Performance Report – Pollution Prevention Planning Notice for the Polyurethane and Other Foam Sector (except Polystyrene) in Respect of Toluene Diisocyanates (TDIs)

Pollution Prevention (P2) Planning is a process by which organizations can improve their environmental protection by strategically planning to reduce or eliminate pollution before it is created.

Last updated: July 2014

Facilities subject to the P2 Planning Notice for the Polyurethane and Other Foam Sector (except Polystyrene) have prepared and initiated the implementation of their P2 plans.

This report summarizes the information in the first two reports that have been received from those facilities.

Toluene Diisocyanates (TDIs) were found to be toxic to human health under the *Canadian Environmental Protection Act, 1999* (CEPA 1999). A P2 Planning Notice (Notice) was selected as the instrument to respond to the requirements of CEPA 1999 for these toxic substances.

The objective of this Notice is to reduce potential human exposure in the vicinity of facilities releasing TDIs to air. Facilities subject to the Notice are requested to reduce their emission of TDIs to air, to the greatest extent practicable, through the application of best available techniques economically achievable, to the following limits:

- less than 100 kg per year; or
- a fence line concentration at or below 0.2 µg/m^3.

Results indicate that 100% of the reporting facilities have a P2 plan in place and anticipate meeting the risk management objective of this Notice. Also, 35% of facilities now indicate having already implemented the actions in their P2 plan. The remaining facilities have committed to implementing their P2 plan by the end of the reporting period (i.e., November 2015).

Anticipated results indicate that TDI releases to the environment will be reduced effectively by using several P2 techniques.

Context

In November 2011, Environment Canada published a P2 Planning Notice in the *Canada Gazette*. The Notice applies to any person or class of persons who, on the date of publication of the Notice or any time thereafter, meets the following two criteria:

(a) owns or operates a facility within the polyurethane and other foam sector (except polystyrene) that, at any time, purchases, imports or uses 100 kg/yr or more of TDIs;

AND

(b) is involved in one or more of the following activities:

- Manufacturing of flexible slabstock foam, flexible moulded foam, rigid foam or structural foam
- Rebonding of foam

Note that TDI storage and the cutting and shaping of the above-mentioned foams are included in these activities.

Affected persons must prepare and implement a P2 plan, based upon consideration of all the factors to consider listed in the Notice, including determining industrial releases of TDIs to air and keeping their on-site releases to air at or below 100 kg/yr or, alternatively, their TDI concentration in ambient air at or below 0.2 µg/m^3. In addition, individual facilities are required to report annually to Environment Canada for four consecutive years.

All of the 14 facilities required to report annually have done so. These reports are available to the public on Environment Canada's website at www.ec.gc.ca/planp2-p2plan/default.asp?lang=En&n=D41F25DE-1, and the information presented in this document is derived from these submissions.

Summary of releases

The Notice identifies two options for determining industrial releases of TDIs to air. Of the 14 facilities, 57% selected the option to measure or estimate actual on-site releases of TDIs to air, while 43% chose the option to predict TDI concentration at the facility boundaries using modelling. None of the facilities that measured or estimated actual on-site releases of TDIs to air exceeded the threshold of

100 kg/yr. However, 50% of the facilities that predicted their TDI concentration in ambient air surpassed the concentration threshold of 0.2 µg/m^3.

All facilities are implementing a set of actions to reduce or keep their emissions under control. Of the 14 facilities that submitted an Interim Progress Report for their P2 plan, 3 had already completed the actions listed in their P2 plan by the end of 2012 and 2 more completed theirs in 2013. For the remainder of the facilities, 1 planned to have completed the implementation of its P2 plan by the end of 2013, 5 target 2014, and the last 3 aim for 2015. All facilities are still expecting to fully implement their P2 plans by November 26, 2015.

Anticipated results for facilities that measured or estimated actual on-site releases of TDIs to air

Chart 1 illustrates the anticipated reduction in the total actual on-site releases of TDIs to air. Based on submitted information, over 213 kg of TDIs were released to air in the Preparation Year, and over 140 kg of TDIs were released during the 2013 reporting year. This represents an overall reduction of 34% of the TDI releases to air in the first year from facilities implementing their P2 plans. Once the P2 plans have been implemented, TDI releases are expected to be reduced by 81% to approximately 41.3 kg for those same facilities.[1] These results do not include releases from the six facilities that reported on concentration of TDIs at or beyond the facility boundaries, as concentration cannot be directly related to emissions.

[1] Following the review of the data submitted by the facilities for the reporting years 2012 and 2013, a new calculation related to the reductions in releases of TDIs by November 2015 yields this new estimation of 81% of reduction, which means a release of 41.3 kg from those facilities.

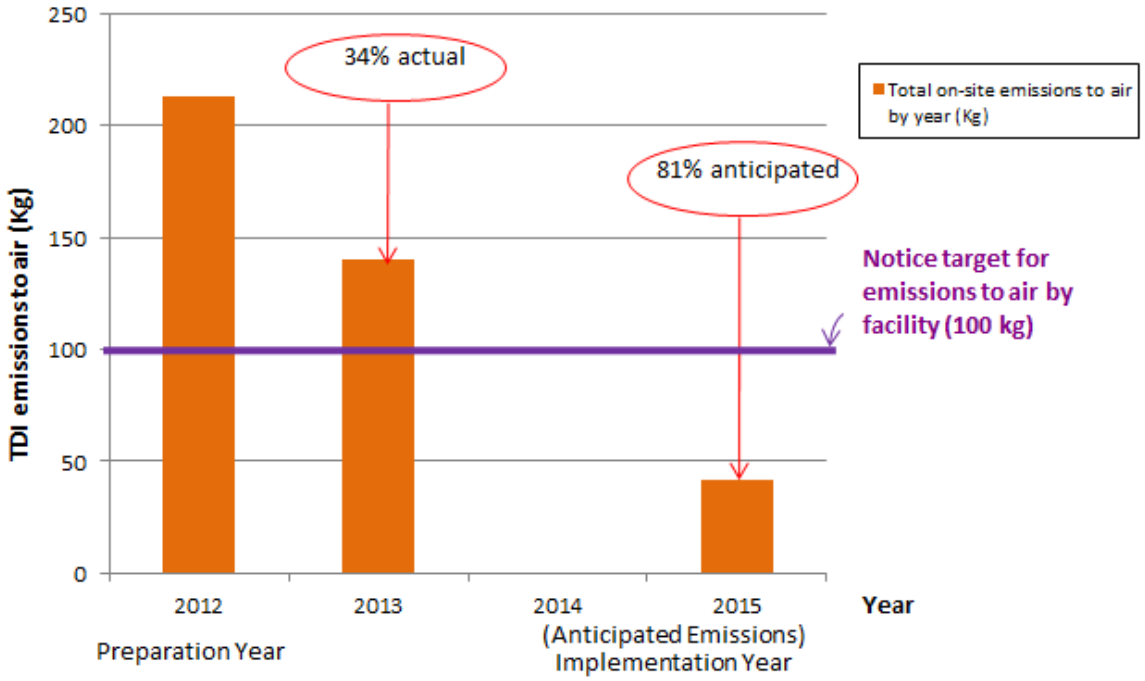

Chart 1: Total on-site emissions of TDIs to air – actual vs. anticipated

Note that although none of the facilities that measured or estimated actual on-site releases of TDIs to air exceeded the emission threshold of 100 kg/yr by facility, six of them expressed their intent to implement actions to further reduce their emissions of TDIs.

Anticipated results for facilities that predicted TDI concentration in ambient air using modelling

Chart 2 shows the results for maximum 24-hour average concentration of TDIs at the fence line for the Preparation Year and for the 2013 reporting year, as reported by the six facilities that used modelling to predict TDI concentration in ambient air. Fifty percent (50%) of these facilities surpassed the TDI concentration threshold of 0.2 µg/m^3 for both reporting years. All of these facilities, which surpassed the threshold, indicated their commitment to assess pollution control options and implement pollution prevention and environmental protection methods to reduce their emissions and keep TDI concentration at the facility boundaries at or below 0.2 µg/m^3. This would represent an average concentration reduction of 82%, expected to be achieved through the implementation of the P2 plans.

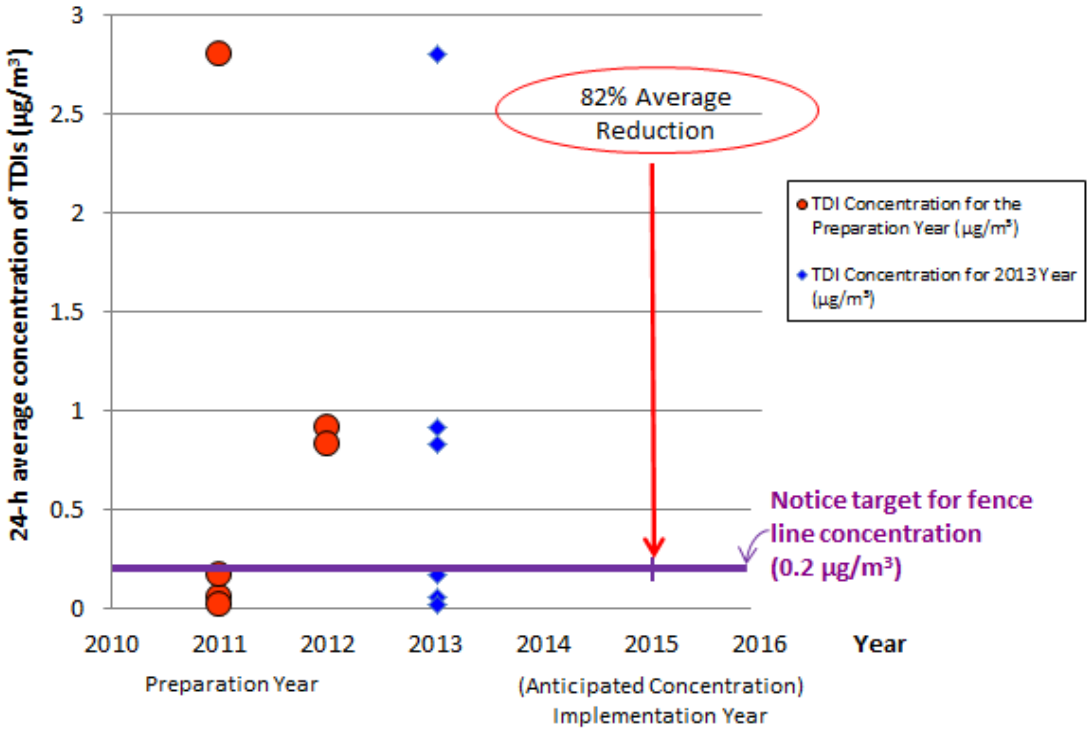

Chart 2: TDI concentration at the fence line – actual vs. anticipated

Releases of TDIs to air as reported in the National Pollutant Release Inventory

While the objective of the Notice is not an overall reduction of industrial releases of TDIs, the implementation of this Notice could have an effect on the overall reduction of releases of these substances to the environment.

Chart 3 shows a chronology of Canadian emissions of TDIs from all facilities that met the reporting threshold for TDIs within the National Pollutant Release Inventory (NPRI) since the assessment of TDIs was initiated by Environment Canada and Health Canada in 2006. Emissions started to decline progressively in 2008, when the substances were found toxic to human health. Additionally, this chart shows the estimated quantity of TDIs used annually in Canada since 2007. Annual usage of TDIs decreased considerably since 2007, with relatively minor fluctuations from year to year. Note that although the use of TDIs has not changed much in the last five years, the emissions have been reduced considerably.

Eleven (11) of the 14 facilities reporting to the P2 Planning Notice also reported to the NPRI in 2011 or have historically reported to the NPRI since 2006.

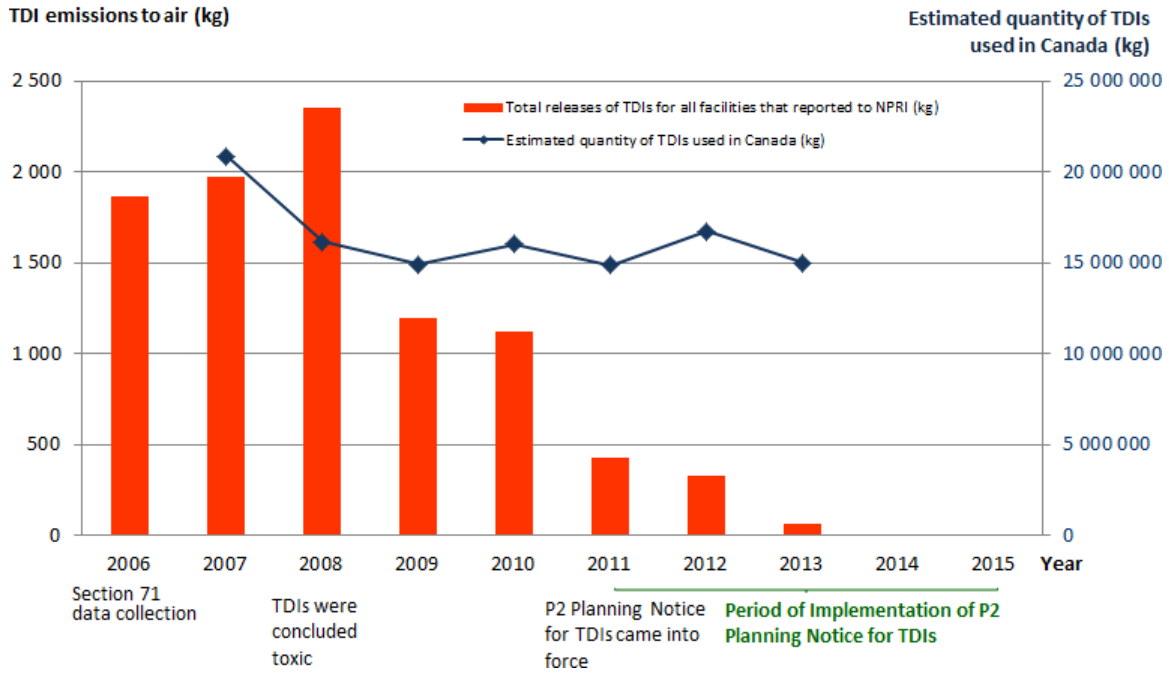

Chart 3: Releases of TDIs reported to the NPRI and estimated quantity of TDIs used in Canada (dual scale). *Sources: NPRI[2] and adapted from Statistics Canada.*

In order to improve the monitoring of emissions of TDIs, Environment Canada has proposed to reduce the reporting threshold for TDIs for the NPRI from 10 tonnes to 0.1 tonnes (100 kg). The implementation of this change is as of the 2014 reporting year, as per *Canada Gazette* publication on July 12, 2014 (http://gazette.gc.ca/rp-pr/p1/2014/2014-07-12/html/notice-avis-eng.php#na2). It is possible that total emissions may increase after this date, but it would be as a consequence of additional facilities reporting their emissions to NPRI (that had not previously been required to report) and not necessarily due to increase of uses and releases of the substances.

[2] NPRI data as of July 3, 2014. Note that the 2013 data on TDI releases to air reported to NPRI are preliminary (i.e. unreviewed). That means that these data were submitted by facilities across Canada and are presently being reviewed and analyzed by Environment Canada. These data are provided for information purposes only. Environment Canada assumes no responsibility for the accuracy, completeness or reliability of the preliminary data. No information obtained from the NPRI data shall create any warranty not expressly made herein. It is hereby acknowledged and agreed that the use of the preliminary NPRI data is done at the user's own discretion and risk.

P2 actions planned to be taken to achieve the risk management objective

The federal government believes that pollution prevention is the most effective means of protecting the environment, eliminating costly waste and promoting sustainable development. P2 focuses on avoiding the creation of pollutants rather than trying to manage them after they have been created. As a factor to consider in preparing their P2 plans, foam facilities were asked to give priority to P2 activities. In 2012, 79% of the actions planned to be taken by subject facilities during the implementation of their respective plans were P2 methods (Chart 4), of which good operating practices and training led the way (28%), followed by spill and leak prevention programs (24%). Some facilities chose a combination of P2 methods.

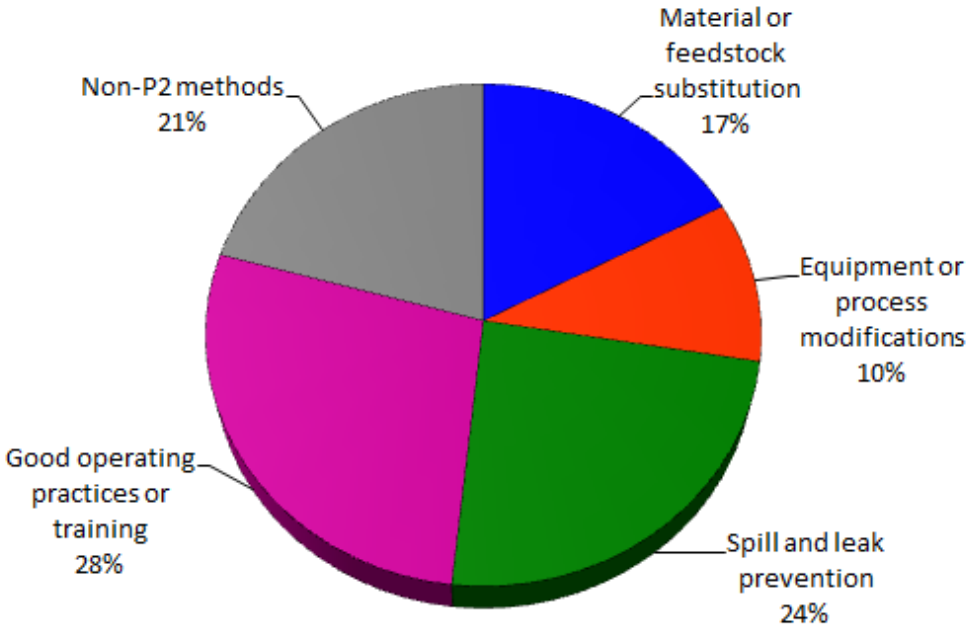

Chart 4: Distribution of P2 methods chosen by facilities subject to the Notice to reduce emissions of TDIs

Sources

- Pollution Prevention Planning Online Reporting Tool and Database: www.ec.gc.ca/planp2-p2plan
- Factsheet for P2 Planning Notice in Respect of TDIs: www.ec.gc.ca/planp2-p2plan/default.asp?lang=En&n=CB73A414-1
- Environment Canada. National Pollution Reporting Inventory web site: www.ec.gc.ca/inrp-npri
- Adapted from Statistics Canada, Annual Data on Imports and Exports for specific HS10 and HS08 Codes by Country of Origin and by Country of Destination, 2013. This does not constitute an endorsement by Statistics Canada of this report.

ISBN: 978-1-100-22075-8 Cat. No.: En14-75/1-2014E-PDF