1.0 PURPOSE

This evidence presents period-over-period comparisons of regulated hydroelectric production, as well as actual versus forecast comparisons for historical years. This evidence supports the approval of the regulated hydroelectric production forecast presented in Ex. E1-T1-S1.

2.0 PERIOD-OVER-PERIOD EXPLANATIONS – TEST PERIOD

As noted in Ex. E1-T1-S1, section 2.5, a forecast surplus baseload generation (“SBG”) adjustment has been included in the regulated hydroelectric production totals for the bridge year and test period to account for expected production losses associated with SBG. Surplus baseload generation became significant in Ontario in 2009 and is expected to continue during 2010, 2011, and 2012. The forecast SBG adjustment is presented on line 21 of Ex. E1-T1-S2 Table 1.

2012 Plan versus 2011 Plan

The total regulated hydroelectric production forecast for 2012 is 2 per cent (0.3 TWh) lower than the forecast for 2011 (see Ex. E1-T1-S2 Table 1). This decrease in forecast production is primarily attributable to an increase in forecast SBG in 2012 at the Sir Adam Beck plants.

Flow forecasts for the Niagara and St. Lawrence Rivers are similar (within 1 per cent) for the two years.

2011 Plan versus 2010 Budget

The total regulated hydroelectric production plan for 2011 is very similar to the production plan for 2010 (see Ex. E1-T1-S2 Table 1).

Slightly more production is forecast for the Sir Adam Beck plants (0.2 TWh) and DeCew Falls (0.1 TWh) for 2011, but this increase is offset by reductions in production due to impacts of
forecast SBG at the Beck plants in 2011. The slight increase in production forecast for the Sir
Adam Beck plants in 2011 is attributable to a marginal increase (just over 1 per cent) in
forecast Niagara River flows for 2011. Increased production at DeCew Falls for 2011 is due
to an increase in unit availability expected for DeCew Falls I during 2011. DeCew Falls I was
removed from service in December 2008 for penstock replacement and the four units are
expected to return to service between July 2010 and April 2011.

Production forecast for R.H. Saunders for 2011 is similar to 2010 (increase of less than 1 per
cent). St. Lawrence River flows forecast for 2011 are marginally higher (just over 1 per cent)
than those forecast for 2010.

3.0 PERIOD-OVER-PERIOD EXPLANATIONS – BRIDGE YEAR

2010 Budget versus 2009 Actual

The total regulated hydroelectric production forecast for 2010 is marginally lower (less than
0.1 TWh) than the actual production for 2009 (see Ex. E1-T1-S2 Table 1).

Production forecast for the Niagara Plant Group for 2010 is expected to be similar to that
achieved in 2009. A slight increase in production (about 3 per cent) is expected at DeCew
Falls in 2010 compared to 2009, due to the planned return to service of two DeCew Falls I
units during the third quarter of 2010. Production at the Sir Adam Beck plants for 2010 is
forecast to be similar to 2009.

The production plan at R.H. Saunders for 2010 is more than 2 per cent (0.2 TWh) lower than
actual production for 2009. The reduction in production for 2010 is attributable to a forecast
decrease in St. Lawrence River flows for 2010. The annual mean flow forecast for 2010 is
about 2 per cent lower than the annual mean flow for 2009.

4.0 PERIOD-OVER-PERIOD EXPLANATIONS – HISTORICAL PERIOD

OPG has included information in E1-T1-S2 Table 1 to illustrate OPG’s performance in
forecasting production for the regulated hydroelectric facilities. The table presents the
“imputed generation” for the historical years. Imputed generation is the production value
produced by running the forecast model using actual water flows as inputs (replacing the forecast flows) with all other input variables remaining the same. In essence, the imputed generation shows what the regulated hydroelectric production forecast would have been if the water flows for a given year were known in advance. Imputed generation values are shown at lines 5, 12 and 19 of Ex. E1-T1-S2 Table 1. Actual and imputed generation values tracked very closely during 2007 and 2008 (actual generation exceeded the imputed generation by only 0.1 TWh in each year), indicating accurate model performance. A larger variance occurred in 2009; actual generation was 0.3 TWh lower than the imputed generation. This difference represents reduced generation as a result of increased spill caused primarily by the increase in SBG experienced in 2009.

2009 Actual versus 2009 Budget
The total regulated hydroelectric production during 2009 was 5 per cent (0.9 TWh) above the 2009 plan (see Ex. E1-T1-S2 Table 1). Niagara Plant Group actual production was almost 3 per cent (0.3 TWh) above plan and R.H. Saunders actual production was 9 per cent (0.6 TWh) above plan. While SBG was significant in 2009 and resulted in reduced production due to spill, the effects of SBG were more than offset by flows that exceeded forecast values.

Production at the Sir Adam Beck plants in 2009 was 3 per cent above plan due to Niagara River flows being significantly higher than forecast. Actual annual mean Niagara River flow for 2009 was almost 102 per cent of the historical mean compared to the forecast mean flow of 92 per cent of historical mean corresponding to the forecast plan for 2009 prepared in 2007. Total production at DeCew Falls in 2009 was within 1 per cent of plan.

R.H. Saunders production exceeded plan production by 9 per cent (0.6 TWh) during 2009 due to significantly higher St. Lawrence River flows. Actual annual mean St. Lawrence River flow for 2009 was 103 per cent of the historical mean compared to the forecast mean flow of 93 per cent of the historical mean corresponding to the forecast plan for 2009 prepared in 2007.
Dry conditions existed when the 2009 forecast was prepared in 2007. (Net basin supplies to Lake Erie had been well below normal since May 2007) It was assumed that these conditions would persist in the short-term and that flows would remain below normal during 2008 and 2009. However, above average precipitation occurred during the winter of 2008 and net basin supplies to Lake Erie increased to significantly above average, resulting in Niagara and St. Lawrence River flows recovering to more or less normal for much of 2008 and 2009.

2009 Actual versus 2008 Actual
The total regulated hydroelectric production for 2009 was 2 per cent (0.4 TWh) above 2008 production. (See Ex. E1-T1-S2, Table 1).

Niagara Plant Group production was 2 per cent (0.3 TWh) higher in 2009 than 2008. Production at the Sir Adam Beck plants was more than 3 per cent (0.4 TWh) greater in 2009, while production at DeCew Falls decreased by 8 per cent (0.1 TWh). The increase in Niagara Plant Group production is attributable to termination of OPG’s obligation to return "Canadian Niagara Power replacement" energy to FortisOntario (formerly Canadian Niagara Power) as of April 30, 2009 (see Ex. A1-T4-S2). As a result, the quantity of energy returned to FortisOntario in 2009 reduced by about 0.4 TWh.

The 8 per cent (0.1 TWh) decrease in production at DeCew Falls during 2009 is attributable to DeCew Falls I being out of service for the entire year as explained above.

Production at R.H. Saunders increased by 2 per cent (0.1 TWh) from 2008 to 2009, as St. Lawrence River flows increased by 3 per cent. The annual mean St. Lawrence River flow for 2008 was equivalent to the historical mean, while the 2009 mean flow was 103 per cent of historical mean.

2008 Actual versus 2008 Budget
The total regulated hydroelectric production for 2008 was 9 per cent (1.6 TWh) above the budget forecast developed in 2007 and approved by the OEB as part of EB-2007-0905.
Production at the Sir Adam Beck plants exceeded the budget by 7 per cent (0.7 TWh) as Niagara River flows during 2008 were significantly higher than those forecast at the time of budget preparation. The annual mean flow for 2008 was 99 per cent of the historical mean compared to a forecast annual mean corresponding to 89 per cent of the historical mean assumed for the budget.

Production at DeCew Falls was almost 6 per cent (0.1 TWh) above budget due to actual diversion flows exceeding forecast budget flows. In the 2008 budget forecast, lower diversion flows had been assumed coincident with periods of planned Seaway Canal maintenance during January and February of 2008. Actual diversion flows were 20 to 25 per cent higher than expected during these months, resulting in increased production at DeCew Falls.

R.H. Saunders production in 2008 was 12 per cent (0.8 TWh) above budget. St. Lawrence River flows during 2008 were significantly higher than the flows forecast at the time of budget preparation in 2007. The actual annual mean flow for 2008 was equivalent to the historical mean, whereas the annual mean of the budget forecast flows was 88 per cent of historical mean.

Dry conditions existed when the 2008 budget forecast was undertaken in 2007. (Niagara and St. Lawrence River flows were below normal, ranking about lower quartile.) It was assumed that these conditions would persist in the short-term and that flows would remain below normal during 2008 and 2009. However, above average precipitation occurred during the winter of 2008 and net basin supplies to Lake Erie increased to significantly above average, resulting in Niagara and St. Lawrence River flows recovering to more or less normal for much of 2008 and 2009.

2008 Actual versus 2007 Actual
The total regulated hydroelectric production for 2008 was 4 per cent (0.8 TWh) more than the actual production for 2007 (see Ex. E1-T1-S2 Table 1).
The Niagara Plant Group production for 2008 was 4 per cent (0.5 TWh) higher than the actual production for 2007. Production at the Sir Adam Beck plants was almost 3 per cent (0.3 TWh) higher in 2008. Annual mean Niagara River flows increased from 97 per cent of historical mean in 2007 to 99 per cent of historical mean in 2008. Production at the DeCew Falls plants in 2008 increased by 22 per cent (0.2 TWh) when compared to 2007. Production at DeCew Falls II was reduced in 2007 due to a major rehabilitation outage.

Actual production at R.H. Saunders for 2008 was 4 per cent (0.3 TWh) more than the actual production for 2007 due to an increase in St. Lawrence River flows. The annual mean St. Lawrence River flow for 2008 was similar to the historical mean, compared to the actual mean flow for 2007 which was 96 per cent of the historical mean.

**2007 Actual versus 2007 Budget**

The total regulated hydroelectric production during 2007 was 4 per cent (0.7 TWh) above the 2007 budget. Actual Niagara Plant Group production was 4 per cent (0.4 TWh) above budget and actual R.H. Saunders production was 5 per cent (0.3 TWh) above budget.

Production at the Sir Adam Beck plants in 2007 was almost 5 per cent (0.5 TWh) above budget primarily due to Niagara River flows being above plan. Actual annual mean Niagara River flow for 2007 was about 97 per cent of the historical mean compared to the budget mean flow which was about 91 per cent of the historical mean.

Total production at DeCew Falls during 2007 was 2 per cent lower than budget production. Water availability from the Seaway Canal was restricted at times during November and early December 2007, due to volatile fluctuations in water level elevations on Lake Erie associated with wind activity. Consequently, production was lower than plan for these months.

R.H. Saunders production exceeded budget by almost 5 per cent (0.3 TWh) during 2007 due to higher St. Lawrence River flows. Annual mean St. Lawrence River flow for 2007 was 96 per cent of the historical mean, whereas the budget mean flow was 91 per cent of the historical mean.
Niagara River and St. Lawrence River flows were below normal when the 2007 budget forecast was prepared in early fall of 2006, and below normal flows were expected to continue through 2007. However, local basin supplies to Lake Erie abruptly increased (due to rainfall) and were significantly higher than normal from October 2006 to January 2007, resulting in flows increasing to above normal levels later in the fall and continuing to early 2007. Flows typically remained near or above normal levels during the early part of 2007, but decreased to below normal during the latter part of the year.