

Ministry of Environment, Conservation  
and Parks

Ministère de l'Environnement, de la Protection de  
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September 17, 2019

Ms. Wendy Bracken  
[wendy-ron@sympatico.ca](mailto:wendy-ron@sympatico.ca)

Dear Ms. Bracken

Re: Questions for MECP Information Session- Durham York Energy Centre, June 7, 2019

Thank you for your email dated May 31, 2019 in which you provided the ministry with a document containing a number of questions for MECP in advance of our June 7, 2019 information session held at the Durham York Energy Centre.

As requested, a written response has been prepared to address each of the questions in your attached document in order of appearance:

### **Questions to MECP for Friday, June 7<sup>th</sup>, 2019**

#### **Ambient Air**

1. Nitrogen Oxide Ontario Standards: In Ontario Regulation 419 Schedule 3, the standards for Nitrogen Oxides are stated as follows:

- One Hour Standard: 400  $\mu\text{g}/\text{m}^3$
- 24 Hour Standard: 200  $\mu\text{g}/\text{m}^3$
- Annual: None

How old are the above standards for Nitrogen Oxides? Are the standards health-based? If so, please identify what studies and the date of the underlying studies.

**The air standards for nitrogen oxide (NO<sub>x</sub>) were developed in 1972 as Ambient Air Quality Criteria (AAQC). Nitrogen oxide standards were adopted into the Local Air Quality Regulation (O. Reg 419) in 2005 when the regulation was introduced to replace Regulation 346 (now revoked). Ontario Regulation 419/05 air standards and AAQCs are numerically the same but they are used differently.**

**Yes, the 24-hr air standard of 200  $\mu\text{g}/\text{m}^3$  and the 1-hour air standard of 400  $\mu\text{g}/\text{m}^3$  are both health based as it is reflected on the Air Contaminants Benchmarks (ACB) List.**

Although the supporting information is limited, the recommended criteria for NO<sub>x</sub> at 400 µg/m<sup>3</sup> (or 0.2 ppm) for 1 hour and 200 µg/m<sup>3</sup> (or 0.10 ppm) for 24 hours were considered at the time of development to be below effects levels.

The maximum acceptable limits for NO<sub>x</sub> were based primarily on the following considerations:

- 1 hour at 400 µg/m<sup>3</sup> is below the level of 415 µg/m<sup>3</sup> which is where emissions are immediately detectable by the majority of young, healthy people and;
- 400 µg/m<sup>3</sup> is about one-tenth the value at which there is an increased resistance of air flow into and out of the lungs immediately after exposure while in the presence of an equal concentrations of sulphur dioxide.
- After a 24-hour exposure at 200 µg/m<sup>3</sup>, there is no evidence of any health effects even if there is simultaneous exposure to 260 µg/m<sup>3</sup> of sulphur dioxide (SO<sub>2</sub>).

2. New CCME Air Quality Standard for Nitrogen Oxides: The Canadian Council of Ministers of the Environment recently endorsed new and much more stringent Canadian Ambient Air Quality Standards (CAAQS) for Nitrogen Oxides and Sulphur Dioxide ([https://www.ccme.ca/en/current\\_priorities/air/caaqs.html](https://www.ccme.ca/en/current_priorities/air/caaqs.html)). Will the MECP be updating its Regulation 419 standards for Nitrogen Oxides, and, if so, when is that update anticipated?

The ministry as a member of the CCME contributed to the development of the CAAQS for nitrogen oxides (NO<sub>x</sub>) and sulphur dioxide (SO<sub>2</sub>).

The ministry is not currently updating Ontario's air standard for NO<sub>x</sub> but should an update occur, the ministry would consider the scientific information obtained through the CAAQS process.

The ministry also expects to use the new CAAQS to monitor ambient air quality and evaluate long-term trends and to identify areas that may have local air quality concerns due to pollution from transportation, industry and other sources.

The new CAAQS could also be considered as part of the evaluation of the human health risk assessment (HHRA) if submitted as part of an Environmental Assessment (EA). It is important to note that a HHRA carried out as part of an EA is not used as a compliance tool.

3. Expected Exceedances for Sulphur Dioxide and Nitrogen Oxides: Durham Region Report 2018-INFO-38 Sections 4.3, 4.4 state:

4.3 SO<sub>2</sub> is continuously measured at the upwind and downwind ambient air monitoring stations, and results remain well below the current standard of 690 µg/m<sup>3</sup>. Assessing the current SO<sub>2</sub> results against the future CAAQS standard of 100 µg/m<sup>3</sup> indicates that regular exceedances will occur once the new levels are regulated. Ambient air monitoring conducted prior to the DYEC commencing operations would also result in exceedances of the lower 100 µg/m<sup>3</sup> SO<sub>2</sub> proposed standard.

4.4 The CAAQS for nitrogen dioxide (NO<sub>2</sub>) was recently lowered to 60 parts per billion (ppb)

starting in 2020. The current standard in Ontario for NO<sub>2</sub> is 200 ppb. It is likely that the Ontario standard for this parameter will also be lowered in the near future resulting in future ambient air monitoring exceedances.

[https://icreate7.esolutionsgroup.ca/11111068\\_DurhamRegion/en/regionalgovernment/resources/Documents/Council/CIP-Reports/CIP-Reports-2018/March-2018/2018-INFO-38.pdf](https://icreate7.esolutionsgroup.ca/11111068_DurhamRegion/en/regionalgovernment/resources/Documents/Council/CIP-Reports/CIP-Reports-2018/March-2018/2018-INFO-38.pdf)).

Durham Report 2019-COW-3 Sections 6.16, 6.17 states:

6.16 In 2018, the MECP passed new air standards for sulphur dioxide (SO<sub>2</sub>). Along with new stack emission standards, the ambient air quality criteria were also lowered significantly. The change corresponds to the changes made to the SO<sub>2</sub> Canadian Ambient Air Quality Standards at the federal level and are intended to apply to large geographic areas that form a single air shed. While the DYEC stack tests and continuous emissions monitoring are consistently below the regulatory limits, it is very likely that the ambient air monitoring stations operated by the Region will show exceedances for SO<sub>2</sub> due to various activities in the surrounding area when the new standards take effect in 2020 (Federal) and 2023 (Ontario).

6.17 In addition to the new standards for SO<sub>2</sub>, lower standards have also been proposed 70 Report #2019-COW-3 Page 36 of 41 for nitrogen dioxide (NO<sub>2</sub>). These standards have not yet been finalized but again will likely result in exceedances at the ambient air monitoring stations operated by the Region near the DYEC. While not directly attributable to the DYEC, exceedances at the ambient air monitoring stations require staff and consultant time to investigate and report. This situation will continue as ambient air quality standards are lowered.

(<https://calendar.durham.ca/meetings/Detail/2019-01-16-0930-Committee-of-the-Whole-Meeting/9f1052ef-e427-4684-8e18-a9dd0100c626>) Both reports predict exceedances .

How does the MECP consider such information when evaluating an EA application for an expansion that will further add to the local burden?

**An Environmental Assessment that include a human health risk assessment (HHRA) must consider new limits as part of the evaluation process. A HHRA carried out as part of an EA is not used as a compliance tool but would require that the current state of the science be used as part of the evaluation for the HHRA.**

**Air standards and Ambient Air Quality Criteria (AAQC) are numerically the same but they are used differently. AAQCs are used as non-regulatory targets to evaluate air quality resulting from all sources of a contaminant to air. Air standards are regulatory tools used to assess compliance of a facility.**

**The standards for nitrogen oxides (NO<sub>x</sub>) under O.Reg. 419/05 are unchanged. However, the standards for sulphur dioxide (SO<sub>2</sub>) were updated in 2018. There is a five-year phase in period, and the new standards will come into effect July 2023.**

**Air standards under the local air quality regulation are based on the use of air dispersion models to assess compliance. Under the facility's existing Environmental Compliance Approval, the maximum off-property concentration of sulphur dioxide from the facility is 9.33 micrograms/cubic metre for the 1-hour average. The future corresponding standard is 100 micrograms/cubic metre. Emissions from the facility are expected to be well below the future 1-hour SO<sub>2</sub> Schedule 3 standard.**

What does the expected exceedance information say about the state of the air shed at the site?

**Ambient air monitoring results in South Clarington are similar to other areas of Ontario and the GTA and do not indicate any cause for concern. The ministry will continue to review ambient monitoring data around DYEC and in Durham Region**

What actions does MECP take if Regulation 419 standards are exceeded?

**Air standards are used to assess the contributions of a contaminant to air by a regulated facility. If facilities exceed the standard they must act to reduce contaminant levels to meet the provincial air standard or as low as reasonably achievable by operating under a site-specific or technical standard.**

**A facility must also notify the ministry if they have a modelled or monitored exceedance of a standard or guideline, or if an Upper Risk Threshold (URT) may be exceeded. URTs are set out in Schedule 6 of the Regulation. Potential exceedance of an URT requires more timely actions from a facility.**

**To achieve its compliance and enforcement objectives, the Ministry legislation authorizes a variety of tools. The response to any incident must be proportionate to the risk presented by the incident, the compliance history, and the response of the violator to the incident. Tools include education and outreach, warnings, orders and prosecutions.**

Outdated standards were used to characterize risk in the Human Health Risk Assessment submitted as part of the original EA. How will more stringent and updated standards impact health risk considerations of the MECP on any future expansion?

**A Human Health Risk Assessment submitted as part of an EA must to use the most up to date and scientifically defensible air standards, guidelines or criteria to characterize potential exposures and human health risks at the time in which the Human Health Risk Assessment is submitted.**

4. Other Pollutants: How old are the Regulation 419 standards for other pollutants emitted by the incinerator including arsenic, lead, nickel, zinc, copper, mercury, lithium, ozone, particulate matter and carbon monoxide and are the standards health-based? What standards are anticipated to be updated in the near future?

**Information with respect to the identified Regulation 419 air standards are presented below. These standards are some of the 130 air standards listed in Regulation 419/05, of which 69 are new or have been updated since 2005.**

**It is worth noting that even though some air standards have not been recently updated, it does not mean that they are not protective of human health and the environment.**

| <b>Contaminant</b>            | <b>CAS #</b> | <b>Basis</b>                   | <b>Year</b> |
|-------------------------------|--------------|--------------------------------|-------------|
| Arsenic and compounds         | 7440-38-2    | Health-based air guideline     | 1981        |
| Lead and Lead Compounds       | 7439-92-1    | Health-based air standard      | 2007        |
| Nickel and Nickel Compounds   | 7440-02-0    | Health-based air standard      | 2011        |
| Zinc                          | 7440-66-6    | Particulate-based air standard | 1974        |
| Copper                        | 7440-50-8    | Health-based air standard      | 1974        |
| Mercury (Hg)                  | 7439-97-6    | Health-based air standard      | 1974        |
| Lithium (other than hydrides) | 7439-93-2    | Health-based air standard      | 1974        |
| Ozone                         | 10028-15-6   | Health-based air standard      | 1974        |
| Particulate matter            | N/A          | Visibility; air standard       | 2005        |
| Carbon monoxide               | 630-08-0     | Health-based air standard      | 1974        |

Will the MECP be introducing a regulation for PM<sub>2.5</sub> in the near future?

**The ministry has not established a regulation for PM<sub>2.5</sub> as key sources of the pollutant, like transportation and residential sources, are not captured under Regulation 419/05.**

**The ministry focuses on setting air standards under the regulation for substances that form fine particulate matter in air. Much of the PM<sub>2.5</sub> that is attributed to industry is formed by the reaction of other contaminants, such as SO<sub>2</sub> and NO<sub>x</sub>, rather than being directly emitted.**

5. Benzo(a)pyrene Exceedances: There have been a number of benzo(a)pyrene ambient air exceedances as well as a soil exceedance for this pollutant. What investigation has the MECP done with regards to these exceedances?

**There is no data from the ambient air monitoring program that would indicate that there is a trend of elevated benzo(a)pyrene concentrations attributed to the DYEC.**

**Benzo(a)pyrene often exceeds the 24-hour average Ambient Air Quality Criteria (AAQC) throughout Ontario in both rural and urban settings due to the contribution of combustion sources and diesel engines.**

Please specify other locations in Ontario that have also had exceedances and the values of those exceedances.

**Environment and Climate Change Canada's National Air Pollution Surveillance Program (NAPS) Gage (urban station) & Simcoe (rural station) stations measure B(a)P. Below are the 2013-2016 exceedances at these stations:**

- **ECCC NAPS station exceedances of 24-hour B(a)P AAQC (0.05 ng/m<sup>3</sup>):**
- **Gage 2013: 23 exceedances, maximum concentration 0.19 ng/m<sup>3</sup>**
- **Simcoe 2013: 5 exceedances, maximum concentration 0.07 ng/m<sup>3</sup>**

- **Gage 2014: 7 exceedances, maximum concentration 0.08 ng/m<sup>3</sup>**
  - **Simcoe 2014: 6 exceedances, maximum concentration 0.29 ng/m<sup>3</sup>**
  - **Simcoe 2015: 5 exceedances, maximum concentration 0.13 ng/m<sup>3</sup>**
  - **Simcoe 2016: 6 exceedances, maximum concentration 0.43 ng/m<sup>3</sup>**
- 
- **ECCC NAPS station exceedances of annual B(a)P AAQC (0.01 ng/m<sup>3</sup>):**
  - **Gage 2013: 0.06 ng/m<sup>3</sup>**
  - **Simcoe 2013: 0.02 ng/m<sup>3</sup>**
  - **Gage 2014: 0.04 ng/m<sup>3</sup>**
  - **Simcoe 2014: 0.03 ng/m<sup>3</sup>**
  - **Simcoe 2015: 0.03 ng/m<sup>3</sup>**
  - **Simcoe 2016: 0.03 ng/m<sup>3</sup>**

6. **Ambient Air Dioxin/Furan Exceedances:** On May 26<sup>th</sup>, 2018 there was an ambient air exceedance for dioxins and furans at the Courtice WPCP station. All three stations had elevated concentrations. Subsequent second (split sample) analysis lab results showed values in exceedance at both the Courtice WPCP station and at the Crago station.

Meteorological data showed that it was a very calm day.

Dioxin/furan concentrations increased with distance of the stations from the incinerator. In MECP's investigation of the exceedance, in addition to wind *direction*, what other factors did MECP consider?

Did the MECP consider wind speed and calms and, if so, what was the analysis? What other sources did the MECP consider?

Did the MECP investigate what other facilities were operating on that day, and, if so, what was found?

**The ministry's assessment of measured and modelled data indicates that winds generally originated from the southwest placing the Courtice station upwind from the DYEC. This means that winds reaching the Courtice station were not coming from the direction of the DYEC. The low wind speeds measured during the sampling period add some uncertainty to the recorded wind directions and make it difficult to determine potential sources.**

**Furthermore, a review of the continuous emission monitoring system during May 26, 2018, indicated that the facility was operating normally. There were no process upsets or other operational issues during the ambient air monitoring period.**

**In addition, during the week of May 29, 2018 (May 29 to June 1) the annual voluntary source test program was completed. This source test program was scheduled and undertaken prior to knowledge of the May 26 result. The facility was operating normally throughout the source test. The results of the source testing were below the analytical detection limit of <11 picograms per cubic metre (pg/m<sup>3</sup>). The DYEC in-stack limit is 60 pg/m<sup>3</sup>. The source testing program results were obtained within 3 to 5 days of the ambient air monitoring period.**



**There are many potential sources of dioxins and furans in the vicinity of the monitoring stations including residential/commercial wood burning and diesel fuel combustion. All dioxin and furan sources contribute to ambient air concentrations and air quality in Clarington which is similar to other areas in Ontario and the GTA. The continuation of the ambient air monitoring program will enable the ministry to assess trends over time and may help to identify potential sources that affect local ambient air quality.**

Did the MECP look at the dioxin/furan congener profiles and, if so, what did they show?

**No, the ministry has not reviewed the dioxin/furan congener profiles.**

Did the MECP review the AMESA cartridge results to see how the sample for that month compared and, if so, what was found?

**The AMESA data collected during the month of May 2018 was not reviewed and assessed by the ministry as part of the review of the May 26 elevated concentration.**

**As stated in the Environmental Compliance Approval (ECA), the AMESA system is for the long-term monitoring of dioxins and furans in emissions.**

While the MECP no longer attends the EFWWMAC meetings, does the MECP review the archived tapes? There was considerable discussion at the August 23rd, 2018 EFW-WMAC meeting regarding this exceedance and the MECP should be made aware of the concerns expressed by members at that meeting, including a member with significant work experience in such matters (archived tape can be found at <https://www.eventstream.ca/events/durham-region> with the exceedance discussion starting at about 45 minutes to about the 1 hour 30 minute mark).

**No, the ministry does not routinely review the recorded EFWMAC meetings.**

**Members of the community are encouraged to contact MECP directly should you have questions or concerns.**

7. Ambient Air Test Frequency for Dioxin/Furans: Currently ambient air dioxin and furan samples are taken one day in every twenty-four days, while other pollutants are sampled more frequently. Given the toxicity of dioxins and furans, and the stack exceedances and ambient air exceedance for this pollutant experienced in the first three years of operation, will the MECP consider increasing the frequency of ambient air testing for this pollutant?

**Since operation of DYEC there has been one daily concentration above the 24-Hour Dioxins and Furans AAQC. AAQC is set at a concentration at which adverse effects are not expected.**

**The non-continuous (every 24-day) dioxins and furans sampling follows the US EPA accredited methodology and the National Air Pollution Surveillance Program sampling schedule. The 24 day sampling period was determined to be an acceptable sampling frequency at the outset of the monitoring program as stated in the Ambient Monitoring Plan.**

### AMESA Long-Term Sampling System (AMESA LTSS)

1. Condition 7.3 a) of the ECA states that "The Owner shall develop, install, maintain and update as necessary a long-term sampling system , with a minimum monthly sampling frequency, to measure the concentration of Dioxins and Furans in the Undiluted Gases leaving the APC Equipment associated with each Boiler." It also states that the performance of the AMESA sampling system will be evaluated during annual Source Testing "in accordance with the principles outlined by 40 CFR 60, Appendix B, Specification 4". When did the focus on the AMESA device measuring dioxin/furan concentration and evaluating/comparing against stack test results change to a focus on correlating the results between AMESA and stack?

**As required in the Environmental Compliance Approval the purpose of the system is to evaluate the performance of the long-term sampling system to determine Dioxins and Furans emission trends and/or fluctuations. As indicated to you during the April 26 meeting, the ongoing evaluation of the system may also allow correlation of AMESA and source test results. That does not mean that the purpose or focus of the AMESA system has changed.**

2. What modifications have been done to the AMESA Long-Term Sampling System and why was each modification sought? When were each of the modifications carried out and what were the results?

**There have been no changes or modifications that deviate from the original purpose of the AMESA system.**

3. Did the MECP approve changes to the AMESA Long-Term Sampling System and, if so, who at the MECP approved the changes and was the Minister made aware of this potential change to the Condition?

**As previously indicated, there have been no changes or modifications that deviate from the original purpose of the AMESA system. The Regions and Covanta continue to evaluate the system as part of the AMESA work plan that was reviewed by the ministry.**

4. Was the MECP involved or copied on discussions between the AMESA manufacturer and/or other consultants regarding the AMESA LTSS?

**Ministry staff have had discussions with Covanta on the AMESA LTSS. This information has been provided to the manufacturer by Covanta. As well, the AMESA work plan was developed with the assistance of the manufacturer and input from the ministry.**

5. The AMESA devices are accredited by agencies in Europe. Does the MECP recognize/acknowledge those accreditations? Are there other facilities in Ontario using the AMESA LTSS? In Canada or North America?



**The ministry usually considers other regulatory jurisdictions in the development of its own ongoing validation processes, as is the case with the validation of the AMESA system. The ministry is not aware of any facilities in Ontario, Canada or North America that use an AMESA system**

Modifications to Dioxin/Furan Testing Methods

1. In the approved Air Emissions Monitoring Plan, the compliance stack testing methods that are specified for Dioxins and Furans are Environment Canada methods.

Documentation posted on the Environment Canada website indicated that any changes to the Environment Canada reference test method must be approved by Environment Canada. There have been some modifications to the dioxin and furan stack testing methods which have been documented in the reports done by AirZone for the Region of Durham. Has MECP approved all deviations from and/or changes to the Environment regarding the changes that have been made?

**As indicated in the AirZone report, the change to US EPA Method 23 do not affect the validity of the source test results. The change to the method has been accepted by the ministry.**

If you have any questions please contact me at (905)442-3105, [celeste.dugas@ontario.ca](mailto:celeste.dugas@ontario.ca) or Phil Dunn at (905)424-2808, [philip.dunn@ontario.ca](mailto:philip.dunn@ontario.ca).

Yours truly,



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