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January 8, 2010

File No: NK054-00531 P  
CD No: NK054-CORR-00531-00058

Mr. Alan R. Graham  
Chair, Darlington New Nuclear  
Joint Review Panel

c/o Canadian Nuclear Safety Commission  
280 Slater Street  
Ottawa, ON K1P5S9

Dear Mr. Chair:

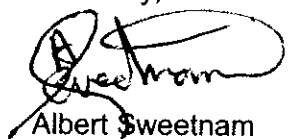
**OPG Response to Joint Review Panel Information Request December 15, 2009**

- References:
1. JRP letter, JRP Chair to A. Sweetnam, "Information Request on the Review of Environmental Impact Statement and Application for a Licence to Prepare a Site for New Nuclear at Darlington", December 15, 2009, CD# NK054-CORR-00531-00054.
  2. OPG letter, A. Sweetnam to JRP Chair, "Response to Joint Review Panel Information Request December 15, 2009", December 18, 2009, CD# NK054-CORR-00531-00056.

The purpose of this letter is to respond to the Information Request (IR) from the Joint Review Panel as provided in Reference 1. The detailed response attached satisfies the commitment made in Reference 2.

No new commitments are made in this letter. If you have any questions, please contact Ms. Laurie Swami, Director of Licensing and Environment, Darlington New Nuclear Project, at 905-837-4540, extension 5203.

Sincerely,



Albert Sweetnam  
Executive Vice President  
Darlington New Nuclear Project  
Ontario Power Generation

Att

- Cc. Ms. J. Beaudet, JRP Member  
Mr. J. K. Pereira, JRP Member  
Ms. K. McGee, JRP Co-Manager - CNSC (Ottawa)  
Ms. D. Myles, JRP Co-manager – CEAA (Ottawa)

## **ATTACHMENT**

Attachment to OPG letter, Albert Sweetnam to JRP Chair," OPG Response to Joint Review  
Panel Information Request December 15, 2009"

January 8, 2010

CD# NK054-CORR-00531-00058

OPG Response to Joint Review Panel Information Request December 15, 2009

JRP IR#	EIS Guideline Section <sup>1</sup> LTPS Section and/or TSD	Detailed Information Request and Response
1	5.5 International Agreements  10.1.2 Surface Water  1.3 SEAETSD <sup>2</sup>	<p><b>Environment Canada IR:</b> Provide information necessary for the determination on the potential for the Project to result in a change in the natural level of Lake Ontario at the International Boundary and/or the outflow from lake Ontario into the St. Lawrence River</p> <p><b>Rationale:</b> As reported in the EIS, the Cooling Tower option would make a net withdrawal of 4.5 cubic meters per second (equivalent to 4,500 liters/second or 388.8 million liters per day) of water from Lake Ontario. This water would evaporate and not be returned directly to the lake. This option has the potential to impact transboundary water levels, specifically the water levels of Lake Ontario. As such, it may require approval from the Department of Foreign Affairs and International Trade (DFAIT) Canada under the International Boundary Waters Treaty Act, 2002 (IBWTA) and its regulations. The EIS and supporting documents do not adequately evaluate the implications of the proposed project on the water level of Lake Ontario. Page 1 – 5 of the SWAETSD states that there will be “no anticipated effect due to the project” on Lake Ontario water levels, but does not provide any detail on the analysis conducted or the rationale used to arrive at this conclusion. An analysis could consider lake surface area and volume and the Project’s consumptive use to estimate the impact on water level. The analysis should also include any other net water withdrawals arising from the Project.</p> <p><b>OPG Response, (January 8, 2010):</b> The Environmental Impact Statement (EIS) acknowledged that the cooling tower option would result in a withdrawal of lake water (4.5 m<sup>3</sup>/s). This small withdrawal has no effect on the natural level of Lake Ontario at the International Boundary or Lake Ontario discharges into the St. Lawrence River. The water levels are maintained through regulated control structures (Moses-Saunders power dam) and continuous input and output of large volumes of water. Details of the analysis and information where the data can be found in the Environmental Assessment are summarized below. As presented on page 13-6 (Section 13.2.2) of the EIS, net water withdrawals from Lake Ontario were a consideration in OPG’s determination of a preference for once-through lake water cooling.</p> <p><b>Detailed Response:</b> As described on page 4-6 (Section 4.2.1) of the Surface Water Environment (SWE) Assessment of Environmental Effects Technical Support Document (TSD), the cooling tower option would result in a maximum net withdrawal of lake water of approximately 4.5 m<sup>3</sup>/s. Other operational and process requirements (e.g., steam discharges, treatment plant wastes) would increase the maximum net water withdrawals to approximately 4.6 m<sup>3</sup>/s, as described on page 4-37 (Section 4.5.2.1) of the Scope of Project for EA Purposes TSD.</p>

<sup>1</sup> A single IR may reference more than one EIS Guideline Section. When an IR related to more than one EIS Guideline Section each EIS Guideline Section will be referenced in numerical order in a single EIS Guideline Section box.

<sup>2</sup> SWAETSD = Surface Water Environmental Assessment of Environmental Effects Technical Support Document

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		<p>Although water levels in Lake Ontario are influenced by a number of natural and anthropogenic factors, they are principally regulated through elevation control structures near to, and at, the Moses-Saunders power dam near Cornwall, Ontario and Massena, New York. These control structures generally regulate Lake Ontario water levels within a target range of 74.2 to 75.4 m above mean sea level (International St. Lawrence River Board of Control, 2009). The natural variability of hydrological inputs (such as tributaries, precipitation, runoff) to Lake Ontario mean that resultant water levels can be adequately controlled, to balance the needs for navigation and power production with the protection of shoreline property.</p> <p>With respect to Lake Ontario natural levels, as indicated on page 4-1 (Section 4.1.1) of SWE Existing Environmental Conditions TSD, Lake Ontario's long-term average volume and surface area equate to approximately <math>1.64 \times 10^{12} \text{ m}^3</math> and <math>1.896 \times 10^{10} \text{ m}^2</math>, respectively. Assuming a static system (i.e., not accounting for continuous hydrological inputs and outputs to, and from, Lake Ontario), net project withdrawals (<math>4.6 \text{ m}^3/\text{s}</math>) from Lake Ontario would result in an approximate lake water level decrease of 7.7 mm per year. This decrease would not occur under actual conditions since it does not account for hydrological inputs and outputs to the system, nor the regulating effects of elevation control structures.</p> <p>The long-term hydrological inputs to Lake Ontario average approximately <math>7,400 \text{ m}^3/\text{s}</math>. Long-term evaporation rates for the lake average approximately <math>500 \text{ m}^3/\text{s}</math>. Long term outflows averaging approximately <math>6,900 \text{ m}^3/\text{s}</math> are discharged from Lake Ontario to the St. Lawrence River. A comparison of net project withdrawals (<math>4.6 \text{ m}^3/\text{s}</math>) with the outflow to the St. Lawrence River indicates that long-term average outflows would decrease by approximately 0.07%. Considering the natural variability in outflows brought about by precipitation, evaporation, wave-overtopping, seiching, storm surges, barometric variation and/or a combination of these, net project withdrawals (<math>4.6 \text{ m}^3/\text{s}</math>) will not result in a change to Lake Ontario discharges into the St. Lawrence River.</p> <p><b>References</b>  International St. Lawrence River Board of Control (2009)  Lake Ontario St. Lawrence River Regulation, <a href="http://www.islrb.org/new-version/brochure.html">http://www.islrb.org/new-version/brochure.html</a>, downloaded December 21, 2009.</p>