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Oral intervention from

Citizens' Clearinghouse on Waste Management

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

Intervention orale par

Citizens' Clearinghouse on Waste Management

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

Canada

Submission on Cumulative Effects Assessment

In

OPG's Deep Geologic Repository Project

For Low & Intermediate Level Waste

Environmental Impact Assessment

Submitted by: John Jackson

Citizens' Clearinghouse on Waste Management

August 12, 2013

Submission on Cumulative Effects Assessment In OPG's Deep Geologic Repository Project For Low & Intermediate Level Waste Environmental Impact Assessment

Critical Importance of Cumulative Effects Assessment (CEA)

Concern about cumulative environmental change has led to cumulative effects assessment (CEA) requirements in most environmental assessment processes.

The definitions for cumulative effects vary. The following gives a sense of the nature of this type of assessment:

> Various definitions for cumulative effects have been proposed in the literature, for example:
> - the accumulation of human-induced changes in VEC's [Valued Ecosystem Components] across space and over time that occur in an additive or interactive manner (Spaling, 1997);
> - the result of individually minor but collectively significant actions taking place over a period of time (US CEQ, 1978);
> - changes to the environment caused by an action in combination with other past, present, and future actions (Hegmann et al., 1999).[1]

CEA is the most significant part of an environmental assessment in terms of giving the public and the decision-makers the basis for coming to conclusions around proposed activities or facilities and the possible cumulative environmental changes that could result. CEA provides people with an understanding of what a project in combination with other threats in the community could mean for the places where they live and for the features of the environment that they value – not just for now and in the near-future, but also for future generations. Roger Creasey and William A. Ross, environmental assessment experts and practitioners,[2] have said:

> It is worth noting that cumulative effects are the effects that people notice, and as such, they are the effects of concern to people. People care about the quality of water and air, not about whether one source or another is responsible for contaminating water or air. That is why it is essential for project decision makers to pay attention to cumulative effects rather than to single project effects. In turn, this is why good EIA [Environmental Impacts

[1] Bram F. Noble, *Introduction to Environmental Impact Assessment: A Guide to Principles and Practices*, 2006, p. 158.

[2] Creasey and Ross are professors of environmental science at the University of Calgary. Creasey is also manager of Ecosystem Management at Shell Canada.

> Assessment] legislation requires that cumulative effects be assessed before project decisions are made.[3]

Two other experts in the environmental assessment field, Peter N. Duinker and Lorne A. Greig,[4] have concluded that "cumulative effects are the only real effects worth assessing in most EIAs."[5]

In the case of the OPG's Deep Geologic Repository Project for Low & Intermediate Level Waste (DGR-L&ILW), we are talking about a project that involves wastes that are among the most threatening in the long-term. OPG states that the intermediate level wastes contain "significant quantities of long-lived radionuclides;"[6] these will not reach background levels for radioactivity for about 100,000 years.[7] The wastes also would contain substantial quantities of persistent toxic substances.[8]

In addition, the proposed site is less than a kilometer from a sensitive receptor of major significance to millions of people – Lake Huron. Second largest of the North American Great Lakes by surface area (third largest freshwater lake by area in the world), the Lake Huron watershed is home to approximately 2.5 million people as well as major populations of fauna and flora, and the drinking water source for 1.5 million people.[9] The Canadian and U.S. governments have concluded that the state of the Lake Huron ecosystem is "mixed and improving."[10] They go on to emphasize that "many changes are occurring rapidly on Lake Huron" and describe major "pressures on the system."[11] They also point out that Lake Huron has a retention time of 22 years. The governments have concluded that "this long retention time and large surface area have resulted in the build up of persistent substances that bioaccumulate in fish and wildlife."[12] As the middle lake in the Great Lakes system, the condition of Lake Huron is critically important not just for those around this

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[3] Roger Creasey & William A. Ross, "The Cheviot Mine Project: Cumulative Effects Assessment Lessons for Professional Practice," *Environmental Impact Assessment: Practice and Participation*, 2009, p. 159.
[4] Peter Duinker is in the School of Resource and Environmental Studies at Dalhousie University; Lorne Greig works for ESSA Technologies Ltd.
[5] Peter N. Duinker & Lorne A. Greig, "The Impotence of Cumulative Effects Assessment in Canada: Ailments and Ideas for Redeployment," *Environmental Management*, Vol. 37, No. 2 (2006), pp. 157.
[6] *OPG's Deep Geologic Repository for Low & Intermediate Level Waste, Environmental Impact Statement: Volume 1: Main Report*, March 2011, page 4-18.
[7] OPG Environmental Impact Statement Summary, March 2011, p. 11.
[8] OPG EIS, Volume 1, Table 4.5.3-1
[9] Lake Huron Initiative, *Lake Huron Update, 2000/2001*.
[10] Environment Canada & U.S. Environmental Protection Agency, *State of the Great Lakes 2005*, p. 37.
[11] *State of the Great Lakes 2005*, p. 37.
[12] *State of the Great Lakes 2005*, p. 38.

Lake, but also for the lakes and rivers downstream from it in the Great Lakes system.

Finally, this project is laden with unknowns and dubious assertions. The project assessment of possible impacts is heavily dependent upon modeling, probability assessments, and assumptions that nothing dire could happen in the short or long term. Submissions from our colleagues such as the International Institute of Concern for Public Health and Northwatch show these assertions by OPG to be untrue. In a situation of so many unknowns a strict thorough cumulative effects assessment becomes even more important.

For the reasons listed above, it is essential that OPG's DGR-L&ILW environmental assessment include an in-depth high quality CEA.

The Criteria for Assessing the DGR's Cumulative Effects Assessment

The conclusion of OPG's cumulative effects assessment is that "No residual cumulative effects were identified."[13]

This is an astonishing conclusion. Nothing that we do has zero cumulative effects. The assertion of "***No*** residual effects" throws into question the validity of their entire environmental impact statement upon which this finding is based.

In terms of the OPG's CEA analysis, it strictly follows the EIS Guidelines for this project and the Canadian Environmental Assessment Agency's Cumulative Effects Assessment Practitioners Guide.[14]

Peter N. Duinker and Lorne A. Greig, long-time students and practitioners of cumulative effects assessment, say the following:

> We have come to the conclusion at this time that the promise and the practice of CEA (cumulative effects assessment) are so far apart that continuing the kinds and qualities of CEA currently undertaken in Canada is doing more damage than good.[15]

OPG's strict adherence to these very limited and seriously flawed guidelines means that the public and the decision-makers have not been given a serious picture of possible cumulative environmental change as a result of their proposed project.

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[13] OPG EIS, Volume 1, p. xiv.
[14] OPG EIS, Volume 1, p. 10-1.
[15] "The Impotence of Cumulative Effects Assessment in Canada: Ailments and Ideas for Redeployment," op. cit., p. 153.

Therefore, in our submission on OPG CEA, we make our assessment not just on the basis of the government guidelines, but also on the basis of what is necessary in order to have a truly valid picture of possible cumulative changes to the environment.

In its March 2013 decision on a request from the Saugeen Ojibway Nations,[16] the Deep Geologic Repository Joint Review Panel rejected the request citing as the basis for their decision the *Terms of Reference for the Review* and the *Guidelines for Preparation of the Environmental Impact Statement for the Deep Geologic Repository for Low and Intermediate-Level Radioactive Wastes*. Without getting into a debate on the Panel's interpretation and application of the TOR and Guidelines, we wish to stress that the TOR and Guidelines are very limited and result in an inadequate cumulative effects assessment. We recognize that the Review Panel is bound by the TOR and the Guidelines in making its decision. However, we urge the Panel to ensure in its decision that it does not give the resultant CEA the credibility of assuming that it truly describes potential cumulative changes to the environment.

Limitations of OPG's Cumulative Effects Assessment

OPG's CEA fails to give the public and decision-makers a true picture of the possible cumulative environmental changes that could result from its project. In this section, we point out the serious limitations in the CEA process.

Failure to Conduct CEA of Alternative Ways of Addressing the Problem

As we have stated, the CEA analysis gives us the best understanding of the implications of an undertaking for the long-term well-being of the environment and the community. Therefore, possible cumulative effects should be part of the alternatives assessment because this should be central to the decision-maker's determination of which alternative would be best to address the problem.

OPG carried out a CEA only on its chosen alternative. In response to a question on how the cumulative effects assessment informed the evaluation of alternative means of carrying out the project, OPG said: "The cumulative effects assessment did not inform the evaluation of alternative means of carrying out the project or the selection of the preferred project."[17] The U.S. Environmental Protection Agency has stated" "CEQ's [Council on Environmental Quality] regulations (CEQ, 1987) explicitly

[16] Deep Geologic Repository Joint Review Panel, "Subject: Deep Geologic Repository Joint Review Panel – decision on request to include the Adaptive Phase Management (APM) siting process in the cumulative effects analysis for the Deep Geologic Repository for Low and Intermediate Level Radioactive Waste project review," March 27, 2013.

[17] *Consolidated Responses to JRP's Information Requests for Deep Geologic Respository Project for Low and Intermediate Level Waste*, IR# EIS-08-360.

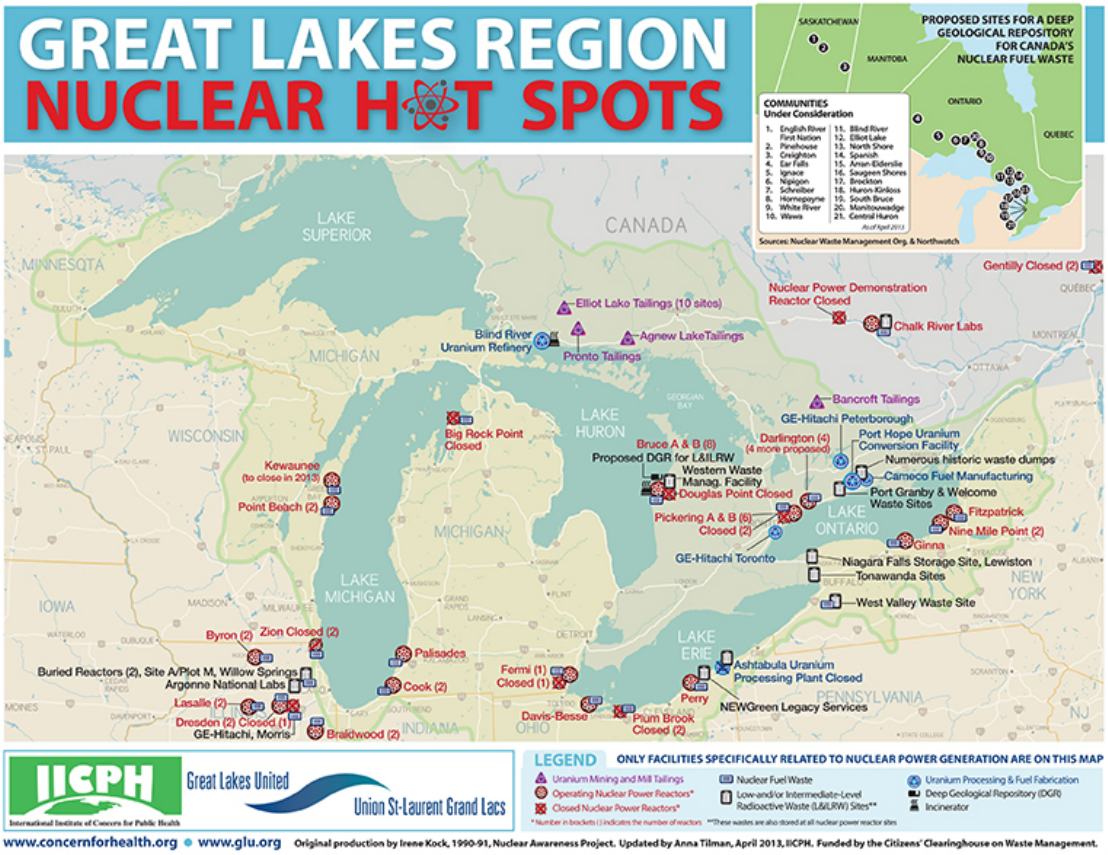
state that cumulative impacts must be evaluated along with the direct effects and indirect effects of each alternative."[18]

Alternatives could result in different cumulative effects. For example, would moving all the wastes to one community result in greater cumulative effects for that community?

Severely Limiting the Geographic Scope of the Analysis

OPG has limited the scope of their analysis to a geographically narrow area. Perhaps most significantly, they define the study area as extending only a few kilometers into Lake Huron. A facility that would be located within a kilometer of the shore of the Lake certainly has the potential to have effects in the Lake and those effects would not be limited to the nearshore.

In looking at possible cumulative effects on Lake Huron, it becomes essential to look at other possible sources of radioactive substances to Lake Huron. The Citizens' Clearinghouse on Waste Management, Great Lakes United, and the International Institute of Concern for Public Health updated a Great Lakes Region Nuclear Hotspots map in April 2013.



[18] *Consideration of Cumulative Impacts in EPA Review of NEPA Documents*, May 1999, p. 2.

As shown by this map, there are many nuclear facilities around the Lake Michigan-Lake Huron watershed. OPG has not included any of the following nuclear facilities within this watershed in its CEA:

1. The very recently permanently closed Kewaunee Nuclear Power Plant in northern Wisconsin, on the Lake Michigan shoreline;
2. The Point Beach Unit 1 and 2 atomic reactors in northern Wisconsin, on the Lake Michigan shore;
3. The permanently closed Zion Units 1 and 2 atomic reactors in northern Illinois, on the Lake Michigan shore;
4. The Cook Units 1 and 2 atomic reactors in southwestern Michigan, on the Lake Michigan shore;
5. The Palisades atomic reactor in southwestern Michigan, on the Lake Michigan shore;
6. The permanently closed Big Rock Point atomic reactor in northwestern Michigan, on the Lake Michigan shore;
7. The Blind River Uranium Refinery on the north shore of the north channel of Lake Huron (including recent proposals to incinerate radioactive waste oils, under consideration for approval by the Canadian Nuclear Safety Commission, making this, too, a reasonably foreseeable activity);
8. Uranium mining and mill tailings at Elliot Lake (10 separate sites), Pronto, and Agnew Lake, located on the north channel of Lake Huron.

It is also important to note that each of these power plants (whether operating or closed) has nuclear wastes on site.

In addition, there are the facilities already at the Bruce site. OPG has included these in its CEA.

When there are already so many sources of radioactive materials to Lakes Michigan-Huron, what does it mean to add yet another potential source of on-going or accidental release? Clearly this needs to be included in a cumulative effects assessment.

The Canadian and U.S. governments are concerned about non-radioactive substances in Lake Huron. As was said earlier in this submission, the governments are concerned that Lake Huron's "long retention time and large surface area have resulted in the build up of persistent substances that bioaccumulate in fish and wildlife."[19] The wastes the OPG is talking about also contain non-radioactive toxic substances. Therefore, the cumulative effects assessment should include the effects that toxic substances could have on Lake Huron and the lives that depend on that Lake for their well-being.

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[19] *State of the Great Lakes 2005*, p. 38.

Severely Limiting the Possible Future Facilities that it includes in its CEA

OPG scopes out future projects to include in the CEA in two main ways:

1. OPG only looks at possible future projects that could occur "within the reasonably foreseeable future (i.e., until decommissioning of the DGR in approximately 50 years)."[20] There is no valid reason for taking this approach. As the U.S. Environmental Protection Agency has said: "The most common temporal scope is the life of the project. This may not be appropriate if the effects last longer than the project's useful life."[21] The DGR and its wastes won't magically disappear after 50 years. Since some of them continue to be toxic for at least a hundred thousand years, OPG's cumulative effects assessment should not exclude facilities that may be built after 50 years.
2. OPG only looks at "reasonably foreseeable projects and activities", which it defines as "projects that have started in the approval process and are on the path to obtaining approval. This category would also include smaller routine activities that one can say, with a fair degree of certainty, will need to occur…"[22] This definition is very restrictive and defeats the purpose of a serious CEA. As the U.S. EPA said:

> The critical question is "What future actions are reasonably foreseeable?". Court decisions on this topic [in the U.S.] have generally concluded that reasonably foreseeable future actions need to be considered even if they are not specific proposals.[23]

Environmental assessment experts Peter Duinker and Lorne Greig condemn this restrictive approach to inclusion of possible future activities:

> A CEA that takes a short-term, narrowly focused, "most likely" approach to the development future is doomed (Greig and others, 2004). Because VEC [Valued Ecosystem Components] sustainability is a long-term concept, short-term futures may miss vital pressures from developments just beyond the study's horizon. Narrowly focused scenarios may miss whole sets of future activities that bring strong pressures on VEC's (see also Mulvihill 2003).[24]

The most egregious example in the OPG's CEA of leaving out a major possible facility is the omission of a possible DGR for nuclear fuel waste.

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[20] OPG EIS, Volume 1, p. 10-6.
[21] *Consideration of Cumulative Impacts in EPA Review of NEPA Documents*, op. cit., p. 8.
[22] OPG EIS, Volume 1, p. 10-1.
[23] *Consideration of Cumulative Impacts in EPA Review of NEPA Documents*, op. cit., p. 13.
[24] Op cit., p. 158.

The Nuclear Waste Management Organization is currently in the siting process for a deep geologic repository for all of Canada's nuclear fuel waste. Six of the twenty-one communities currently under active consideration as the possible home for this facility are in the OPG's Study Area. The facility, if built, would handle and hold four million fuel bundles or more.[25] However, OPG does not include this massive possible facility in its CEA because it would not be operating in 50 years and because it is not now in the approval process.

The omission of just this one possible facility is significant enough to make OPG's entire CEA worthless.

Severely Limiting CEA by Omitting Uncertainties and Omitting Items if OPG does Not Consider them to be Significant

OPG concludes their CEA by stating that "no adverse effects were identified."[26] This is their recurring assertion. This conclusion is more categorical, however, than the Table 10.7-1, which is immediately after this conclusion. This chart repeatedly says "No likely adverse cumulative effects."

Throughout its environmental impacts assessment, OPG either totally denies the possibility of negative effects as a result of their project, or finds them to be insignificant. We have not had the access to expertise or time to assess the validity of the OPG's conclusions about significance. But as mentioned earlier in our brief, submissions from our colleagues such as the International Institute of Concern for Public Health (IICPH) and Northwatch show these assertions by OPG to be untrue. For example, the IICPH submission states:

> No computer models upon which the long-term safety of DGRs is predicted can accurately take into account all the complexities that could compromise the integrity of the DGR. Natural systems are far too complicated and ever-changing for a complete, accurate model to be possible.

The staff of the Canadian Nuclear Safety Commission also pointed out uncertainties:

> … uncertainties exist in the long-term safety case due to uncertainties in the geosphere, which creates uncertainties in the repository design and therefore uncertainties in the safety assessment.[27]

Despite finding these uncertainties, the Canadian Nuclear Safety Commission staff concluded that OPG's planned methods to address uncertainties are "acceptable."

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[25] Nuclear Waste Management Organization, *Description of Canada's Repository for Used Nuclear Fuel and Centre of Expertise*, October 2012, p. 5.
[26] OPG EIS, Volume 1, p. 10-38.
[27] Canadian Nuclear Safety Commission, *Ontario Power Generation: Long-term Safety Case for the Deep Geological Repository (DGR) Project for Low and Intermediate Level Waste*, July 18, 2013, p. 38.

This does not mean, however, that these uncertainties should not be taken into account in the CEA.

OPG implies that impacts are non-existent or insignificant. The U.S. Environmental Protection Agency does not consider insignificance to be a valid reason for leaving an activity out of a cumulative effects assessment. The U.S. EPA has said:

> The combined, incremental effects of human activity, referred to as cumulative impacts, pose a serious threat to the environment. While they may be insignificant by themselves, cumulative impacts accumulate over time, from one or more sources, and can result in the degradation of important resources.[28]

Conclusion and Recommendation to Joint Review Panel

As shown above, OPG's cumulative effects assessment fails to give the community and the decision-makers a fair picture of the cumulative environmental change that this project could be part of. The prime ways in which the cumulative effects assessment errs or misleads are:

- Failure to Conduct CEA of Alternative Ways of Addressing the Problem
- Severely Limiting the Geographic Scope of the Analysis
- Severely Limiting the Possible Future Facilities that it includes in its CEA
- Severely Limiting CEA by Omitting Uncertainties and Omitting Items if OPG does Not Consider them to be Significant

These flaws are so basic that OPG's conclusion in its cumulative effects assessment that "no adverse effects were identified" has no credibility.

Recommendation 1: We ask the Joint Review Panel to find that OPG's cumulative effects assessment does not provide the basis to accept OPG's conclusion of "no adverse effects."

In some of the cases, these flaws are inadequacies within OPG's analysis and provide you with the basis to reject the CEA and the environmental assessment. In other cases, especially items 2 & 3 above, OPG may have acted within the Guidelines for this environmental assessment and thus put you in a position where you cannot reject the cumulative effects assessment on those bases alone.

The Joint Review Panel should point out in its final decision that, because of the severe limitations in the CEA Guidelines, the community and decision-makers are not receiving an in-depth picture of possible cumulative environmental changes.

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[28] *Consideration of Cumulative Impacts in EPA Review of NEPA Documents*, op. cit., p. 2.

Recommendation 2: We urge you to ask the governments to reassess their guidelines for cumulative effects assessments and to consult with the public as they go through that reassessment process.

If OPG had chosen to be a good community member, it would have gone beyond the limitations in the government guidelines. OPG could have chosen to provide a much more meaningful assessment of possible cumulative environmental changes. Unfortunately, because it did not so choose, the public and the decision-makers have not been given the basis to obtain a truly valid picture of possible cumulative changes to the environment.