Cumulative Effects Assessment (CEA) in Air Approvals

Published April 26, 2018

Effective Date October 1, 2018

Ministry of the Environment and Climate Change

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Évaluation des effets cumulatifs dans les autorisations environnementales relatives aux émissions atmosphériques

Le ministère de l'Environnement et de l’Action en matière de changement climatique (le ministère) a élaboré une nouvelle politique au sujet de l’évaluation des effets cumulatifs dans les autorisations environnementales relatives aux émissions atmosphériques afin de prendre en considération de manière plus efficace les répercussions cumulatives de sources multiples de pollution atmosphérique. Cette politique aide les décisionnaires à évaluer la nécessité d’exiger que les installations réglementées prennent des mesures additionnelles pour gérer la qualité de l’air à l’échelle locale, outre les mesures déjà prises pour se conformer à la réglementation sur la qualité de l’air à l’échelle locale. De façon plus précise, cette politique renforce et clarifie la question des effets cumulatifs au moment de prendre des décisions relatives aux autorisations environnementales pour les activités visées à l’article 9 de la Loi sur la protection de l’environnement de l’Ontario.

Cette politique s’applique aux nouvelles installations ainsi qu’aux installations agrandies qui émettent du benzène ou du benzo[a]pyrène dans certaines parties de la région de Hamilton/Burlington. Le ministère continuera à surveiller la région de Sarnia/Corunna afin de déterminer si les seuils d’intervention changent.

Le directeur pourrait exiger que les installations aient recours à la ou aux meilleures technologies disponibles afin d’atteindre les niveaux d’émission les plus bas possible, en fonction des seuils d’intervention dans une région donnée. En vertu de cette politique, il se pourrait que de meilleures mesures de contrôle de la pollution atmosphérique soient requises, même si l’installation respecte la norme de qualité de l’air en vertu du règlement sur la qualité de l’air à l’échelle locale (O. Reg. 419/05: Air Pollution – Local Air Quality), selon le seuil d’intervention défini.

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1 Introduction and Background

1.1 Overview

The Ministry of the Environment and Climate Change (ministry) has developed a policy for Cumulative Effects Assessment (CEA) in air approvals to consider more effectively cumulative impacts from multiple air pollution sources. This policy aids the decision-maker in evaluating whether additional actions to manage local air quality are required by regulated facilities beyond those already taken to comply with the local air quality regulation. Specifically, this policy strengthens and clarifies the consideration of cumulative effects when making decisions related to environmental compliance approvals (ECAs) for activities governed by section 9 of the Ontario Environmental Protection Act (EPA).

The policy applies to new and expanding facilities that operate in selected areas of Hamilton/Burlington and that emit benzene or benzo[a]pyrene. The ministry will continue to monitor the Sarnia/Corunna area to see if the action levels change.

The Director may require the facility to use best available control technology or technologies to achieve the lowest possible emission rates, depending upon the levels in an area. Under the policy, enhanced air pollution controls may be required even if the facility meets the air standard under Ontario's local air quality regulation (O. Reg. 419/05: Air Pollution – Local Air Quality), depending on the action level identified (see Table 2-1: Management actions associated with action levels for carcinogens).

1.2 Ontario's Air Quality Framework

Ontario helps protect general air quality through a comprehensive air management framework that includes regulations, targeted programs and partnerships with other jurisdictions to address sources of air pollution. This framework addresses emissions from the electricity sector, vehicles, and cross-border sources as well as commercial and industrial facilities. The local air quality regulation works within the framework by regulating air contaminants released into communities by various sources, including local industrial and commercial facilities.

1.3 Ontario's Local Air Quality Regulation

The local air quality regulation allows for three compliance approaches for a facility to demonstrate environmental performance and make improvements when required. A facility can:

1. meet the general air standard
2. request and meet a site-specific standard
3. register and meet the requirements under a sector-based technical standard (if available).

Air standards are used to assess a regulated facility's contribution of a contaminant to air. Those facilities that exceed the air standard need to abate or comply with the regulation through a site-specific or technical standard.

Under the local air quality regulation, facilities estimate their contribution of a contaminant to air through air dispersion modelling or a combination of modelling and monitoring. This information is summarised in an Emission Summary and Dispersion Modelling (ESDM) report by facilities applying for an ECA or, for facilities engaging in activities prescribed by O. Reg. 1/17, in order to register in the Environmental Activity and Sector registry (EASR).

Under Ontario's local air quality regulation, both site-specific standards and technical standards already consider best available control technology or technologies or best operational practices.

2 Policy Detail

Available monitoring data from stations across the province was reviewed to identify contaminants that exceeded carcinogen-based ambient air quality criteria (AAQCs). In both the Sarnia and Hamilton areas, monitoring values for benzene and benzo[a]pyrene exceeded their respective AAQCs. There were also multiple facilities reporting emissions of those substances to the National Pollutant Release Inventory in those areas that could have a cumulative effect. Multi-source modelling was carried out to estimate geographic areas where ambient air concentrations/risk levels of benzene and benzo[a]pyrene are over the action levels based on the multiple sources.

For this initial policy application, AERMOD, an air dispersion model used under the local air quality regulation, was used for the multi-source modelling. This model takes contaminant emission rates from identified sources (industrial and non-industrial), along with local meteorological data, to predict air concentrations from the combined sources and how they are dispersed in an area.

For the Hamilton multi-source model, the emissions of benzene and benzo[a]pyrene were modelled individually and then combined to estimate the areas where the action levels (e.g. AAQCs or lifetime incremental combined cancer risk) would be exceeded.

These two contaminants are known carcinogens and were considered additively, which is an approach used by the United States Environmental Protection Agency (US EPA).

For the Sarnia multi-source model, only benzene was modelled. In earlier work to support development of the technical standards for the petroleum and petrochemical sectors, the ministry determined that industrial emissions of benzo[a]pyrene did not significantly contribute to modelled levels beyond the property line and, therefore other tools may be needed to address sources of benzo[a]pyrene not regulated by the local air quality regulation.

The multi-source modelling used to support the development of this policy was described in the Technical Background on Multi-Source Air Dispersion Modelling. Since the November 2017 proposal posting, the ministry has made some refinements to these models, including:

- Version 16216r of the US EPA AERMOD air dispersion model was used in place of Version 13350. This is most recent version currently approved for use by the ministry.
- The meteorological data was preprocessed using version 16126 of the US EPA AERMET meteorological data preprocessor.
- The contributions for benzo[a]pyrene from road sources have now been included in the multi-source model for Hamilton.
- Updated tail pipe emissions from MOVES2014a were incorporated and the modelling assumptions were revised to better represent the raised skyway in response to technical comments.
- In Hamilton, a larger modelling domain was used to better delineate action areas.

These updates reflect appropriate refinement of the multi-source model and allow for better delineation of action level areas, but did not change the types of action level areas in the communities.

The ministry will maintain the multi-source models for Hamilton/Burlington and Sarnia/Corunna described above. Over time the ministry will continue to refine the models and consider the use of a different model to support this policy (e.g. CALPUFF). An interactive map will be available by October 1, 2018. In the interim, proponents within the municipal boundaries of Hamilton/Burlington can contact the ministry to confirm if their facility would be within the geographical area of this policy.

2.1 Management (action levels and associated requirements for approval)

If a facility applying for an ECA is located in an area identified as Action Level 2 or 3, management actions may be required of the facility even if it is meeting the air standard(s) for CEA contaminants. Action levels for the carcinogens of 1 in a million, 10 in a million and 100 in a million lifetime incremental cancer risk were chosen based on existing policy in the local air quality regulation's Guideline for the Implementation of Air Standards in Ontario (as amended).

Action level areas are identified based on the multi-source modelling results of both industrial and non-industrial air emission sources. These are summarized in Table 2-1: Management actions associated with action levels for carcinogens. Based on the modelling results, Sarnia/Corunna has areas identified as Action Level 1 while areas of Hamilton/Burlington are identified as Action Level 1, 2 and 3. This means that facilities in Hamilton/Burlington may have to undertake additional action as described below.

Table 2-1: Management actions associated with action levels for carcinogens

Action Level of CEA Contaminants (Cumulative Concentration/Risk in Air of multiple sources)	Management Actions
Less than 1 in a million lifetime incremental combined cancer risk	Does not trigger further action
ACTION LEVEL 1 1 to 10 in a million lifetime incremental combined cancer risk	No further action for industry. Triggers periodic evaluation (by ministry) to determine if the Action Level changes
ACTION LEVEL 2 Greater than 10 to 100 in a million lifetime incremental combined cancer risk	ECA Applications for new or expanding facilities: 1. may be required to include a technology benchmarking report with some exceptions (see section 2.2) 2. may be required to include best available pollution control methods
ACTION LEVEL 3 Greater than 100 in a million lifetime incremental combined cancer risk	ECA Applications for new or expanding facilities may be required to: 1. include a technology benchmarking report with some exceptions (see section 2.2) 2. include pollution control methods to achieve the lowest possible emission rates as compared to an existing pollution source of the same kind globally

2.2 Process for Applying for an Environmental Compliance Approval (ECA)

This policy will guide the s. 9 Director when he or she is considering an ECA application for a new or expanding facility that (i) is located in an Action Level 2 or 3 area of Hamilton/Burlington and (ii) emits or is proposed to emit benzene and/or benzo[a]pyrene to air.

An ECA application will be considered to be an application for a new facility if,

(i) no construction of any part of the facility has occurred before the date that the ECA application was received by the Ministry, and

(ii) no ECA has been issued in respect of any part of the facility before the date that the ECA application was received by the Ministry.

An ECA application will be considered to be an application for an expanding facility if it is in respect of a modification at the facility that will result in:

(i) an increase in production rate; or

(ii) a net increase in the POI concentrations for benzene or benzo[a]pyrene compared to the ESDM report that was submitted in respect of the facility's current approval; or

(iii) an increase in emissions of benzene or benzo[a]pyrene

This policy applies to an ECA application received by the ministry after October 1, 2018.

For ECA applications to which this policy applies, a Technology Benchmarking Report (TBR), prepared in accordance with the ministry's Guide to Requesting a Site-Specific Standard, Appendix A: Technology Benchmarking Reports (as amended), may be submitted with the ECA application. The requirement for a TBR does not apply with respect to ECA applications for equipment or sources that are considered negligible for emissions of benzene and benzo[a]pyrene in accordance with the *Procedure for Preparing an Emissions Summary and Dispersion Modelling Report* (as amended).

Pre-submission consultation for facilities that emit CEA contaminants in these Action Level 2 and Action Level 3 areas is encouraged. For an ECA application pertaining to an expanding facility, a pre-submission consultation may determine that no TBR is necessary if the documentation clearly indicates that the new equipment or source of CEA contaminants meets Best Available Control Technology; or the source of CEA contaminants is negligible; or the source is not a dominant source of CEA contaminants.

The pre-submission consultation may also allow for discussion regarding the scope of the TBR. For example, the TBR for new facilities could be scoped to all non-negligible sources of the CEA contaminants. Similarly, the scope of a TBR for new equipment at an existing facility would be focused on the new equipment if they are dominant sources of the CEA contaminants.

Facilities should request a pre-submission consultation with the ministry at least 9 months in advance of an ECA application submission. The ministry will meet with facilities in advance of an application submission (typically up to 2 years before), but facilities should contact the ministry at least 9 months in advance of an application submission. For clarity, it is not mandatory for a new/updated ESDM report to be available if the company comes for the pre-submission meeting. However, the ministry would expect that adequate information is provided so that the ministry can assess the need for a technology benchmarking report to be submitted with the ECA application.

The following information will be required for pre-submission consultation:

- Address of the specific location of the facility (or facilities if joint ESDM report) with the property and municipal boundaries.
- Sector description and facility description including the primary six-digit NAICS code and any other applicable six-digit NAICS codes for the facility.
- Descriptions of all sources and processes that discharge the benzene and benzo(a)pyrene at the facility.
- Any preliminary ESDM report/modelling of relevant CEA Contaminant including whether or not the source that is part of the ECA application is a negligible source or a dominant source.

- Discussion of data quality for emission rates.

- If applicable, discussion of the extent to which the new equipment are dominant sources of the CEA contaminants. Dominant sources are those determined to contribute most to the maximum POI and/or community. (See ministry's *Guide to Requesting a Site-specific Standard, Appendix A: Technology Benchmarking Reports*). This should include a table that shows all the sources of CEA contaminants and their relative contribution to the maximum point of impingement and nearby receptors.

- Descriptions of current (or proposed) management methods (e.g. Material Substitution, Process Change, Add-on Controls) used for each relevant CEA Contaminant.

- A description of how the relevant sources that are part of the ECA application meet best available control or lowest available emission rates.

The ministry will review the information gathered during the pre-submission consultation and confirm whether a technology benchmarking assessment and/or other information is required with the ECA application.

If, following the pre-submission consultation, the facility is required to submit a technology benchmarking assessment, the following should be submitted with the ECA application:

a. A copy of the ministry's advice from the pre-submission consultation (Note: this is to be submitted with the ECA application even if the facility does not need to submit a technology benchmarking assessment).

b. TBR for all dominant sources of the CEA Contaminant(s). The proponent must identify the technology proposal on submission of TBR and ECA application.

c. A description of the relevant CEA Contaminant(s) loading, maximum POI concentrations from the facility, including if the POI concentrations are increasing, decreasing or remain the same as a result of the ECA application.

d. An indication of whether the dominant sources of the CEA Contaminant in the application will be the result of an investment of new capital including new equipment which may or may not be linked to an increase in production.

Depending on when the TBR review is received by the ministry, it will be assessed by the ministry either prior to, or with the ECA review. The proposal notice on the Environmental Registry for the ECA application will include reference to the application of this CEA policy. The implementation schedule of the technology measures identified in the technology benchmarking will be considered for inclusion in the ECA as terms and conditions.

This policy is used to support the ECA process by providing guidance to proponents when submitting ECA applications and to the ministry when reviewing and assessing ECA applications. However, a decision-maker is not bound to follow this guidance if information in the ECA application warrants that a different decision be made.