re-establish for the life of the project).

5.2.2 Combinations

Thirteen terrestrial VECs are accounted for in section 7 of the EIS. All are predicted to incur measurable changes, but only one is assessed to suffer a residual adverse effect - cedar. A massive and elaborate decision tree is advanced in Figure 7.4.3-1 to show how one might arrive at a conclusion on effect significance. The point of the tree, which includes 19 unique pathways through the maze of considerations of magnitude, extent, irreversibility, timing and duration (curiously, frequency is missing), consequence, and social/ecological importance, is unclear when only one VEC is to be subjected to it. Cedar passes through the maze with magnitude = medium, extent = all, irreversibility = medium/high, timing and duration = low, consequence = low, and finally significance = not significant.

I do not challenge an EIS finding that the residual adverse effect on cedar is not significant. What I challenge is the rationale for making that finding. On what grounds does one judge that consequence is low on the basis that magnitude = medium, extent = all, irreversibility = medium/high, and timing and duration = low? To choose one of the other 18 pathways through the maze, on what grounds would one arrive at a conclusion of "may not be significant" (a term itself not defined) when the assessment says that magnitude = high, extent = medium, irreversibility = high, consequence = high, and social/ecological importance = low? Moreover, I had understood from the Consolidated Responses document (page 471) that all VECs were important - otherwise they would not be VECs and therefore not included in the assessment.

To me, the decision trees represent an unjustified, arbitrary set of pathways to conclusions about effect significance. They are unnecessary for someone to develop a reasoned set of arguments, grounded in an effect prediction and contextual analysis, leading to a conclusion about effect significance.

5.3 The Notion of "May Not Be Significant"

Each decision tree for effects assessment on biophysical VECs includes the possibility of a finding of "may not be significant" (the other two categories being "not significant" and "significant"). The EIS suggests that "an effect that 'may not be significant' is one that in the professional judgement of the specialists would not be significant; however, follow-up monitoring should be proposed (or rather 'implemented' in some instances) to confirm significant adverse effects do not occur".

This is my first encounter with the concept of "may not be significant". The explanation above leaves much to question. If an effect were to be assessed as "may not be significant", it means not significant but monitoring is required. In other words, the confidence of the assessors is lower in making this call than when declaring an effect as "not significant" or "significant". It suggests that monitoring is only required when a finding of "may not be significant" is made. As it turns out, no residual adverse effects were deemed to be either "significant" or "may not be significant", with the obvious conclusion that nothing needs to be monitored.

No guidance material I have examined suggests that a finding of "may not be significant" is a legitimate outcome. Guidance material suggests that effects are either "significant" or "not significant". As it turns out, no findings of "may not be significant" were presented in the EIS. Yet 33 of the total of 93 pathways through the five decision trees lead to "may not be significant". This makes the decision trees highly misleading.

6. Conclusions

The EA I examined from the perspective of determination of significance of residual adverse effects has significant flaws of approach and method. Against the criteria I was instructed to use, I find that the analysis embodied in the EIS and Consolidated Responses is:

- not credible - the work does not adhere to what I consider to be a robust approach to determination of significance of residual adverse effects;
- not defensible - the methods include huge elements of arbitrary and indefensible professional judgements;
- unclear - the scientific basis for many professional judgements in setting category limits and decision-tree combinations was not described;
- not reliable - other expert assessors could easily come to different conclusions;

- inappropriate - the methods, as shown above, are unnecessarily complicated and prone to challenge regarding limits and combinations.

B. Cumulative Effects Assessment

1. Documents Consulted, as per Instructions from the JRP

Cumulative Effects Assessment Practitioners' Guide, 1999 (Practitioners' Guide)

Operational Policy Statement: Addressing Cumulative Effects Assessment under the Canadian Environmental Assessment Act, 2007 (OPS)

DGR Environmental Impact Statement Guidelines, 2009 (Guidelines)

OPG's Deep Geologic Repository Project for Low & Intermediate Level Waste: Environmental Impact Statement, 2011 (EIS)

Consolidated Responses to JRP's Information Requests for Deep Geologic Repository Project for Low and Intermediate Level Waste (Consolidated Responses)

2. Guidance for the Review

The following criteria were set by the JRP for the review:

- **Credibility:** Trustworthiness and expertise as well as how closely the work in question adheres to scientific principles.
- **Defensibility:** Sound, reasonable, well-founded methods that are consistent with CEAA requirements and guidance.
- **Clarity:** Understandable and unambiguous presentation of the context, methods, results and conclusions.
- **Completeness:** All relevant aspects are analysed.
- **Reliability:** Results would be the same or compatible using different methods or approaches; i.e. the results of the analysis are reproducible.
- **Appropriateness:** Suitable, correct, and relevant methods (as per CEAA requirements and guidance) and conclusions.

Additionally, I have understood that my review is to be made in the context of advice and guidance available to the Proponent from the Canadian Environmental Assessment Agency and the JRP. I will make reference to concepts beyond that guidance only when I find that the guidance is silent on an important matter pertaining to sound CEA principles and practice.

3. Summary of the JRP Guidance to the Proponent

Section 14 of the EIS Guidelines lay out the JRP's expectations for cumulative effects assessment (CEA). The JRP identifies the OPS as a guidance document. It requires an account of the

approach and methods the Proponent would use to identify and assess cumulative effects (CEs). It requires a rationale for all valued ecosystem components (VECs) selected for the CEA, along with the unique temporal and spatial boundaries for each VEC. It requires identification of the sources of potential CEs, and requires that the Proponent examine induced developments. It requires an analysis of the total CE on a VEC over the life of the project, including all forms of CEs (as in synergistic, additive, induced, spatial, temporal). It requires identification of impact pathways and trends, as well as the contribution of the project to the total potential cumulative effect on VECs. Potential CEs are to be put into an appropriate regional context.

4. Summary of OPG's Work on Cumulative Effects

In line with contemporary practice, the EIS presents CEs in a separate chapter (Chapter 10). The CEA is described as "considering all of the incremental effects of the DGR Project that were assessed to have a likely residual adverse effect or beneficial effect on a VEC". The Proponent chose to "focus the assessment of cumulative effects on those projects whose effects overlap in type of effect, time and space with those residual adverse effects of the DGR Project". Furthermore, "the cumulative effects assessment is conducted at a more general level of detail than in previous sections of the EIS since the projects are more remove in time and space". The Proponent states that "consistent with EA practice, the cumulative effects assessment applies to activities during normal operations only".

Critical to the approach and methods of the Proponent in undertaking the CEA is the decision tree depicted in the EIS's Figure 10.2-1. It demands that CEs of the project fulfill all the following criteria, assessed in the following order for any specific VEC:

- (a) the DGR Project must be predicted to have a residual adverse effect;
- (b) any other project or activity considered must have the same type of effect on the VEC as that predicted for the DGR;
- (c) any other project or activity considered must have an effect on the VEC at the same time as that predicted for the DGR; and
- (d) any other project or activity considered must have an effect on the VEC in the same place as that predicted for the DGR.

If any of these criteria remains unfulfilled, the conclusion will be that the DGR does not have a CE on a VEC in association with the other project or activity under consideration.

The Proponent chose to ignore possible CEs associated with malfunctions and accidents because they "are considered too 'rare' to be assessed together with those caused by normal operational activities". The Proponent presents 15 VECs for inclusion in the CEA in Table 10.3-1. The Proponent presents descriptions of 19 past and existing projects, six certain/planned projects, and six reasonably foreseeable projects. After considering project-effect overlaps in type, time, and space, the Proponent assessed CEs. The Proponent concludes that "no residual adverse

cumulative effects of the DGR Project" could be identified. Further, "therefore, the assessment of the significance of residual adverse cumulative effects is not required".

5. Findings

1. It is vital in this analysis to consider deeply what conditions must pertain before one can suspect the occurrence of CEs. According to the Practitioners' Guide, "Cumulative effects may occur if: local effects on VECs occur as a result of the action under review; and those VECs are affected by other actions". The Proponent has taken a much more constrained view of CEs. To summarize the OPG stance on CEs, they ONLY occur when the effects of the DGR overlap with the effects of other actions in terms of type of effect, timing, and location. All three of these need to be satisfied before the Proponent considers CEs to be worthy of consideration.

To my knowledge, there is nothing in the guidance materials that would support the stringent criteria the Proponent has put on the circumstances for considering CEs (notwithstanding the OPG claim on page 1162 of the Consolidated Responses document that "the method used [to assess cumulative effects of the DGR Project] is consistent with the guidance provided" in the Practitioners' Guide). Many items of literature that would have been drawn upon by the writers of the Practitioners' Guide have spoken to the temporal and spatial overlaps of the effects of multiple projects, but, as far as I know, none of such literature demands that both be satisfied before CEs occur. Most serious here, though, is the insistence that the type of effect must be the same before CEs occur. Consider this example - if one were assessing the effects of a project's cooling-water effluent on a fish population in a lake, would it not be reasonable to assess the cumulative effects of the effluent-producing project along with sewage-related pollutants from subdivision development on the lake's shores as well as the pressures on the fish population from fishing? These are three substantially different pathways of effects on the VEC (fish population), each emanating from a different human action, and surely demanding attention in terms of VECs. The words in the Practitioners' Guide - "those VECs are affected by other actions" - are silent about type of effect.

As I have written in the literature (e.g. Duinker 1994; Duinker and Greig 2006), CEA is an exercise to be focussed on the sustainability of VECs. In whatever way a VEC is defined, its sustainability is at issue in EA and CEA, and ALL human actions that may collectively compromise that sustainability need to be included in a CEA. In my opinion, the actions and their pathways of influence on the VEC do NOT need to overlap in time (e.g., body burdens of bioaccumulated toxins in long-lived organisms could be delivered decades apart and exhibit CE behaviour), nor space (e.g., migratory organisms could be subject to one habitat-related stress in one location and another habitat-related stress hundreds of kilometres away), nor type (e.g., the fishing example above). OPG has unduly restricted its attention on CEs by insisting that only those where temporal, spatial, AND type overlaps are involved merit assessment.

2. I am puzzled by the logic applied by the Proponent in certain cases where the DGR Project is assessed as leading to a residual adverse effect on a VEC (a statement which is silent about significance), and yet the assessment of CE finds no residual adverse cumulative effect. Consider the case of eastern white cedar. It is represented in the EIS Table 10.5.4-1 under the

"Terrestrial Environment" column, and fetches three stars (meaning overlap in type, time, and location) in the 29th row. In Section 10.6.2, the Proponent admitted that the DGR Project will cause a residual adverse effect on cedar resulting from site clearing for the Project. The project known as "Centre of Site Additions and Modifications" is expected to require additional land clearing, thus implicating additional cedar to be cut. The Proponent then declares that such additional habitat loss will be small, and therefore unlikely to lead to residual adverse cumulative effects on cedar. This conclusion would necessitate a different set of criteria to judge whether a residual effect is expected from the Project alone, vs. a residual cumulative effect from the Project in combination with other projects. I would have thought that no matter how small an additional amount of cedar habitat needs to be eliminated from other actions, if the main Project has a residual adverse effect and other projects would create more of such an effect, surely that would lead to a finding of residual adverse cumulative effect.

3. On page 1156 of the Consolidated Responses document, OPG defines indirect effects as "those where changes to another VEC as a result of the project could have a synergistic effect on the VEC in question". This interpretation of indirect effect is probably not widely shared among EA practitioners. If a human action kills American marten (e.g., trapping), that would be a direct effect of the action. If the action removes forest habitat for American marten, that would be an indirect effect on the marten. If an action killed red-backed voles on which American marten preferentially feed, that would be an indirect effect on the marten. None of this has necessarily to do with synergy, which should be interpreted to mean that the combined effects of two stressors is more than the sum of the effects of each stressor acting alone. OPG provided the example of changes in groundwater quality on cedar trees as an indirect (and therefore synergistic) effect on cedar. If the Project requires removal of cedar trees in some areas, and changes in groundwater quality will potentially affect cedar trees in other areas, how is this synergistic?

4. On page 1157 of the Consolidated Responses document, OPG states that "In selecting the valued ecosystem components (VECs), consideration was given to identifying species that are indicative of the ecosystem as a whole". I see no coverage of the indicator role of species in the EIS' discussion on VEC selection (section 5.3). This topic is subject to wide-ranging coverage in the scientific literature, and could have been addressed.

5. On page 1704 of the Consolidated Responses document, OPG states that "based on this conclusion [of no likely adverse cumulative effects] and the approach used in the assessment, the indicators used for the assessment of effects on VECs are considered adequate for monitoring all effects of the project, including cumulative effects". The information request that prompted this response spoke to the possibility that indicators of CE may be different from the ones most appropriate for project effects on VECs. Even if this possibility exists, it is illogical to argue that a finding of no likely adverse cumulative effect justifies the selection of indicators for monitoring based solely on the project's effects on VECs. The point of monitoring is to reveal whether effect predictions are (a) correct, and (b) based on solid evidence and reasoning. As soon as other human actions are brought into consideration because of a CEA requirement, there may be additional variables under consideration in the pathways of effect. The conclusion of no likely adverse cumulative effects requires confirmation through monitoring, so there is plenty of reason to consider variables that are not part of the cause-effect pathways associated with the central

project under assessment.

6. Conclusions

The CEA I examined has large flaws of approach and method. Against the criteria I was instructed to use, I find that the analysis embodied in the EIS and Consolidated Responses is:

- not credible - the work does not adhere to what I perceive to be the scientific principles of CEA;
- not defensible - the methods are not consistent with CEAA requirements and guidance;
- clear enough - I believe I could understand OPG's approach from the descriptions provided;
- reasonably complete;
- not reliable - other expert assessors could easily come to different conclusions;
- inappropriate - the methods, as shown above, are in substantive aspects incorrect.

I caution that despite my findings that the CEA is flawed, I do not draw any inference that a properly conducted CEA would result in findings of significant residual adverse cumulative effects. It is entirely possible that a competent CEA would conclude just as the Proponent has concluded, that the CEs of the DGR Project are, on balance, insignificant. However, that outcome can only be known by actually undertaking a competent CEA. In my opinion, such a competent CEA would require a grounding in scientific principles and approaches to assessment practice that go far beyond the guidance provided by the Canadian Environmental Assessment Agency and the JRP.

7. References

Duinker, P.N. 1994. Cumulative effects assessment: what's the big deal? In: Cumulative Effects Assessment in Canada: From Concept to Practice (A.J. Kennedy, editor), pp. 11-24. Alberta Society of Professional Biologists, Calgary, AB.

Duinker, P.N. and L.A. Greig. 2006. The impotence of cumulative effects assessment in Canada: ailments, and ideas for redeployment. *Environmental Management* 37(2):153-161.



HOON-YUNG HOPGOOD
ASSISTANT DEMOCRATIC FLOOR LEADER
8TH DISTRICT
P.O. BOX 30036
LANSING, MI 48909-7536
PHONE: (517) 373-7800
FAX: (517) 373-9310
senhopgood@senate.michigan.gov

THE SENATE
STATE OF MICHIGAN

APPROPRIATIONS SUBCOMMITTEES:
AGRICULTURE, MVC
ENVIRONMENTAL QUALITY, MVC
K-12, SCHOOL AID &
EDUCATION, MVC
NATURAL RESOURCES, MVC

EDUCATION COMMITTEE, MVC
ENERGY & TECHNOLOGY
COMMITTEE, MVC

A Michigan Perspective
By Michigan Senator Hoon-Yung Hopgood

Good afternoon. As the Michigan State Senator for the 8th District in Wayne County, bordering the Detroit River, I represent 260,000 residents in the "Great Lakes State". I am proud to share that Michigan boasts more than 3,000 (3,126) miles of Great Lakes shoreline -- more fresh water coastline than any other state -- with 40 of its 83 counties touching a Great Lake! The Great Lakes define Michigan literally and figuratively. Quite simply, the Great Lakes ARE Michigan.

According to the 2011 *Jobs, Economy and Great Lakes* report, more than 1.5 million Great Lakes-related jobs generated \$62 billion in wages in the region in 2009. A 2009 *Michigan's Great Lakes Jobs* report found that 23 percent of all Michigan's payroll depends on the Lakes.

Therefore, it's no surprise that adverse impacts to the Great Lakes adversely impact Michigan. Our industries, from manufacturing to agriculture, to tourism and recreation, to boating and fishing, are critically dependent on our waters. Threats to our Lakes, including contamination, invasive species and water withdrawals, endanger not only Michigan's environment, but also its livelihood.

Ontario Power Generation's permanent nuclear waste burial facility, proposed off the shores of Lake Huron, is no different. Despite all the computer modeling and studies, no one has, can or will guarantee that contamination from this unproven and untested method will not occur. As such, they cannot guarantee that our drinking water will remain safe and Michigan's economy and its vast industries will not be harmed.

These and other concerns are reflected in the letters attached to my written testimony from:

- the Michigan United Conservation Clubs
- the Michigan Boating Industries Association
- the Michigan Charter Boat Association
- the Michigan Steelhead & Salmon Fishermen's Association
- the Michigan Environmental Council
- the Michigan Clean Water Action

Unfortunately these organizations, like most Michigan residents, were not made aware of this proposal and the July 5 deadline to request participation.

Note, the Panel's own Guiding Principles state that "Public participation is a critical objective of the overall review process." Further, "Meaningful involvement in the environmental assessment can only take place when all parties have a clear understanding of the proposed project as

early as possible (in the review process).” Finally, the guidelines clarify that “*The Canadian Environmental Assessment Act does not exclude the public outside of Canada....*”

In an attempt to detail its Michigan outreach, OPG notes brief 20-minute presentations with a few organizations and a handful of closed-door, private meetings with select politicians and bureaucrats, some, four years ago. This is hardly public outreach. Still, of those who were briefed:

- the State Senator has cosponsored my resolution raising concerns about this project,
- the Congressman has sent a letter to the U.S. Department of State requesting their involvement,
- the County Commission has also approved a resolution raising concerns about the DGR, and
- two of the three environmental organizations have submitted letters of concern and the third is reportedly taking action through the International Joint Commission.

In addition, my resolution (**SR 58**) was fully vetted with Governor Snyder’s staff and the Michigan Department of Environmental Quality prior to the votes in the Senate Energy and Technology Committee and the full Michigan Senate, and neither opposed this legislation.

Regardless, no general public outreach has occurred in Michigan. There has been no public participation process. OPG did not host one public event in Michigan. Our citizens were never notified and their input was never sought. But, it’s not just about Michigan. All citizens living in Great Lakes states have a **right** to know about this proposal and should have been consulted. How can people possibly raise concerns about something they don’t know about? Shamefully, this highly controversial proposal with potentially grave impacts is largely unheard of.

Bringing greater public awareness to this issue remains one of my primary goals. Those efforts began with SR 58. Since then I have communicated through media and social networking sites, creating videos and sending numerous correspondences. Last month I hosted a standing-room-only town hall with my colleague Rep. Roberts to educate and inform our citizens. Of course, peoples’ reactions are virtually the same: passionate opposition. They are shocked that anyone would even consider such a threat to our Great Lakes, and that they had not heard about this before. While I continue to do all I can, I am still reaching too few Michigan citizens.

In May of this year, after learning about the DGR, I introduced SR 58. The resolution was passed unanimously and was cosponsored by 26 other Senators. Collectively the sponsors represent more than 7 million Michigan residents.

As you should already be aware, SR 58 raises six specific concerns that were formally brought to the Canadian Prime Minister’s, the Ontario Premier’s, the Canadian Nuclear Safety Commission’s and the Panel’s attention. They were detailed in the June 14, (2013) assessment that the Joint Review Panel requested of Mr. Neal Burnham of the U.S. Transboundary Affairs Division. The resolution also included specific recommendations and requests regarding these concerns; to date, there has been no response.

Mr. Burnham’s assessment suggested a number of actions, including confirming that the approach currently being proposed for the DGR is consistent with Michigan’s regulations. On this point, Mr. Glenn Sutton erroneously commented during his testimony that Michigan law

would allow the disposal of nuclear waste at sites adjacent to nuclear facilities. A closer look at Michigan statute demonstrates that is not correct.

First, the Michigan Low-Level Radioactive Waste Authority Act (PA 204 of 1987) establishes nine **minimum** siting criteria, including locations within ten miles of the Great Lakes and other connecting large bodies of water. Ultimately the law charged the Authority with establishing the **final** siting criteria. The Authority developed 31 comprehensive siting criteria used to identify three possible locations for a disposal site. These criteria eliminated 97% of Michigan from consideration, including all locations adjacent to a nuclear facility. Such sites were determined to be unacceptable for low-level radioactive waste disposal. Regardless, Michigan's Radioactive Waste Act (PA 113 of 1978) explicitly prohibits the underground storage or disposal of radioactive waste. OPG's DGR would NEVER be permitted under current Michigan law.

Mr. Burnham also recommended that the Panel confirm that OPG and the Canadian Nuclear Safety Commission have or will fulfill the requirements set out in the Joint Convention on the Safety of Spent Fuel, the Canada-U.S. Great Lakes Water Quality Agreement, and any other relevant international agreements. This was one of the specific concerns and requests detailed in SR 58. However, it is not known if these verifications have been made, nor have they been shared with me.

Mr. Burnham also notes that "The (Canada-U.S. Great Lakes) Water Quality Agreement requires that Canada and the U.S. notify each other of planned activities that could lead to a pollution incident or that could have a significant cumulative impact on the waters in the Great lakes, such as the storage of nuclear waste or radioactive materials." It seems that Canada has not provided any official notice regarding OPG's underground nuclear waste facility on Lake Huron, an apparent violation of this Agreement.

Additionally, Mr. Burnham suggests that the panel consider the adequacy of existing scientific data to support the appropriateness of the geological formation in response to the resolution's concerns about the unprecedented and unproven nature of the proposed use of the water-soluble limestone formation. As you know, the methodologies used in OPG's studies have been called into question by professionals.

The Michigan Department of Environmental Quality provided "limited comments" on the Environmental Impact Study, never expressly stating support for the project itself. However, the comments repeatedly note shortfalls in OPG's studies. In particular it cites a failure to explicitly answer the two questions posed as part of the geological study's report objectives. It also notes that some figures do not accurately reproduce the pressure distribution and that figures for dissolved solid concentrations are high for some formations. Finally, the MDEQ says that some of the studies may be "incomplete or inaccurate". This is not an impressive review for an entity seeking to be a pioneer with underground nuclear waste disposal.

Furthermore, the Panel's own consultant, Dr. Peter Duinker, solicited to evaluate OPG's approach and method in its environmental assessment gave a very damning report. Dr. Duinker concluded that OPG's analysis was not credible, not defensible, unclear, not reliable and inappropriate. What confidence can the people have in OPG and the entire environmental assessment process with this highly critical evaluation?

It seems integrity and quality regarding the Joint Review Panel's EIS process continue to be called into question. The Panel's own guidelines identify specific factors that must be considered, including:

- need for the project,
- alternatives to the project, and
- alternative means of carrying out the project that are technically and economically feasible.

By considering only one site – a site that poses a serious and direct threat to our Great Lakes – OPG clearly fails to address these factors. It is a glaring and unacceptable omission that a site away from the Great Lakes was never even contemplated; an omission you should not tolerate. Other locations off the Bruce Site must be considered. Even Michigan's laws pertaining to low-level radioactive waste explicitly require consideration of three alternatives, and Canada's regulations for municipal landfills demand more.

Finally, one of the looming issues is the **scope** of the DGR. It is proposed to include low- and intermediate-level nuclear waste. However, OPG has repeatedly referenced plans to include decommissioned wastes – a move that would double the facility. This constitutes a major expansion of the project that deserves to be addressed in this current process, not later.

OPG already addressed this matter in the '05 Hosting Agreement with Kincardine and adjacent communities by including specific provisions to allow for decommissioned waste (Section 5.1) and related payments for their support of including this waste (Section 5.2) at the DGR. So, if OPG claims it is not prepared to do so now, then the entire project should be put on hold until it is. Again, OPG is proposing to build a facility that is unprecedented and unproven anywhere in the world. It's full potential scope must be evaluated before it is permitted to do so.

The possibility of high-level nuclear waste is a concern as well. Despite claims that this facility will not accept such waste, there is nothing to ensure that will not occur in the future. While the Hosting Agreement does not specifically include high-level waste, nothing binds OPG to only low- and intermediate-level nuclear waste and nothing prevents an amendment to allow for high-level waste. What should happen if the agreement is terminated? What would prevent OPG from expanding the DGR for this purpose in the future? Not very much.

The people of Michigan have extensive concerns about this project and the process that has effectively excluded us from protecting the resource that is our life and livelihood. If you have been told otherwise, you have been misled. On their behalf, I implore you to recommend its denial. More questions are being raised than can be answered. There is simply far too much in jeopardy to move forward on a project that clearly deserves greater scrutiny and broader public input. Thank you.

MUCC.ORG

MICHIGANOUTDOORS.COM

Michigan United Conservation Clubs



517-371-1041 2101 Wood Street, PO Box 30235, Lansing, MI 48909 FAX: 517-371-1505

Conserving, Enhancing and Protecting Michigan's Natural Resources and Outdoors Heritage since 1937.

September 27, 2013

The Honorable Hoon-Yung Hopgood
Michigan State Senate
515 Farnum Building
Lansing, MI 48933

RE: Concerns over proposed OPG Nuclear Waste Repository along Lake Huron

Dear Senator Hopgood,

The Michigan United Conservation Clubs (MUCC) is a non-profit member-based organization with over 250 affiliated clubs and 42,000 members throughout the state of Michigan. For over 75 years, MUCC has united citizens to conserve, protect and enhance Michigan's natural resources and preserve our outdoor heritage through education, communication and advocacy.

We write to you today with grave concerns over the proposed construction and operation of a long-term underground burial facility for low and intermediate nuclear waste in Kincardine, Ontario, Canada. From what we understand, this facility will be constructed a mere half mile from the shore of Lake Huron and will store radioactive waste material that could remain toxic for over 100,000 years.

As you know, Lake Huron is a very important part of the Great Lakes ecosystem from which both Michigan and Ontario benefit. The Great Lakes fishery alone is worth over \$7 billion in economic benefit to the surrounding states and provinces, and our citizens rely on clean, healthy Great Lakes for drinking water and world-class recreational opportunities including fishing, swimming, boating, and other water-based tourism activities. Fish habitat in Lake Huron also supports world-class opportunities for lake trout, salmon and walleye fishing. These opportunities, plus the health of Great Lakes citizens and visitors, would all be at risk from dangerous releases from the proposed facility.

In the end, there are too many economic, ecological, and health concerns that are raised by the proposed construction of this nuclear waste facility so close to Lake Huron. The choice seems clear: we cannot afford such an incredible risk so close to such an incredible resource.

Yours in Conservation,

Erin McDonough
Executive Director



**Michigan®
Boating
Industries
Association**

September 26, 2013

Senator Hoon-Yung Hopgood
Michigan Senate
25953 Labana Woods Dr.
Taylor, MI 48180

Dear Senator Hopgood,

The Michigan Boating Industries Association, representing more than 300 marine businesses in Michigan, resoundingly supports your SR 58 and the efforts to stop the Ontario Power Generation (OPG) from constructing an underground long-term burial facility for Ontario's low and intermediate nuclear waste at the Bruce Nuclear Generating Station.

Knowing what we know about the geological repository in Maxey Flats, Kentucky, this action would be extremely irresponsible and an incredibly dangerous threat to the Great Lakes, as well as to the people and industries which depend on them.

The impact of radioactive water could be devastating to Michigan and all states surrounding the Great Lakes. The Great Lakes are the largest group of freshwater lakes on the planet. They provide drinking water to 40 million people, and are essential to Michigan's fishing, boating, recreation, tourism, agriculture and other industries that are dependent on pristine waters. According to the eight-state Great Lakes Commission, the Great Lakes support 1.5 million jobs that generate \$62 billion in wages annually in the region.

The MBIA strongly opposes the OPG plan and respectfully asks the Joint Review Panel to search for a better alternative. There is too much at stake including the lives and livelihood of millions of people residing in the Great Lakes Region. The lack of consideration regarding the impacts, and the late notice and limited opportunity for input from boating, fishing and consumer groups is of grave concern to the MBIA.

Sincerely,

Nicki Polan
Executive Director

Michigan Boating Industries Association
32398 Five Mile Road, Livonia, MI 48154
P: 734.261.0123; F: 734.261.0880; E: boatmichigan@mbia.org; W: mbia.org



Michigan Steelhead & Salmon Fishermen's Association

Protecting, promoting and enhancing sport fishing in the Great Lakes and connecting waterways.

Dennis H. Eade
Executive Director
2355 Timberlee Dr
Holland, MI 49424
Ph: 616-298-8842
Fax: 616-298-8847
deneade@charter.net

The Honorable Hoon-Yung Hopgood
Michigan State Senate
515 Farnum Building
Lansing, MI 48933

Dear Senator Hopgood,

The Michigan Steelhead & Salmon Fishermen's Association is the largest sport fishing organization in the Great Lakes Basin. We represent thousands of sport fishers and environmentalists throughout the basin. We strongly oppose Ontario Power Generation's dangerous scheme to locate an underground nuclear waste repository less than a mile inland from the shore of Lake Huron and the drinking water of 40 million people.

OPG has chosen a site for storing potentially 200,000 cubic meters of radioactive waste in a geological formation made of limestone, the first of its kind. Putting 20% of the world's fresh water at risk of contamination is just wrong and cavalier at best. We encourage the use of sound scientific principles and analyses in determining the best geologic formation for the safe long-term storage of this radioactive waste before making any further approvals of this proposed site.

We urge the Michigan Senate and all responsible governmental and private entities to oppose this action by Ontario Power Generation and pursue all means available to convince the Prime Minister of Canada, the Premier of Ontario, the President of the Canadian Nuclear Safety Commission, the Chairman of the United States Nuclear Regulatory Commission, the President of the United States Senate, the Speaker of the United States House of Representatives, and the members of the Michigan congressional delegation to join in opposition to this proposed action.

M.S.S.F.A. agrees with a non-profit organization of concerned Canadians who said, "The protection of the Great Lakes from buried radioactive nuclear waste is responsible stewardship and is of national and international importance. To protect our precious natural resource and the welfare, health and safety of the millions of people today and the innumerable generations who will follow, radioactive nuclear waste should not be buried anywhere in the Great Lakes Basin."

Sincerely,

Dennis H. Eade

September 28, 2013

Capt. Terry R. Walsh, President
Michigan Charter Boat Association
222 Grim Road
Bentley, Michigan 48613

The Honorable Senator Hopgood
State Capitol
Lansing, Michigan

Suggesting to another country, especially our Canadian neighbors, why they should or should not do something, is a delicate matter. However, when their potential action could have grave consequences for one of the world's freshwater lakes and all who depend on it for a quality source of water, we must set forth our concerns.

The potential long-term consequences of a nuclear waste site so close to Lake Huron, should anything go wrong, are unfathomable. Both our country and theirs share the same waters, and a decision of such magnitude should not be made without the input of America's top nuclear waste scientists as well.

Be it therefore resolved the Michigan Charter Boat Association joins with you in fully endorsing Resolution SR 58, which addresses our grave concerns of Canada's proposed nuclear waste site so close to one of the world's largest freshwater lakes.

Respectfully,

Capt. Terry R. Walsh, President
Michigan Charter Boat Association



September 27, 2013

Joint Review Panel Secretariat – DGR
c/o Canadian Nuclear Safety Commission
P.O. Box 1046, Station B
280 Slater St., Ottawa, ON K1P 5S9

RE: DGR Joint Review Panel Public Hearing--Peter Duinker Environmental Assessment Report

Dear Joint Review Panel:

The Michigan Environmental Council urge you to deny Ontario Power Generation's request for a license because of OPG's failure to fully and meaningfully consider alternatives to siting the project at the Bruce site close to Lake Huron.

Ontario Power Generation's proposal to construct an underground, long-term burial facility for all of Ontario's low and intermediate level radioactive waste at the Bruce Nuclear Generating Station, is less than a mile inland from the shore of Lake Huron and about 440 yards below the lake level and is approximately 120 miles upstream from the main drinking water intakes for Southeast Michigan. The intermediate waste is long-lived and would provide a risk to the lakes for generations.

We encourage the use of sound scientific principles and analyses in determining whether this geologic formation is appropriate for the safe long-term storage of radioactive waste and that before making any further approvals of this proposed facility. Siting an underground nuclear waste repository in limestone, as proposed by Ontario Power Generation, is the first of its kind. The environmental impact statement for this proposed nuclear waste burial facility noted that the acceptability of an alternative site was unknown.

Analysis of alternative sites is a critical part of environmental assessment which was not thoroughly covered in Peter Duinker's Environmental Assessment Report and must be carefully considered by the Panel.

As part of an effort to protect water quality, Michigan's siting criteria for the disposal of low-level radioactive waste prohibits any site located within ten miles of Lake Michigan, Lake Superior, Lake Huron, Lake Erie, the Saint Mary's River, the Detroit River, the St. Clair River, or Lake St. Clair. It also excludes sites located within a 500-year floodplain, located over a sole source aquifer, or located where the hydrogeology beneath the site discharges groundwater to the land surface within 3,000 feet of the boundaries of the site. We encourage Canada to consider similar siting criteria.

A robust evaluation of alternative sites is not only required by law but also essential to reaching an informed decision. The unique elements of the project, such as its nearly unprecedented reliance on limestone to contain emissions from nuclear waste and, most notably, the site's proximity to Lake Huron, demand that OPG take seriously its obligation to consider alternative sites. Unfortunately, the process employed and supporting information provided by OPG to this point do not reflect sufficiently careful analysis of alternative sites.

The importance of preservation of the Great Lakes to the economies of both Canada and Michigan cannot be overstated. Our water resources not only provide drinking water to tens of millions of people, but are also critical to fishing, boating, recreation, tourism, and agriculture in both Canada and the Great Lakes states.

The Great Lakes should not be put at risk merely because locating the project at the Bruce site may be a path of low local community resistance. Without a substantial and good faith analysis of alternative siting options, OPG cannot meet its burden of thoroughly evaluating feasible alternatives.

Sincerely,

A handwritten signature in black ink, appearing to be 'J. Clift', written in a cursive style.

James Clift, Policy Director
Michigan Environmental Council



CLEAN WATER ACTION

MICHIGAN

September 30, 2013

To whom it may concern,

On behalf of Michigan Clean Water Action's 200,000 plus members I urge the Joint Review Panel for the Ontario Power Generation Deep Geologic Repository to oppose further development of this project and seek alternatives to long-term nuclear waste storage issues.

As stewards of the Great Lakes and the one fifth of the world's fresh water they embody it is our moral imperative to act responsibly and consider the ecological, public health, and economic ramifications when making decisions about nuclear waste.

The risk of potential disaster is too great. Nuclear waste cannot be cleaned up or removed from water. The Great Lakes are home to one of the most diverse ecological systems in North America. Radioactive water would have untold devastating impacts these plant and animal species.

More than 40 million people draw drinking water from the Great Lakes. The public health impact of this populace ingesting and being exposed to radiation must also be considered. Our state's largest population centers rely on good water quality for everyday needs like cooking, bathing, laundry, and irrigation.

Finally, the panel should consider the impact of millions of dollars from the tourism, fishing, recreation, and boating industry. Truly our greatest economic asset is our water. More must be done to protect and preserve this invaluable treasure for future generations.

The health of our Great Lakes is under constant threat from industrial pollution, surface runoff, sewage overflows, toxic discharge from power plants now is the time to act boldly and ensure our water quality remains among the highest in the world – not add another threat to this ever growing list.

For the Great Lakes,

Nic Clark

Michigan Director
Clean Water Action