Issues/Concerns With Ambient Air Monitoring

By Wendy Bracken

Please find listed comments below that pertain to the Final Report on Ambient Air Monitoring of the Courtice Road Station, June 2009. They are listed in no particular order.

Concerns With Scope of Ambient Air Monitoring

On page 2-1 of the Final Report on Ambient Air Monitoring of the Courtice Road Station, June 2009, it states that "Air quality contaminants of concern measured for this study were determined in consultation with the Human Health and Ecological Risk Assessment (HHERA) team. The ambient air monitoring program at the Courtice Road site included the following contaminants: Criteria Air Contaminants (CACs)-common air pollutants with known human health and environmental effects; Total Suspended Particulate(TSP) matter and metals; Polycyclic Aromatic Hydrocarbons (PAHs); and Dioxins and Furans (D/Fs).
Note the following concerns, questions and facts.

- There appears to be no rationale provided for how the above listed COPCs were selected by the team for ambient air monitoring.
- The above documents says that ambient air monitoring *included* the above list of COPCs. Were other compounds also monitored?
- Volatile Organic Compounds (VOCs) were not monitored at the site. Data for baseline conditions was obtained from stations far from the site (Newmarket, Toronto) and substituted as the Courtice baseline concentrations.
- HCl and HF were not reported as CoPCS being measured at the monitoring station and there are no baseline concentrations reported for them in the HHERA.
- Mercury was not reported as being measured at the monitoring station and there were NO Background Concentrations reported for mercury. (Table 3-10, page 36, Ambient Air Quality Technical Study Report, July 31, 2009) Mercury emissions from incinerators are a major concern. Why did the Study Team choose not to do ambient measurements for mercury at the Courtice Monitoring Station? Cumulative effects of baseline plus facility related emissions are now impossible to determine. Will the MOE accept this omission?
- Other COPC, such as PCBs were also not monitored on site.

Concerns With Amount/Duration of Ambient Air Monitoring

In Section 3.1, on pages 2-1 and 3-1 of the Final Report on Ambient Air Monitoring at the Courtice Road Monitoring Station, it is documented that:

- Continuous air quality monitors measured SO2, NOX, CO, Ozone(O3) and PM2.5 from September 2007 to December 2008.

- Two manually operated, hi-volume air samplers were installed in December 2007 to collect metals, PAHs, and D/F ambient concentration data.
- While many in the public, including myself, had the impression that the air samplers would collect samples continuously, that was not the case. On page 3-1 and in Table 3-2 on page 3-4, it is documented that from December 2007 to December 2008 dioxins and furan samples were collected for a total of 12 days (each about 1 month apart) in that one year period, PAH samples were collected for 24 days, metal samples were collected for 60 days and TSP were collected for 60 days in that one year period. On the bottom of page 3-1, it states that "The sampling schedule corresponded with the Ontario MOE province-wide ambient sampling schedule". Note the word corresponded is used. Does that mean that the sampling schedule complies with MOE criteria or regulations? Is the quantity of data sufficient for such a significant study?

Concerns with Location of Monitoring Station and Devices

- **The ambient monitoring station was located about 1.5 km to the south of Highway 401 and about 2 km southwest from the Clarington 01 Site** within the fenced area of the project office of the Courtice Water Pollution Control Plant (see Ambient Air Monitoring of the Courtice Road Monitoring Station, June 2009, Section 1.3, page 1-1). Concerns: If one assumes prevailing westerlies**, the monitoring location is upwind of the major polluter in the area, St. Mary's Cement, and it is farther west from St. Mary's than the proposed site. The monitoring station was also located quite far away from the Highway 401.** The proponents cite security and power requirements for choosing to site the monitoring station at this location.

- **Some of the MOE criteria listed in MOE's "Operations Manual for Air Quality Monitoring in Ontario, March 2008" (MOE,2008) were not met**. The following failures to meet criteria are documented in Table 1-1, Summary of Probe Siting Criteria, on page 1-3 of the Final Report on Ambient Air Monitoring of the Courtice Road Monitoring Stations, June 2009:

    - **the height of the inlets of the hi-volume samplers were too low**; the MOE criteria is that they should be 3 to 15 metres above ground, but the inlets were about 1.5 metres above ground

    - **the meteorological station was too close to the building**; the MOE criteria require that the meteorological station(measuring wind speed and direction) be 5 – 10 H (i.e. 5-10 building heights) downwind of the building, however the met station was located approximately 23.5m southwest from the 6-m tall project office building which they estimate is only about 4H from the building

- **the MOE criteria requires no trees within 20-m radius of the station, however there were two trees**, 13.8-m and 16.5-m, from the station

Significant Concerns With the Reporting of Ambient NO2 Monitoring Data

On page 4-9 and in Table 4-2 Summary of Ambient CAC Monitoring Data (Sept 2007 – Dec 2008) on page 4-3 of the Final Report on Ambient Air Monitoring at the Courtice Road Monitoring Station (June 2009) it is reported that there are **no exceedances for NO2** over the monitoring period. **An earlier document, however, did report exceedances within the monitoring period.** The Draft Interim Report on Ambient Air Monitoring At the Courtice Road Site, October 1, 2008 reported the following on page (ii) of the Executive Summary:

> *The maximum measured hourly and daily average NO2 concentrations exceeded their respective AAQCs. The hourly NO2 criteria was exceeded for 20 hours in the May to July period. Hourly exceedances occurred for winds blowing from westerly or south westerly directions in all instances.*

Section 4.2.3 on page 4-11 of that same October 1st report and Figure 4-5 and 4-6 on pages 4-12 and 4-13 respectively give more details on the NO2 exceedances. It is reported that the maximum average NO2 concentrations occurred at night-time.

This October 1 report was presented to Committee (I believe it was Joint Waste Management Group) **on October 2, 2008** and a slide show was done by the consultants. **Citizens at that meeting heard the presenting consultant report that they did not know what was responsible for the high NO2 levels.** The consultant said it could be a tractor in the vicinity. (Note also that the slide used in the October 2nd presentation which discussed the NO2 Monitoring Results stated that "Hourly exceedances occurred for winds blowing from north-westerly to south-westerly directions in all instances" which is different than what was stated in the executive summary of the October 1st Interim Report documented above.)

At a Public Information Centre held in Bowmanville in April of 2009, citizens heard a different explanation for the NO2 exceedances. **The consultants said that the exceedances were a result of air conditioning failure in the monitoring station**. In the Final Report on Ambient Air Monitoring at the Courtice Road Monitoring Station (June 2009), the failure of the climate control equipment is discussed on page 4-5 as well as the dates measured NO2 concentrations exceeded the hourly and daily AAQCs (May 31 to June 3, July 23 to 24, and July 31 to August 1, 2008) and it states that **"the data during the times the climate control malfunctioned were invalidated"**. Many questions remain. If the equipment failed multiple times from May 31st to August 1st, and the consultants were aware of exceedances, why were the operational logs not reviewed and investigation done prior to the issue and presentation of the October 1st report? There is almost a three month period from the last "failure" to the October 1st report. Why did

the consultants not report about the air conditioning failure in the October 1st report? Members of the public made delegations to Committees and Councils about the high NO2 values and exceedances for months following the October 1st , 2008 report and they were not told about any equipment failure until April 2009 during the Bowmanville PIC session. This is not acceptable and is highly questionable. Appendix E to the Final Report on Ambient Air Monitoring at the Courtice Road Monitoring Station (June 2009) deals with instrument issues. It states the remedial action to the climate control system failures as "Reset air conditioning unit on June 3, July 28, and August 1, 2008. Air conditioning unit replaced on August 7, 2008. Data on all continuous monitors invalidated during the times of the climate control system failures." (It does not say the equipment was broken, but rather needed to be "reset".)

NO2 is a very significant chemical of potential concern to this EA and is a great health concern for local residents. St. Marys Cement is very close to the proposed facility and it releases very large quantities of NO2 to the local air shed. (Could the reason that the maximum concentrations were found at night-time be due to the St. Marys' NO2 emissions as they operate 24 hours a day?). The nearby 401 is also a major source of NO2 and the planned 407 link close to the proposed site will also have significant impact. The incinerator will release further and significant quantities of NO2 to the local air shed.

Concerns With the Ambient Levels of PM2.5 and With the Interpretation of PM2.5 Results

The ambient air monitoring results document very high levels of PM2.5 which are very close to exceeding the Canada Wide Standard (CWS). The Final Report on Ambient Air Monitoring at the Courtice Road Monitoring Station (June 2009), page 4-15, documents that the 98th percentile daily average concentration and annual average concentration measured at the Courtice Road station were 28.6 and 28.8 micrograms per cubic metre. The Canada Wide Standard is 30 micrograms per cubic metre.

There is concern with how this has been interpreted/reported in the above Final Report. On page 4-15 of the Final Report it is stated that:

> It should be noted that the CWS for PM2.5 is based on a 98th percentile level exceeded each year over a 3 year period, whereas the ambient monitoring program at Courtice Road was over a 15 month period (end of September 2007 to December 2008). The measurements during this period did not exceed the CWS which is therefore, indicative that the CWS would not likely be exceeded over three consecutive years.

The above statement does not seem to be supportable. The ambient levels are very close to exceeding the CWS and so it is quite possible that they may exceed the CWS in the near future. Furthermore, Table 4-2 on page 4-3 documents a very high maximum PM2.5 value of 40.4 microgram per cubic metre and Figure P-5, Time Histories for Ambient PM2.5 Concentrations, in Appendix P to the same report, shows daily average PM2.5 monitored values exceeding the CWS value of 30 micrograms per cubic metre at least five times during the monitoring period.

High levels of PM2.5 is a major health concern as PM2.5 is well associated with known adverse health effects contributing to heart and lung disease and others.

Questions/Concerns With the Ambient PM2.5 Measurement Data

A study of Appendix J, PM2.5 Data Summary to the Final Report on Ambient Air Monitoring at the Courtice Road Monitoring Station (June 2009) raises questions. From 19:00 hours on 2/11/2008 to 16:00 hours on 2/15/2008 and again from 16:00 hours on 6/16/2008 to 1:00 hours on 6/24/2008 all of the PM2.5 entries are 0.00 micrograms per cubic metre and at all times of the day. This seems very unlikely. There appears to be no explanation given in Appendix J for these measurements. It also appears that these 0.00 entries were used in the statistical calculations for the average and could have had a very significant impact on the results.

Ambient Monitoring Shows that Ozone Levels are Already Too High

The ambient air monitoring results document very high levels of ozone which exceed the National Ambient Air Quality Objective maximum acceptable ambient air quality criteria. The Final Report on Ambient Air Monitoring at the Courtice Road Monitoring Station (June 2009), page 4-17, documents that the 24-hour and annual average concentrations were 156% and 99.7% of the NAAQO maximum acceptable ambient air quality.

Concerns With the Ambient Ozone Measurement Data

A study of Appendix K, Ozone Data Summary to the Final Report on Ambient Air Monitoring at the Courtice Road Monitoring Station (June 2009) raises many questions. From 4/16/2008 to 5/31/2008 and again from 6/4/2008 to 6/16/2008, it is noted that all ozone measurements are shown to be 0.00 micrograms per cubic metre and at all times of the day. This seems very unlikely. Both of these periods follow times where equipment failure is noted. There appears to be no explanation given in Appendix K for these measurements. It also appears that these 0.00 entries were used in the statistical calculations and could have had a very significant impact on the results. These zero measurement periods are also reflected in the Time Histories Plot for Ambient O3 Concentrations in Figure P-6 of Appendix P to the Final Report on Ambient Air Monitoring at the Courtice Road Monitoring Station (June 2009).