Application of the Contribution to Sustainability Test in Ontario Power Generation's Alternative Means Risk Analysis and Environmental Impact Statement

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1. Introduction

This document responds to the Joint Review Panel's (JRP) inquiry into how a sustainability-based decision framework should be applied in the Alternative Means Risk Analysis (AMRA) and, more broadly, the Environmental Impact Statement (EIS) for the proposed Deep Geologic Repository (DGR) project – in order to fulfill the "contribution to sustainability test".

The contribution to sustainability test carries requirements for the proponent of the DGR project as well as the JRP. In the Sections that follow, I provide a brief explanation of these obligations, beginning with those for the proponent, Ontario Power Generation (OPG).

2. Obligations of the "Contribution to Sustainability Test" for Ontario Power Generation

Today, sustainability-based assessment is required in many jurisdictions around the world (see Dalal-Clayton & Sadler, 2014). Indeed, there is now a rich body of literature that explains how sustainability-based assessment should be undertaken (see Lawrence, 1997; George, 1999; Gibson, 2000; Pope et al., 2005; Gibson, 2006; Pope, 2006; Partaderio et al., 2009). In the paragraphs that follow, I describe how OPG should have addressed sustainability concerns in the AMRA and the EIS more broadly.

Step #1: With respect to the AMRA and the EIS, OPG should have at the outset of decision making laid out a comprehensive suite of generic sustainability criteria to guide the analyses. Gibson et al. (2005) have developed a set of generic sustainability criteria that have been internationally recognized and applied in Canada (see Gibson et al., 2008). To be comprehensive, the criteria should devote attention to (a) the maintenance and enhancement of ecological system integrity, (b) livelihood sufficiency, (c) social equity, (d) collaborative decision-making, and (e) natural resource systems. They should also cover a concern for decision-making that fosters precaution, learning, and adaptation. Generic sustainability criteria can be applied in any case and context. Thus, OPG could easily adopt Gibson et al.'s criteria in the AMRA and the EIS more broadly. Please see Appendix A for Gibson et al.'s generic sustainability decision criteria.

Step #2: The next step should be to specify the generic sustainability criteria with the particular considerations surrounding selection among options for best management of low- and intermediate-level radioactive wastes. For example, in the AMRA, the Independent Expert Group (IEG) used various "Pathways of Harm" to frame the risk analysis. These pathways of harm could be used in this specification step because they represent some of the particular considerations associated with the task of choosing the best option for dealing with low- and intermediate-level radioactive wastes. Essentially, this specification step ensures that the generic criteria cover all of the real-life, context-specific concerns related to nuclear waste management. See Appendix B for an illustration of how Gibson et al.'s generic criteria should be specified with the pathways of harm used in the AMRA.

Step #3: The comparative analysis of options in the AMRA and EIS should proceed on the basis of the specified sustainability decision criteria. The public should have a clear understanding of how each option would perform relative to each sustainability criteria and pathway of harm. And the evaluation should be transparent in order to allow the public to critique it. In the AMRA,

each option should be fairly evaluated in terms of how it would perform against the specified criteria, considering multiple scales of impacts and synergistic and cumulative effects. This approach is compatible with the "probability and consequences" method adopted in the AMRA in that the evaluation for each option would relate back to the probability and consequences as well as the sustainability decision criteria.

In this way, sustainability decision criteria should structure the analyses in the AMRA and EIS. By extension, the findings of the analyses should clearly relate back to sustainability matters. The results should thus help OPG, the JRP and the Public select the option that contributes the greatest net positive contributions to sustainability. The contribution to sustainability test obligates us to ensure that sustainability concerns are considered throughout decision making – as opposed to *after* analyses have been performed and decisions have been made. This represents a proactive approach to incorporating sustainability matters into decision-making as opposed to a retrospective one.

In Section 3, below, I turn to a brief description of the obligations of the contribution to sustainability test for the JRP.

3. Obligations of the "Contribution to Sustainability Test" for the Joint Review Panel

The contribution to sustainability test obliges the JRP to consider the acceptability of the proposed Project based, in part, on the extent to which the proponent has demonstrated that the Project will contribute net positive benefits over the long term, considering all risks, uncertainties, and trade-offs.

Various JRPs in Canada have shown the way with respect to how the contribution to sustainability test should be applied. Below, I describe three case examples: Kemess North Copper-Gold Mine, Whites Point Quarry and Marine Terminal, and Voisey's Bay Nickel Mine and Mill.

Case #1: Kemess North Copper-Gold Mine

In this case, the Panel decided to adopt a sustainability framework for its overall assessment of whether or not the Project is in the public interest. In determining a suitable sustainability framework, the Panel consulted various recent mining sector sustainability initiatives. In addition, the Panel considered the rationale behind the "B.C. Mining Plan", a comprehensive and recent strategic planning initiative led by the provincial government, and involving consultation with industry and other stakeholders. The Panel finally examined the Project from the following five sustainability perspectives (see Kemess North Mine Joint Review Panel, 2007, p. 257):

- **Environmental Stewardship** – Is the environment adequately protected through all phases of development, construction, and operation, as well as through the legacy post-closure phase?
- **Economic Benefits and Costs** – Does the Project provide net economic benefits to the people of British Columbia and Canada?
- **Social and Cultural Benefits and Costs** – Does the Project contribute to community and

social well-being of all potentially affected people? Is it compatible with their cultural interests and aspirations?
- **Fair Distribution of Benefits and Costs** – Are the benefits and costs of development fairly distributed among potentially affected people and interests?
- **Present versus Future Generations** – Does the Project succeed in providing economic and social benefits now without compromising the ability of future generations to benefit from the environment and natural resources in the minesite area?

Based on an analysis of the pros and cons of Project development, evaluated individually for each of these five sustainability perspectives, and then in combination, the Panel concluded that overall, from a public interest perspective, the benefits of the Project development would not outweigh the costs. Thus, the Panel recommended to the federal and provincial Ministers of the Environment that the Project not be approved, as proposed (see Kemess North Mine Joint Review Panel, 2007, p. xxiv).

Case #2: Whites Point Quarry and Marine Terminal

Similar to the Kemess North case, the JRP created a sustainability framework to evaluate the project's contribution to sustainability. The Panel found guidance in key policy documents adopted by federal, provincial and local governments and development agencies. The Panel finally evaluated the Project's contribution to sustainability on the basis of

- The extent to which the Project makes a positive overall contribution towards the attainment of ecological and community sustainability, at both the local and regional levels;
- The effort made to enhance positive effects of the Project on the physical, biological and human environment, as well as mitigation of adverse effects;
- How the planning, design and operation of the Project will strengthen local and regional capacities and opportunities to achieve a sustainable future;
- How monitoring, management and reporting systems will attempt to ensure continuous progress towards sustainability; and
- Appropriate indicators to determine whether this progress is being maintained (see Whites Point Quarry and Marine Terminal Project Joint Review Panel, 2007, p. 101).

Using this framework the Panel evaluated all aspects of the proposed Project. The Panel determined that the Proponent did not adequately consider sustainability in preparing and presenting its information. Finally, the Panel recommended that the Minister of Environment (Canada) and Labour (Nova Scotia) reject the proposal on the basis that the Project would likely cause significant adverse environmental effects that, in the opinion of the Panel, could not be justified (Whites Point Quarry and Marine Terminal Project Joint Review Panel, 2007, p. 101).

Case #3: Voisey's Bay Nickel Mine and Mill

In this case, the Panel stated that progress towards sustainability would require the following:

- the preservation of ecosystem integrity, including the capability of natural systems to maintain their structure and functions and to support biological diversity;

- respect for the right of future generations to the sustainable use of renewable resources; and,
- the attainment of durable and equitable social and economic benefits (see Voisey's Bay Mine and Mill Environmental Assessment Panel, 1997, Section 3.3 Sustainability Assurance).

Furthermore, the Panel clarified that, in reviewing the EIS and other submissions, it would consider:

- the extent to which the Undertaking may make a positive overall contribution towards the attainment of ecological and community sustainability, both at the local and regional levels;
- how the planning and design of the Undertaking have addressed the three objectives of sustainable development stated above;
- how monitoring, management and reporting systems will attempt to ensure continuous progress towards sustainability; and,
- appropriate indicators to determine whether this progress is being maintained (Voisey's Bay Mine and Mill Environmental Assessment Panel, 1997, Section 3.3 Sustainability Assurance).

On this basis, the Panel set out a range of substantive conditions for approval. These included, among others, impact and benefit agreements between the Proponent and key affected communities, and an environmental co-management agreement, which established a joint body to monitor project effects, review new and to-be specified project-related actions, and recommend necessary adjustments (see Gibson, 2006).

4. Conclusion

It is CELA's position that the contribution to sustainability test obliges OPG and the IEG to incorporate sustainability matters throughout decision making and analysis. The AMRA and the EIS should clearly demonstrate how sustainability decision criteria structured decision making and analysis in a proactive way.

Similarly, the sustainability test compels the JRP to evaluate the AMRA and EIS using a sustainability framework. The examples provided in Section 2, above, give the JRP for the proposed DGR Project a sense of how other Panels have approached this task as well as how previous decisions about acceptability were influenced by sustainability considerations.

Please see the Appendices for further illustration of how OPG should apply sustainability considerations in the AMRA and EIS.

References

Dalal-Clayton, B., & Sadler, B. (2014). *Sustainability Appraisal: A Sourcebook and Reference guide to International Experience.* New York: Routledge.

George, C. (1999). Testing for sustainable development through environmental assessment. *Environmental Impact Assessment Review, 19*, 175-200.

Gibson, R.B. (2000). Favouring the higher test: Contribution to sustainability as the central criterion for reviews and decisions under the *Canadian Environmental Assessment Act*. *Journal of Environmental Law and Practice, 10*(1), 39-54.

Gibson, R.B., Hassan, S., Holtz, S., Tansey, J., & Whitelaw, G. (2005). *Sustainability Assessment: Criteria and Processes*. Sterling, VA: Earthscan.

Gibson, R.B. (2006). Sustainability assessment and conflict resolution: Reaching agreement to proceed with the Voisey's Bay nickel mine. *Journal of Cleaner Production, 14*, 334-348.

Gibson, R.B. (2006). Sustainability assessment: Basic components of a practical approach. *Impact Assessment and Project Appraisal, 24*(3), 170-182.

Gibson, R.B., Winfield, M., Markvart, T., Gaudreau, K., & Taylor, J. (2008). *An Analysis of the Ontario Power Authority's Consideration of Environmental Sustainability in Electricity System Planning.* Green Energy Coalition.

Kemess North Mine Joint Review Panel. (2007). *Kemess North Copper-Gold Mine Project Joint Review Panel Report*. Her Majesty the Queen in Right of Canada.

Lawrence, D.P. (1997). Integrating sustainability and environmental impact assessment. *Environmental Management, 21*(1), 23-42.

Partidario, M.R., Sheate, W.R., Bina, O., Byron, H., & Augusto, B. (2009). Sustainability assessment for agriculture scenarios in mountain areas: Lessons from sex study areas. *Environmental Management, 43,* 144-165.

Pope, J. (2006). What's so special about sustainability assessment? *Journal of Environmental Assessment Policy and Management, 8*(3), v-x.

Pope, J., Morrison-Saunders, A., & Annandale, D. (2005). Applying sustainability assessment models. *Impact Assessment and Project Appraisal, 23*(4), 293-302.

Voisey's Bay Mine and Mill Environmental Assessment Panel. (1997). *Environmental Impact Assessment Guidelines for the Review of the Voisey's Bay Mine and Mill Undertaking.* Canadian Environmental Assessment Agency.

Whites Point Quarry and Marine Terminal Project Joint Review Panel. (2007). *Environmental Assessment of the Whites Point Quarry and Marine Terminal Project: Joint Review Panel Report.* Her Majesty the Queen in Right of Canada.

Appendix A: Generic Sustainability Decision Criteria

Generic Sustainability Decision Criteria Developed by Gibson et al. (2005)

1. Socio-ecological system integrity: Build human-ecological relations to establish and maintain the long-term integrity of socio-biophysical systems and protect the irreplaceable life support functions upon which human as well as ecological well-being depends.

2. Livelihood sufficiency and opportunity: Ensure that everyone and every community has enough for a decent life and that everyone has opportunities to seek improvements in ways that do not compromise future generations' possibilities for sufficiency and opportunity.

3. Intragenerational equity: Ensure that sufficiency and effective choices for all are pursued in ways that reduce dangerous gaps in sufficiency and opportunity (and health, security, social recognition, political influence, etc.) between the rich and the poor.

4. Intergenerational equity: Favour present options and actions that are most likely to preserve or enhance the opportunities and capabilities of future generations to live sustainably.

5. Resource maintenance and efficiency: Provide a larger base for ensuring sustainable livelihoods for all while reducing threats to the long-term integrity of socio-ecological systems by reducing extractive damage, avoiding waste and cutting overall material and energy use per unit of benefit.

6. Socio-ecological civility and democratic governance: Build the capacity, motivation and habitual inclination of individuals, communities and other collective decision making bodies to apply sustainability requirements through more open and better informed deliberations, greater attention to fostering trust, reciprocal awareness and collective responsibility, and more integrated use of administrative, market, customary and personal decision making practices.

7. Precaution, adaptation, and innovation: Respect uncertainty, avoid even poorly understood risks of serious or irreversible damage to the foundations for sustainability, plan to learn, design for surprise and manage for adaptation.

8. Immediate and long-term integration: Apply all principles of sustainability at once, seeking mutually supportive benefits and multiple gains.

NOTE: Because these criteria are generic, they can be applied in any case and context. Thus, OPG could adopt these criteria and/or refer to them to ensure that their criteria address a comprehensive suite of sustainability concerns.

Appendix B: Application of Specified Sustainability Decision Criteria

Here, I illustrate how Gibson's generic sustainability decision criteria should be specified with the particular considerations surrounding selection among options for best management of low- and intermediate-level radioactive wastes. I use the Pathways of Harm set out in the AMRA because they represent some of these particular considerations. The analysis of the four options described in the AMRA should proceed on the basis of this specified sustainability framework. In other words, the JRP and the public should be able to understand and evaluate how OPG and the IEG considered each option against these specified criteria.

1. **Socio-ecological system integrity:**
    - Transport of radionuclides (advective water flow)
        - How would the transport of radionuclides influence the extent to which the proposed option would contribute to this sustainability criterion?
        - Ask other questions related to all of the specifics set out in Table 1 in the AMRA
    - Transport of radionuclides (advective gas flow)
        - How would the transport of radionuclides influence the extent to which the proposed option would contribute to this sustainability criterion?
        - Ask other questions related to all of the specifics set out in Table 1 in the AMRA
    - Seismic impairment
        - How would a seismic event that leads to structural damage influence the extent to which the proposed option would contribute to this sustainability criterion?
        - Ask other questions related to all of the specifics set out in Table 1 in the AMRA
    - Structural and mechanical impairments
        - Ask questions related to all of the specifics set out in Table 1 in the AMRA
    - Waste container integrity
        - Ask questions related to all of the specifics set out in Table 1 in the AMRA
    - Radiological exposure during transportation accidents
        - Ask questions related to all of the specifics set out in Table 1 in the AMRA
    - Severe weather
        - Ask questions related to all of the specifics set out in Table 1 in the AMRA
    - Glaciation
        - Ask questions related to all of the specifics set out in Table 1 in the AMRA
    - Malevolent acts
        - Ask questions related to all of the specifics set out in Table 1 in the AMRA
    - Loss of institutional control
        - Ask questions related to all of the specifics set out in Table 1 in the AMR

2. **Livelihood sufficiency and opportunity:**
    - Worker health and safety
    - Public health and safety
    - Transport of radionuclides (advective water flow)
    - Transport of radionuclides (advective gas flow)
    - Seismic impairment
    - Structural and mechanical impairments

- Waste container integrity
- Radiological exposure during transportation accidents
- Severe weather
- Glaciation
- Malevolent acts
- Loss of institutional control

3. Intragenerational equity:

- Worker health and safety
- Public health and safety
- Transport of radionuclides (advective water flow)
- Transport of radionuclides (advective gas flow)
- Seismic impairment
- Structural and mechanical impairments
- Waste container integrity
- Radiological exposure during transportation accidents
- Severe weather
- Glaciation
- Malevolent acts
- Loss of institutional control

4. Intergenerational equity:

- Worker health and safety
- Public health and safety
- Transport of radionuclides (advective water flow)
- Transport of radionuclides (advective gas flow)
- Seismic impairment
- Structural and mechanical impairments
- Waste container integrity
- Radiological exposure during transportation accidents
- Severe weather
- Glaciation
- Malevolent acts
- Loss of institutional control

5. Resource maintenance and efficiency:

- Transport of radionuclides (advective water flow)
- Transport of radionuclides (advective gas flow)
- Seismic impairment
- Structural and mechanical impairments
- Waste container integrity
- Radiological exposure during transportation accidents
- Severe weather
- Glaciation

- Malevolent acts
- Loss of institutional control

6. Socio-ecological civility and democratic governance:

- Worker health and safety
- Public health and safety
- Transport of radionuclides (advective water flow)
- Transport of radionuclides (advective gas flow)
- Seismic impairment
- Structural and mechanical impairments
- Waste container integrity
- Radiological exposure during transportation accidents
- Severe weather
- Glaciation
- Malevolent acts
- Loss of institutional control

7. Precaution, adaptation, and innovation:

- Worker health and safety
- Public health and safety
- Transport of radionuclides (advective water flow)
- Transport of radionuclides (advective gas flow)
- Seismic impairment
- Structural and mechanical impairments
- Waste container integrity
- Radiological exposure during transportation accidents
- Severe weather
- Glaciation
- Malevolent acts
- Loss of institutional control

8. Immediate and long-term integration:

- Worker health and safety
- Public health and safety
- Transport of radionuclides (advective water flow)
- Transport of radionuclides (advective gas flow)
- Seismic impairment
- Structural and mechanical impairments
- Waste container integrity
- Radiological exposure during transportation accidents
- Severe weather
- Glaciation
- Malevolent acts
- Loss of institutional control