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Oral intervention from

The Inverhuron Committee Inc.

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

The Inverhuron Committee Inc.

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

Deep Geologic Repository Joint Review Panel

Written Submission in Support of
an Oral Intervention from

The Inverhuron Committee Inc.

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

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August 12, 2013

Good day members of the Joint Review Panel. My name is Marti McFadzean. I am speaking to you today as the Chair of The Inverhuron Committee. We are an incorporated group of citizens representing Inverhuron, a long-established community that is part of the larger Municipality of Kincardine. We applied to intervene at this hearing because our concerns are similar in nature to those who wish to protect the Great Lakes for future generations. As well, being the closest neighbour to the proposed site of the repository, we feel it is our responsibility to share local concerns that, to date, have gone unheeded by our own Municipality.

Concerns Relative To The Global Environment

The Inverhuron Committee has studied all aspects of the proposed deep geologic repository project, and it has concluded that there are key issues of importance to all citizens that require further consideration.

Some of these issues are the following:

a) The lack of due diligence in the location for this project since Kincardine alone was studied;
b) The concern over this repository being the first one to be built in argillaceous limestone and therefore experimental in nature;
c) The history around the world of other repositories that have allowed water to enter the site and have contaminated the surrounding land and ground water;
d) The proximity to Lake Huron, which provides the drinking water to 40 million citizens and contains 21% of the world's fresh water, when water itself is becoming labelled the "gold" of this century;
e) The need to consult a wider audience because the issue of nuclear waste should require more than an environmental assessment of the area within a ten or twenty kilometre radius. This issue is an ethical, social and

political question that must be decided democratically by all citizens connected to the Great Lakes;

f) The development of new technology which may change the way that we deal with nuclear waste (i.e., the fast-neutron reactors that have been developed within the last generation to burn 85% of the uranium fuel bundles and leave reusable waste); and
g) Acknowledgement of the Golder and Associates Report, which indicated that leaving the waste in situ, repackaging it above ground or building a repository were all acceptable options.

With the above in mind, we can only conclude that to construct a deep geologic repository at the proposed site is dangerous, which leads us to ask the Joint Review Panel to deny this project.

You have heard, via the submission process, from many Canadian and American citizens who have the same and other concerns and, in such numbers, that these issues need more study and discussion before a decision is made about the disposal of nuclear waste.

A Recent Concern That Has Been Raised:

A wider profile of the waste to be housed in the low and intermediate level repository

The Memorandum of Understanding signed by the Municipality of Kincardine in 2002 and the Hosting Agreement that was signed in the Fall of 2004 committed the Municipality of Kincardine and Ontario Power Generation to more permanently house low level waste and intermediate level waste at the Bruce Nuclear site. Page 10 of Ontario Power Generation's Environmental Impact Statement Summary indicates that low level waste consists of "mops, paper

towels, temporary floor coverings, floor sweepings, protective clothing and hardware items such as tools."

This same document indicates that the majority of these wastes are processed through "incineration or compaction for volume reduction". In fact, the estimate at that time was that 90% of the waste housed in the repository would consist of this low level waste in an incinerated fashion.

The 2004 Golder and Associates Report that was presented to and approved by the Kincardine Municipal Council contained various estimates around the disposal of waste and the inherent cost in each of these. On pages 6 and 7, they estimate that there will be 77,000 m^3 (85%) low level waste and 15,000 m^3 (15%) intermediate level waste at the Western Waste Management Facility (WWMF) site by 2042, making a total of 92,000 m^3. In Section 2.4.4, a deep rock vault is modeled. It is indicated that these vaults will have a total capacity of 130,000 m^3 and are expected to handle 115,000 m^3 of low level waste, comprised of 33,000 waste packages retrieved from the WWMF. Golder indicated that, while the option would be intended to accommodate intermediate level waste, "the current design and cost estimate do not include this waste". The cost estimate in Table 8 of this report is $927 million for a deep rock vault versus $648 million for the status quo method.

The October 24, 2012 letter from Ontario Power Generation to Dr. Stella Swanson contains a new estimate in section EIS 05-225 of $2.1 billion and EIS 09-463 contains a new total capacity of 203,995 m^3. The cost has grown by 1.2 billion and additional waste of 70,000 m^3 has 61% low level waste and 39% intermediate level waste.

These changes in both overall capacity, percentages of low level to intermediate level waste and the project cost estimates result in us wondering what the final

repository will look like. In fact, it appears that an initial majority low level waste project has changed to highly toxic, long term radioactive material.

To add to the seeming elasticity of the project, in early June when we met with Ontario Power Generation personnel, their representatives indicated to our group that the decommissioned waste was still a question mark. However, this issue has come up recently in the media and Ontario Power Generation has indicated that they are looking for a site.

This leads us to ask the following pertinent questions:

1) Could the decommissioned waste also be placed in the Kincardine repository based on the elastic cost estimates as well as the varying size of the repository?
2) Would the 30 hectare operation to hold 200,000 cubic metres of waste need to be doubled at the Bruce site if additional waste is added to the project?
3) Would there be no requirement for a new environmental assessment if the percentage of low to intermediate level waste remains the same by expanding the footprint of the repository?
4) Considering the already staggering cost of this project, will the high level waste be added to this project by a decision of politicians who are feeling the pressure of the cancelled gas plant, the mega-quarry and other projects that have been costly and then cancelled?
5) If so, will this project be modified without a further cumulative environmental assessment?

The above concerns were affirmed recently, in a document submitted to the Joint Review Panel on July 19, 2013, Ontario Power Generation stated that merely the dissemination of information to the public would be required in order to change the profile of the waste to be deposited in the repository, or the configuration of

the repository, or the characteristics and/or sources of the waste, the capacity, the life cycle schedule, monitoring or socio-economic considerations. A communication plan would be prepared, according to item 079 in the Commitment Document (taken from the Environmental Impact Statement, 00216-REP-07701-00001, section 4.11.3 4th para., 2nd sentence), to govern how the "information would be relayed for each proposed modification to the DGR Project."

This gives an unacceptable amount of scope for the proponent to be able to drastically change this project if a licence is granted by the CNSC. The project appears to be a foot-in-the-door proposal without a delineated design, mandate or containment profile.

Considering all of the above information from various experts in the field of geology, the Joint Review Panel must adhere to the "precautionary principle" that is their mandate as the guardians of our lakes. We cannot allow the proponent to disregard the concerns of other Canadian Government Departments, expert testimonials, and scientists to push forward their plan.

Comments Regarding The Geology Of The Lake Huron Shoreline

Ontario Power Generation presented their geology study to us at a site visit June 4, 2013. We are not in position to refute their study but we continue to be concerned about the limestone and shale that form the basis of the rock in this area. In the transcripts of the Bruce New Nuclear Power Plant Project Joint Review Panel of June 26, 2009, Ms. Janette Anderson, the expert presenter regarding the geology of Lake Huron, spoke to the formation of Lake Huron and the geology of the lake. On page 6 of the transcript, Ms. Anderson said, "Another interesting finding which was fairly recent is the deep sinkholes discovered at the

bottom of Lake Huron. The large portion of the bedrock that's 40 million years old beneath Lake Huron is karst limestone. It's relatively soft."

We decided to follow up on this section of the transcript and found ongoing research being done by Dr. Bopaiah Biddanda of Michigan's Grand Valley State University and Russ Green of the Thunder Bay National Marine Sanctuary, who are studying the lake bottom and shore of Lake Huron. Their recent research indicates "from 10,000 to 8,000 years ago, Lake Huron's limestone bedrock was exposed due to extremely low lake levels following the last glacier maximum. Karst sinkholes were created when a chemical reaction between limestone and acidic water dissolved away passages or holes in the rock, leaving behind weakly supported ceilings that could easily collapse or sink. The Lake Huron sinkholes were subsequently covered with ground water to the bottom of the lake, providing a unique habitat for aquatic life." These sinkholes are predominantly located at the shoreline and slightly interior to the coastline. The research that is being done by these two scientists is significant enough to reinforce the concern that we have about the geology of the lakebed and underlying rock.

In addition, we have spoken to Dr. Charles Rhodes and read his recent work on the appropriateness of the geology of the Bruce area relative to the construction of a deep geologic repository. Dr. Rhodes is adamant that the repository requires an elevation (such as that reflected in the Yucca Mountain site in the United States) in order to ensure that no water will infiltrate the repository. Dr. Rhodes suggests that the entire concept of digging a 600 m deep hole below the level of Lake Huron with a large chamber (160,000 m^3) at the bottom in which to bury nuclear waste is fraught with ground water and subsurface rock related cost escalation and performance risks.

Dr. Rhodes suggests that there will be prolonged seepage of water in the ground surrounding the repository and this seepage will increase the porosity of the rock

surrounding the site of the project. The rock pores, which originally contained fine solid particles, will become filled with water molecules. After seepage pumping stops due to closure of the repository, the storage chamber will fill with seepage water up to a pressure of about 60 atmospheres. As the hydraulic pressure inside the repository rises, the water molecules trapped in the rock pores will enable outward ion transport through the rock via a process known as ion diffusion.

Dr. Rhodes further states that there is no practical engineered waste container and sealing system, except complete immersion in tar or a similar liquid hydrocarbon, which will withstand the 60 atmosphere hydraulic pressure. Voids in nuclear waste containers will collapse and water-soluble nuclear waste components will dissolve into the water inside the storage chamber. Ontario Power Generation is relying entirely on the quality of the surrounding rock and on the storage chamber shaft seal to prevent the water-soluble radioactive ions from diffusing from the storage chamber into external ground water. However, that rock quality will be compromised by years of seepage.

Furthermore, in the Bruce project description, Ontario Power Generation failed to provide any seepage rate measurements or diffusion rate measurements through representative rock at the same hydraulic pressure gradient and hydraulic pressure as will pertain to the proposed project.

On a final note, the input from the Ministry of Natural Resources of July 23, 2013 continues to reinforce the concern about the movement of radionuclides from the site. The Joint Review Panel asked for final input from various Ministries in preparation for the Hearing of September 16, 2013. The response from the Ministry of Natural Resources cautioned that their department continues with a "view that the Salina A1 Upper Carbonate unit and the Guelph Cambrian/Shadow Lake Formations are thin, permeable layers that represent potential pathways for

relatively rapid horizontal advective radionuclide transport away from the repository site." In addition, they requested that OPG "consider a more appropriate conceptual model of solute transport at the Bruce site that would feature a more representative geological environment." Unfortunately, the response to these concerns did not move Ontario Power Generation "to perform any additional investigations related to a potential permeable basal unit in the Shadow Lake formation beyond the updip limit of Cambrian."

The economic efficiencies of this location cannot and should not trump the geological appropriateness of the site.

Local Issues That Need To Be Addressed

Our community of Inverhuron was not included in the Public Attitude Study that was done in November 2009 for AECOM regarding the socio-technical aspects of this project that will impact the local and regional area by the building of the low and intermediate level waste repository. In addition, most of our ratepayers, consisting of approximately 2,000 family members, were not present, nor contacted, during the Kincardine telephone poll done in January and February 2005. We did not elect to be a "willing host community".

We are, however, the closest community to the site of the proposed repository as our residents live just outside the southern gate of the Bruce Nuclear Plant, skirting Inverhuron Bay for approximately four and a half kilometres to the next community of Mystic Cove. As such, we feel an obligation to respond to the local issues that will effect the residents of Inverhuron.

Partially due to the exclusion of our community from the Public Attitude Study and also from the telephone poll conducted in Kincardine, along with the fact that

many of our residents are seasonal, we have been uninformed until lately about this project.

This is not to say that our residents are not committed to the Inverhuron Community. Many of us have been living here for five, six and seven generations. Inverhuron is fundamental to growing up and developing lifelong friendships – we are vested in this community and the wellbeing of Lake Huron.

Over the last year, we have been following the activities of the Joint Review Panel with great diligence and interest, reading the posted material on the Canadian Environmental Assessment Agency website for this project. In addition, The Inverhuron Committee submitted a document of concerns to the Joint Review Panel, and several of our residents have sent their own submissions to the Panel because of the danger that this project brings.

The Hardy Stevenson Peer Review

We were also extremely interested to read the Hardy Stevenson Peer Review document of October 2012, which examined Ontario Power Generation's document entitled Socio-Economic Environmental Technical Support Document (TSD).

Our reactions to the review done by the Hardy Stevenson group were twofold; we agree with the comment that the Inverhuron community should have been included in the consultation (see page 48, Section 5.1.1.1 Field Studies), and, note that the request of a referendum on this issue (see page 50, Section 5.3 DGR Hosting Agreement) appears to have gone unanswered.

Both of these appeared to us as germane to fully engaging the ratepayers within the boundaries of the municipality.

Further analysis of the Hardy Stevenson document left us with similar concerns to those raised in the final report. If answered, the responses were not communicated to the public by Ontario Power Generation nor by the Municipality.

Below are six locally oriented issues which we would like to table at this time.

1) Page 20 – Section 10 of Socio-Economic Follow-Up

   One residual effect (noise affecting enjoyment of property), was listed in the conclusions of the Socio-Economic Environment TSD. This needs to be listed and addressed. We would like to see a list of the mitigation measures proposed to address the noise, increased heavy truck traffic and decreased enjoyment of property. Furthermore, public attitude research alone is not an effective follow-up measure. It is only a small part of the monitoring process.

   Moreover, Section 10 states that *"at a minimum, the research will be undertaken once the site preparation and construction phase is complete and subsequent to any accidents or malfunctions of the DGR or associated operations, resulting in a release of radioactive contamination to the environment. This is wholly inadequate. There should be no radioactive releases to the public or the environment. If so, the DGR has bigger problems than public relations."*

   Comment

   We could not agree more with the comments of David Hardy! We cannot allow human assets to be collateral damage for the sake of an out-of-sight, out-of-mind solution to radioactive waste that still carries unmitigated danger!

2) Page 30 – Section 4: Selection of Valued Ecosystem Component's (VEC's) (regarding sustainability)

"*Approach to Evaluation*

Communities have also adopted sustainability 'analysis tools' that assist them to examine proposed new developments through a sustainability lens. These tools could be applied to assist with the assessment of the DGR. Using this tool as part of the Socio-Economic Environment Technical Support Document (TSD) would have helped to determine whether the DGR supports or detracts from valued community characteristics as specifically defined by the community. Instead, the Socio-Economic TSD (page 244, Section 8.5.3.3) relies on Public Attitude Research to identify valued community characteristics and indicators of community satisfaction. The analysis could have instead acknowledged the community vision, identified how each community articulates their own goals consistent with the vision."

Comment

Using a sustainability model would have engaged the wider population and allowed for discussion. Instead, the Public Attitude Research engaged only 809 people, of whom 43% worked in the nuclear industry. For this reason, these results are invalid.

In the Fall of 2011, the Municipality entered into a sustainability visioning process. They sought volunteers from the community. I volunteered to participate in this exercise in order to be able to understand where Kincardine was headed in the future. I attended all meetings but one and the DGR was never mentioned nor "assessed to see the fit between the goals and potential changes due to the DGR" (page 30, Section 4 of the Hardy Stevenson Peer Review). In April 2012, the Sustainability Plan was

released and approved by Council with three sentences on page 16 referring to the DGR. The entire report was 59 pages in length.

3) Page 161, Section 6.2.2.1 Changes in Air Quality

"During the site preparation and construction, operations and decommissioning phases, various activities and operations may result in changes in air quality. There is a need to be more specific with interactions with VECs. For example, under 'physical assets' VECs in Table 6.2.2-1, we would have expected more analysis of how diminished air quality would affect the community character."

Comment

We are awaiting follow up on this issue, particularly, relative to health issues such as asthma, chronic obstructive pulmonary disease and other respiratory illnesses.

4) Page 168, Table 6.2.2-5 Summary of Potential Interactions between Changes in Ground water Quality and Socio-Economic Environment VECs

"Ground water quality appears to have the potential to affect off-site residential potable water. If this is true, the interaction needs further discussion since all ground water quality and flow issues should be able to be managed on site."

Comment

Eventually, our ground water flows into Lake Huron and the Great Lakes Basin which provides the drinking water to 40 million Canadian and American citizens. This issue of contaminated water has dire consequences.

5) Page 178, Section 7.2.2 Indirect Changes

Section 7.2.2 describes other measurable changes (indirect) in the socio-economic environment during the site preparation and construction phase of the DGR project that may be associated with measureable changes in natural assets. There is mention that there will be indirect changes to property value as a result of the project. This needs to be discussed in greater detail to determine how, where and why these changes will occur. If changes are negative, a discussion of how to maintain property values would be appropriate.

Comment

The Property Value Protection Plan is only to be discussed after licensing. This does not give the project a complete framework and leaves residents to negotiate after the fact.

In examining other Property Value Protection Plans, it would appear that it is the project proponent who has the final say as to compensation AND this is only done if the property owner can prove some form of contamination of their water or soil. Stigma must be an integral part of a plan to compensate local residents.

6) Page 203, Section 8.3.1.1 Likely Effects (population and demographics)

In the report done by the Hardy Stevenson group, it is stated that, *"There is an expectation of some outmigration of people due to the location of the DGR and replacement of people who would be more tolerant of the DGR. While this may or may not occur, it could hardly be considered to be a beneficial effect. If it does occur, it should be brought forward as a residual effect. Thus, instead of outmigration being an effect where no mitigation measures are warranted, a strong communications program could be a*

follow-up mitigation measure to encourage people to stay in the community."

Comment

Many of the residents of this community are founding families from the mid 1800s and early 1900s. The psychological damage to our generation and those who follow is unthinkable.

We have listed above six socio-economic factors from the Hardy Stevenson Peer Review that gravely concern our community and, without having been engaged as part of the discussion between local residents and Ontario Power Generation and the Municipality of Kincardine, these concerns, along with others, remain reasons why this proposed DGR should not go forward.

To conclude this section of our presentation, I would like to add some less formal data. Our Inverhuron Committee surveyed the residents of Inverhuron in the Fall of 2012, using contact information on email and 86% of those who replied indicated that they were NOT in favour of the deep geologic repository. Interestingly enough, the Kincardine Independent newspaper conducted a survey the week of June 19, 2013 asking whether readers were in favour of the repository or not and 86% replied "not in favour". These results may be as valid as a telephone poll done in the middle of winter and certainly do not show the overwhelming support of a "willing host".

CONCLUSION

The Inverhuron Committee has through research, discussion, and analysis concluded that this project is not good for Inverhuron, for Kincardine, for Ontario, for Canada nor for the United States.

We oppose this project, and strongly recommend that the Joint Review Panel deny the licensing of this project.
