PMD 13-P1.5B

File / dossier : 8.01.07
Date: 2013-08-27
Edocs: 4191224

Supplementary Information

Presentation from Environment Canada

On Aquatic : Surface Water

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

This submission contains confidential information and is not publicly available.

Renseignements supplémentaires

Présentation de Environnement Canada

Sur Le milieu Aquatique : Eaux de surface

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

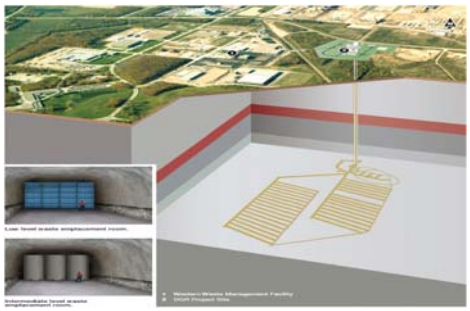
Ce mémoire contient des renseignements confidentiels et n'est pas accessible au public.

Canada

Environment Canada Environnement Canada

Canada

Deep Geologic Repository Public Hearings



Environment Canada Presentation to Joint Review Panel on Aquatic /Surface Water Issues

October 1, 2013

Presentation Outline

- Environment Canada (EC) role in the Environmental Assessment (EA) process
- EC mandate on surface water issues
- Focus of EC review
- EC submission to Joint Review Panel (JRP)
  - Key issues & recommendations on surface water issues

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EC Role in the EA Process

- EC is a Federal Authority under the *Canadian Environmental Assessment Act* (CEAA) for this Project
- At JRP's request, EC has actively participated in Environmental Impact Statement (EIS) review
- EC submitted proposed Information Requests (IRs) to JRP during EIS review
- EC reviewed Ontario Power Generation (OPG) responses to these IRs and advised the JRP on their adequacy
- At JRP's request, EC provided written submission to the JRP as a Government Participant on July 23, 2013

Environment Canada's Mandate

- EC's mandate determined by statutes and regulations assigned by Parliament through the Minister of the Environment
- Also shaped by policies, guidelines, codes of practice, inter-jurisdictional and international agreements, various programs
- Key Legislation/Policies related to surface water issues that may apply to the DGR Project:
  - *Department of Environment Act*
  - *Fisheries Act*
  - *Canadian Environmental Protection Act, 1999*
  - *Great Lakes Water Quality Protocol of 2012*
  - Federal Policy on Wetlands Conservation

Fisheries Act (1)

- EC has administrative responsibility for the pollution prevention provisions under Subsection 36(3) of the *Fisheries Act* (through Prime Ministerial Order)
  - unless authorized by federal regulation, no person shall deposit or permit the deposit of deleterious substances of any type in water frequented by fish,
  - no deposit of a deleterious substance in any other place where it may enter such waters
- Any substance with a potentially harmful chemical, physical or biological effect on fish or fish habitat is considered deleterious
  - e.g. suspended solids, salinity, metals
- Effluent toxicity tests often used to demonstrate if deleterious
- No dilution or mixing zone allowed at point of discharge

Fisheries Act (2)

- **Direct relevance to DGR:** Proponent must ensure that effluent/discharges are in compliance with subsection 36 (3), in particular:
  - Contaminants from various Project-related sources
  - Accidental spills
  - Possible migration of contaminants via groundwater to surface water

EC Review Focus Topics (1)

- EC review focused on surface water issues related to:
  - surface water quality (which also includes potential contamination from shallow groundwater inputs)
  - water quantity (which also includes potential effects of shallow groundwater upon surface water levels and flows)
  - effects of the environment on the Project
  - accidents and malfunctions

EC Review Focus Topics (2)

- EC's review of the DGR Project focused on potential effects of the Project upon the surface environment
- EC's review of potential effects is based on OPG's modelling of contaminant concentrations in the surface environment
- The assessment of the migration of contaminants out of the Repository during the Abandonment and Long-term Performance Phase was reviewed by CNSC

EC Conclusions /Recommendations (1)

Surface Water Quality

- **Key issues:**
  - Groundwater pumped from vault contains very high levels of salinity
  - Waste rock storage pile has potential to leach salinity and metals
  - High TSS levels from various sources
  - Proposed stormwater management pond (SWMP) not adequately designed to treat the contamination from these various sources
  - SWMP effluent unlikely to meet *Fisheries Act* sec. 36, based on current SWMP design
- **Main Recommendations:**
  - Design SWMP to meet *Fisheries Act* during all phases of project
    - Options for treatment for salinity is a primary consideration
  - Design treatment system based on water quality estimates derived from:
    - Geochemical testing of rock
    - Monitoring of water (groundwater, process water) pumped from underground
    - Leachate monitoring
    - Hydrological modelling (retention of large storm events)

EC Conclusions /Recommendations (2)

Water Quantity – Water Levels and Flows

- **Key issues:**
  - Assessing potential effects of Project to surface water levels and flows:
    - EC opinion that changes in groundwater levels are unlikely or minimal, and minor changes to site watershed will not have an effect upon:
      - Adjacent wetland (Wetland 4)
      - Nearby high-quality stream (Stream C)
- **Main Recommendations:**
  - Adjacent wetland (Wetland 4):
    - Verify overburden stratigraphy during construction; undertake mitigation if warranted.
    - Monthly monitoring of water levels in Wetland 4
    - Report groundwater inflows into the shafts/Repository
  - Stream C:
    - Flow monitoring in North Railway Ditch that leads to Stream C

EC Conclusions /Recommendations (3)

Water Quantity - Effects of the Environment on the Project

- **Key issues:**
  - Maximum Flood Hazard Assessment (potential flooding of Repository during construction/operation)
- **Main Recommendations:**
  - OPG to conduct a revised flood modelling hazard assessment based on:
    - final design/layout
    - Probable Maximum Precipitation event that accounts for potential effects of climate change (e.g. intensity and duration of event)
    - conduct a sensitivity analysis on the model
  - OPG to adjust design of facility, such as shaft collar heights, according to results of revised flood hazard assessment to protect Repository from flooding during extreme precipitation event

EC Conclusions /Recommendations (4)

Water - Accidents/Malfunctions

- **Key issues:**
  - Potential spills may impact surface water quality:
    - Underground spills within Repository
    - Spills within DGR site at surface
    - Spills along roadway over railway ditches (which lead to Stream C)
- **Main Recommendations:**
  - Proponent develops a detailed spill response plan:
    - Containment methods, locations and strategies to achieve containment
    - Demonstrate deployment time will prevent downstream effects

Summary of EC Position

- A key issue identified by EC relates to the quality of effluent discharged by the Project
- EC is of opinion that, within the context of our mandate and review (surface environment), and with the acceptance of our recommendations by the JRP, the Project would not cause significant adverse effects to surface water that cannot be mitigated
- EC also makes a number of recommendations regarding the verification of predicted effects, the design of Follow-Up and Monitoring Programs, updated modelling studies, and spill response planning