

TORONTO STAFF REPORT

May 8, 2001

To: Board of Health
From: Dr. Sheela V. Basrur, Medical Officer of Health
Subject: Air Quality and Lakeview Generating Station: Response to Provincial Proposal

Purpose:

To propose a Board of Health response to the provincial proposal respecting the conversion of the Lakeview Generating Station.

Financial Implications and Impact Statement:

No direct financial implications for Toronto Public Health or the City of Toronto.

Recommendations:

It is recommended that the Board of Health:

- (1) convey to the Ontario Minister of the Environment strong support for the proposal to cease burning coal at the Lakeview Generating Station and that the proposed regulation must:
 - (a) establish an air emission rate for NO_x that would require the use of high efficiency combined cycle natural gas turbines (CCGT) after April 2005;
 - (b) establish a cap on the annual volume of NO_x emitted after April 2005 that ensures that the total volume of emissions from the plant is truly and significantly reduced relative to 1999;
- (2) send a copy of this report to the Ontario Minister of Health and Long-Term Care, the Ontario Minister of Energy and the Ontario Minister of the Environment; and

- (3) the appropriate City officials be authorized and directed to continue to take the necessary action to give effect thereto.

Background:

On April 6, 1999, the Board of Health considered a report submitted by the Medical Officer of Health entitled “Changes in Ontario’s Electrical Sector and Air Quality” and adopted a series of recommendations encouraging the provincial government to establish a regulatory framework for the electrical sector that would encourage a shift from coal to natural gas.

At its meeting of July 24, 2000, the Board of Health considered two reports prepared by the Medical Officer of Health entitled, “Lakeview Generating Station – Health and Environmental Impacts” and “Significance of the Nanticoke Coal-Fired Plant for Toronto’s Air Quality”, and recommended, among other things, that the Premier of Ontario and the Ontario Minister of the Environment require that all coal-fired generating stations in Ontario be converted to natural gas. This recommendation was adopted by City Council at its meeting of August 1-3 2000.

At its meeting of September 25, 2000, the Board of Health considered a report entitled “Air Quality and Ontario Power Generation’s Announcement” and reaffirmed its earlier recommendations with respect to the need for the provincial government to establish a regulatory framework that will ensure conversion of coal-fired power plants to natural gas.

On March 25, 2001, the Ontario Minister of the Environment announced the provincial government’s proposal to require that the Lakeview Generating Station cease burning coal by April 30, 2005. The notice of the proposal entitled, “Lakeview Thermal Generating Station Emissions Limits” was posted on the Environmental Bill of Rights (EBR) Registry on March 26, 2001 with a 30-day comment period. Comments were prepared by staff at Toronto Public Health and submitted to the Ministry of the Environment on April 24, 2001. This report seeks the Board of Health’s endorsement of the comments submitted.

This report has been reviewed by staff in Works & Emergency Services and Corporate Services.

Comments:

Summary of Provincial Proposal:

The proposal posted on the EBR indicates that the proposed regulation would require that Lakeview Thermal Generating Station:

- (a) cease to burn coal by April 2005;
- (b) meet the emissions performance of an efficient natural gas technology if used to produce electricity after April 2005;

- (c) cap its emissions of nitrogen oxides (NO_x) at 3.9 kilotonnes (reported as nitric oxide {NO}) per year between January 1, 2002 and December 31, 2004; and
- (d) cap its emissions of NO_x at 1.3 kilotonnes from January 1, 2005 to April 30, 2005.

The companion piece entitled, “Emissions Reduction Trading System for Ontario” which was also posted on the EBR in March 2001, further indicates that:

- (a) the NO_x cap that applies to “other electrical generation” after 2005 would include NO_x emissions from Lakeview if it is operated as a natural gas-fired station; and
- (b) emissions trading will allow facilities to exceed their NO_x and sulphur dioxide (SO₂) caps by up to 33% and 10% respectively each year. (In other words, Lakeview could emit up to 5.2 kilotonnes of NO_x per year from January 2002 to December 2004.)

Support Conversion Away from Coal:

The proposal to require that Lakeview cease to burn coal after April 2005 is a sound one that would substantially reduce the release of air pollutants that contribute to smog, acid rain, global climate change and the accumulation of mercury in the food chain.

As indicated in the Ministry’s March 2001 report, “Coal-Fired Electricity Generation in Ontario”, Lakeview was responsible for 26% of the SO₂ emissions and 8% of the NO_x emitted in the Greater Toronto Area in 1999. It was also the second largest emitter of mercury in the GTA. By requiring that Lakeview cease to burn coal in 2005, the Ministry would be eliminating the release of about 18,000 tonnes of SO₂ and 83 kilograms of mercury into the GTA on an annual basis.

Earlier Conversion of Existing Boilers:

A two-year conversion period would be preferable. In July 2000, Toronto’s Board of Health recommended “full conversion of the Lakeview Generating Station to natural gas within two years” when it adopted Toronto Public Health’s modelling report, “Lakeview Generating Station – Health and Environmental Impacts”. While the Ministry has partially addressed the public health concerns related to the date of conversion by proposing an interim cap for NO_x that reduces emissions from 1998 levels (ie.7.8 kilotonnes), it has not addressed SO₂ emissions from the plant.

Modelling conducted for Toronto Public Health suggests that Lakeview is responsible for a significant percentage of the SO₂ measured in Etobicoke’s air both on an annual basis (up to 10-20%) and during worst case scenarios (up to 46%). Toronto’s Air Pollution Burden of Illness study estimated that SO₂ directly contributes to approximately 119 premature deaths and 170 hospital admissions in Toronto each year, while indirectly contributing to another 119 premature deaths and 339 hospital admissions when converted to sulphates.

Require Combined Cycle Natural Gas Turbines After 2005:

The language in the notice of proposal suggests that emission performance rates (i.e. tonnes per unit of electricity generated) would be applied to the plant after April 2005, rather than caps on the total volume of emissions. The proposal also indicates that these emission performance rates would be established at a level that requires the use of “efficient natural gas technology” in the plant. This language implies to many that emission performance rates would require the use of combined cycle natural gas turbines (CCGT) that reduce NO_x emissions by about 90% and carbon dioxide (CO₂) emissions by about 60%, while virtually eliminating SO₂ and mercury.

However, in the March meeting of the provincial Anti-Smog Action Plan (ASAP) Operating Committee, a representative of the Ministry of the Environment indicated that emissions performance rates could be established at levels that would reduce the existing emission performance rate by about 40%. This reduction could be achieved by simply converting existing boilers to natural gas, and would not meet the definition that many would apply to an “efficient natural gas technology”. Therefore, it is recommended that the proposed regulation establish a NO_x emission rate that necessitates the use of high efficiency CCGT (i.e. at least a 90% reduction in the existing NO_x emission rate).

Require a Cap on Total Emissions:

From a public health perspective, it is the total volume of NO_x emissions from the Lakeview Generating Station that is of concern, and that depends upon the plant’s generating capacity and electrical production as well as the air emission rates achieved with the technology used. Given that Lakeview has been operating at a fraction of its operating capacity for a number of years (15% in 1995 to 28% in 1999), it is conceivable that total NO_x emissions could stay at existing levels if generation from the plant increases substantially in the future. (NO_x emissions could actually increase if the NO_x emission rate is reduced by only 40% of the current rate.) Therefore, it is recommended that the proposed regulation establish a cap that limits the total NO_x emissions from the plant to levels that are a fraction of today’s emissions (i.e. lower than 2 kilotonnes).

It is recognized that few companies would be willing to invest in new high efficiency technology for the Lakeview plant if it is limited to the electrical generation of the 1990s. However, Toronto Public Health’s modeling report suggests that the Lakeview plant could generate four times as much electricity as it did in 1997 and release only a fraction of the NO_x that were emitted in 1997 if it employed high efficiency CCGT. An increase in electrical generation at the Lakeview Generating Station, if achieved with high efficiency CCGT, could have benefits for regional air quality by displacing electrical generation at coal-fired generating stations such as Nanticoke.

Conclusions:

The provincial proposal to require that Lakeview cease to burn coal after April 2005 is a sound one that will benefit human health and the environment. The regulation proposed for Lakeview should establish a NO_x emission rate that requires the use of high efficiency combined cycle

natural gas turbines (CCGT) after April 30, 2005 to maximize reduction in emissions of carbon dioxide and NOx. The proposed regulation should also establish a cap on the annual volume of NOx emissions allowed after April 30, 2005 to ensure that total emissions are truly and significantly reduced from 1999 levels.

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