Toxin Use and Generation in City Operations

Executive Summary

The City of Vancouver is interested in reducing or minimizing chemical exposure in City operations. This project is aimed at developing a toxin inventory from use and generation of internal City operations. This project is part of a larger project that will seek to reduce and minimize chemical exposure across the City of Vancouver.

Initial steps in this project were to identify a list of applicable toxins to Vancouver. The selection of key substances had two criteria:
1) Toxins that are applicable/relevant to Vancouver, toxins were not discounted until suitable rationale could be provided
2) Toxins with high impact on human health

Toxins were identified through comparisons of toxic substances from the National Pollutant Registry Inventory list (NPRI), US EPA's Urban Air Toxic Pollutants and Toronto's chemical release reporting program ChemTRAC. Toxins from industries not found in Vancouver were screened, as were toxins that were already banned in Canada. In the end, 46 substances were identified as potentially applicable in Vancouver and formed the basis of the inventory work.

The toxin inventory for the City of Vancouver operations was generated by compiling the purchasing inventory for several shops across the City and matching each product with the respective MSDS form where possible in order to calculate the use/emissions of the key substances. In general, much of this inventory was difficult to obtain due to differences in inventory tracking, lack of data for size of product or total quantity purchased, and difficulty matching product name as recorded in the stock reports with the MSDS form product name. Only the Vancouver Fire and Rescue Services and Parks operations were able to provide a relatively complete inventory by the end of this project report period. Of the inventory that was gathered, a large majority of emissions were VOCs, nitrogen oxides (NOx), and particulate matter (PM). Other substances that were found at over 100 kg/year were ammonia, sulphur dioxide (SO2), and ethylene glycol.

Based on information currently available, the following product types were identified as containing the most ingredients of concern:
- Cleaners
- Primers
- Sealants

Based on information currently available, the following product types have the greatest emissions due to the amount it is being used by City operations:
- Coolants
- Oil
- Spray paints
- Windshield washers

Toxins generated by City operations were calculated for the following operations:

1. Kent Plant- Asphalt and cement plant
2. Southeast False Creek Neighbourhood Energy Utility (SEFC NEU)
3. Welding shop
4. Sign shop

These were selected based on similar operations that were found met limits to report out in Toronto's ChemTRAC program.

The four processes generate different types of pollutants. The majority of the pollutant emissions are attributed to Kent asphalt plant and Southeast False Creek Neighbourhood Energy Utility (SEFC NEU). The Kent asphalt plant emissions are mainly Criteria Air Contaminants (SOx, NOx, PM, VOCs). Criteria Air Contaminants contribute to smog formation and poor air quality. The asphalt plant already has reporting requirements to Metro Vancouver. The SEFC NEU generates mostly NOx as reported from their emissions monitoring.

In summary, limitations and recommendations include having an expert review of the list of key substances to ensure they are relevant to Vancouver; developing a better inventory system to track chemical procurement, product size, total quantity used and linked to MSDS forms; and completing the inventory for the remaining shops.