

Terms of Reference (ToR)

Clarkson TSA Air Quality Study

The City of Mississauga is developing land use policies for the TSA to support intensification of the area. It is recognized that with possible redevelopment of this area and introduction of new sensitive land uses, there would be a need to assess air quality impacts on proposed new sensitive developments, especially given the historical state of air quality in the area. The air quality studies are intended to be used to assess the compatibility of proposed development blocks within the TSA. The ToR is prepared by taking into consideration the state of the historic air quality in the area and relevant air quality guidelines and reference documents, including:

This assessment is required to consider the possible introduction of sensitive land uses within the Southdown Employment area of the Clarkson TSA.

- The Environmental Protection Act R.S.O. 1990 Chapter E19;
- Ministry of the Environment, Conservation and Parks (MECP) Regulation 419/05 - Local Air Quality;
- MECP D-Series of Guidelines for Land Use Compatibility;
- Ontario's Ambient Air Quality Criteria (AAQC); and,
- The Clarkson Airshed Study¹ and updated Clarkson ambient monitoring reports (2012 – 2018) prepared by Clarkson Airshed Industrial Association (CASIA).

Follow-up air quality monitoring was recommended in the original Clarkson Airshed Study¹ undertaken by the Province. At the conclusion of the monitoring study, benzene, dichloromethane, and acrolein were identified as air contaminants that exceeded their respective Ambient Air Quality Criteria (AAQCs). Since the conclusion of the Clarkson Airshed Study, there has been a general improvement in the air quality of the region², however, there is no sufficient monitoring data to conclude that benzene, dichloromethane, or acrolein are currently below acceptable levels. This Terms of Reference is divided into two parts: Air Quality Monitoring and Dispersion Modelling, both of which are intended to help better characterize the status of air quality in the area. It is the intension of the City to rely on the findings of such studies to guide their decision making and approval process for the proposed intensification within the Clarkson TSA, including the introduction of sensitive land uses such as: schools, daycares, places of worship, healthcare facilities and residential land uses.

Ambient Air Quality Monitoring Program

Ambient air quality monitoring should be performed in accordance with the Ontario Ministry of the Environment, Conservation and Parks (MECP) *Operations Manual for Air Quality Monitoring in Ontario* (the Manual). The following outlines the recommendations for the Clarkson Ambient Air Quality Monitoring Program:

- The air monitoring system should be sited as per the recommendations of the Manual, in consideration of the specific requirements for particulate matter, sulphur dioxide, nitrogen

¹ Clarkson Airshed Study - A Scientific Approach to Improving Air Quality – Updated 2009

oxides, and VOCs (specifically: benzene, dichloromethane, and acrolein). The air monitoring system should be located in the southern portion of the Clarkson TSA such that the conditions of the Manual (e.g., setback distances from emission sources) can be achieved. The optimal location for the monitoring would be in the southwest quadrant of the intersection of Southdown Road and Royal Windsor Drive. Variation from this proposed siting, or from the Manual, should be reviewed and approved by the City prior to installation of monitors.

- Monitoring should be conducted for nitrogen oxides, total suspended particulate matter (TSP), sulphur dioxide (SO₂), benzene, dichloromethane, and acrolein. Monitoring should be conducted such that each contaminant can be compared against the relevant AAQC statistical averaging periods (i.e., hourly, daily, and annual averages and percentile values).
- Sampling equipment should be selected in consideration of the contaminants being measured and the requirements of the Manual. The Manual provides several equipment options for each air contaminants.
- Monitoring should be conducted for a minimum of six months, and should include the summer period
- Data collection should be conducted following the frequency outlined in the Manual for both continuous (e.g., NO_x) and non-continuous (e.g., PM and VOCs) sampling.

Based on the surface area of the Clarkson TSA and sources of air contaminants in the area, the results from the ambient air monitoring program will generally be representative of the entire study area. As such, execution of separate ambient air monitoring programs may not be required for each individual development within the study area, however, information gathered from ambient air quality monitoring may need to be updated from time to time to better characterize the state of air quality in the area.

Results of the monitoring study are to be compared against Ontario's AAQC, for the relevant averaging periods, using appropriate statistical analysis (see AAQC). The results of the ambient air monitoring study is considered to be representative of ambient air quality concentrations within the Clarkson TSA.

² Clarkson Air Quality, Noise & Vibration and Radiofrequency Compatibility Overview Study, Dillon Consulting, 2019

Dispersion Modelling Study

For each proposed development block (See **Figure 1**), a dispersion modelling study is to be performed to assess air quality at that specific block. Significant sources may include both industrial and transportation sources. The significant sources will change based on the development block being considered as determined by a licensed professional and to the satisfaction of the City.



Figure 1 – Proposed Development Blocks – Clarkson TSA

Industries within the study area should be classified and assessed as per the MECP's D-Series of Guidelines. Where the proposed development is within the Potential Area of Influence of an industry, an assessment of compatibility should be performed, which is to include dispersion modelling as applicable.

The potential air quality impacts of major roadways and/or railways within 500 m of the proposed development should be considered for inclusion in the dispersion modelling study, as applicable. Determination of the requirements for a dispersion modelling study for transportation-related sources (e.g., road and rail) should be determined by a licensed professional and confirmed by the City.

Dispersion modelling should be conducted in accordance with the MECP's "Guideline A-11 Air Dispersion Modelling Guideline for Ontario", including the following project-specific considerations:

- Consideration should be given to large sources in proximity to Lake Ontario. Any active source

exceeding 50 m in height within 1 kilometre of the lake should be assessed with an appropriate shoreline fumigation model. Examples of shoreline fumigation models include, SCREEN3, CALPUFF, and Shoreline Dispersion Model (SDM).

- The dispersion modelling study should consider the built forms of each development in the final build- out of the Clarkson TSA when determining the impact of building effects. Where no built form has been established, consideration should be given to general building massing when performing the modelling and maximum building heights as per the preferred concept plan.
- All elevated points of reception (e.g., balconies, windows, air handling units) should be included as discrete receptor points within the dispersion modelling.

The results of the dispersion modelling should be combined with the results of the ambient air monitoring study to determine the predicted cumulative concentrations of each contaminant, where applicable (Note: this would be the case for a scenario in which contribution of an air contaminant source is not accounted for in the ambient air monitoring data). For contaminants which are not included in the monitoring study, ambient concentration data should be obtained from the relevant MECP or Environment and Climate Change Canada monitoring station. The 90th percentiles of ambient concentrations are to be used to provide a conservative measure of the background concentrations. The cumulative concentration (i.e., modelled concentration + 90th percentile background) should be summarized using the appropriate statistical method and compared to the AAQC.

If the cumulative concentration of a contaminant is below the relevant AAQC, it can be concluded that air quality is likely to be acceptable for that contaminant. Should the cumulative concentration of all contaminants be below the relevant AAQCs, and the compatibility assessment show that land uses are compatible as per the MECP's Guideline D-6, no further action would be required. Should the cumulative concentration of a contaminant exceed the relevant AAQC, further consideration is required. In such situations the frequency and magnitude of the exceedances is to be quantified and the results be reviewed by a qualified human-health risk assessment expert in order to determine appropriate implications and consideration of any mitigation measures for the proposed development / intensification. The results and analysis of the air quality studies are to be peer reviewed by a licensed professional representing the City of Mississauga and review comments / deficiencies are to be addressed prior to issuance of the studies for City's decision making and approval process.