Owens Corning Guelph Glass Plant

247 York Road Guelph, Ontario N1E 3G4

Action Plan Summary Fact Sheet – March 2015

Owens Corning is requesting from the Ministry of the Environment and Climate Change (Ministry) an interim site-specific annual standard for hexavalent chromium under Section 32 of Ontario Regulation 419/05: Air Pollution – Local Air Quality. This fact sheet summarizes the Plant's proposed Action Plan.

Actions Already Taken

A new standard for hexavalent chromium was introduced in 2011 and will become effective in 2016. Owens Corning strives to meet the future standard and has been actively pursuing reduction technologies to eliminate hexavalent chromium as a byproduct of its manufacturing and reduce emissions.

Owens Corning strives to meet the future standard and is currently implementing an Action Plan predicted to reduce concentrations by more than 85 percent by July 2016.

Comprehensive Evaluation of the Manufacturing Operation

Owens Corning is working to reduce emissions in a systemic and efficient manner to ensure optimal results. LEHDER Environmental Services Limited (LEHDER), an independent environmental consulting firm, performed a comprehensive assessment of the plant to identify all existing and potential areas of the process where hexavalent chromium is generated and emitted.

Technology Benchmarking

LEHDER worked with Owens Corning to conduct a Technology Benchmarking study to identify all possible control technologies. These options were evaluated further based on commercial availability and technical feasibility. The remaining emission control technologies (and combinations of technologies) to reduce the concentrations of hexavalent chromium were assessed and ranked based on their ability to reduce the off-site air concentrations.

Technologies and combinations of technologies in the following categories were assessed:

- Material Substitutions,
- Process Changes,
- Add-On Controls, and
- Re-engineering of exhaust points to overcome site-specific dispersion challenges.

Several specific technologies evaluated include:

- Electrostatic Precipitator or Dust Collector on furnace and forehearth stacks;
- State of the art combustion control system and improved construction techniques;
- Scrubber installation on the forehearth stack;
- Forehearth conversion to air/gas combustion; and
- Low sublimation chromium refractory.

The Technology Benchmarking Report includes a list of all options considered.

Economic Feasibility Assessment

The resulting pollution control strategies were then assessed using an Economic Analysis methodology acceptable to the Ministry. Some of the technically feasible pollution control strategies were excluded from further consideration due to the outcome of the economic feasibility assessment.

No combination or individual technology was predicted to achieve the new air emission standard for hexavalent chromium. However, Owens Corning is committed to reducing Point of Impingement (POI) concentrations of hexavalent chromium, and has selected a combination of options for implementation that are expected to reduce the predicted off-site POI concentration by more than 85 percent.

Actions Planned

The glass making process is a continuous one, which is why the process must run 24 hours a day, 365 days a year. Based on the operation cycle and investment of the furnace, the process is shut down every 10 years to enable technology upgrades. This 10 year cycle is the operational basis for the plant's request of an interim site-specific standard for a 10-year time span.

The next planned shut-down is to occur in early 2016 and opens a window of opportunity for planned improvements to be implemented prior to the new standards taking effect on July 1, 2016.

Work will not stop there. This is an ongoing continuous improvement process. Owens Corning will continue to pursue technologies toward meeting the general standard and anticipates installing additional reduction technologies in 2026, with the next planned shut-down.

Timeline	Actions
Early 2016	Replace the existing furnace with a new smaller furnace with improved technology. Install state of the art combustion controls system and use improved construction techniques on all remaining sections of the process (forehearths). Re-engineer the following stacks to overcome site-specific dispersion challenges: • furnace stacks, • remaining forehearth stack, • general ventilation exhauster for the new furnace.
2017 - 2018	Evaluate reductions using source testing.
Ongoing 2017- 2026	Review operational life span of the remaining furnace hall general ventilation exhausters and replace with re-engineered exhausters to improve dispersion.
Ongoing 2015 - 2023	Continue to evaluate, research and implement new technologies to prevent formation of hexavalent chromium at the source and limit emissions including: • research impact of air/gas combustion in the forehearths on formation of hexavalent chromium, • monitor effectiveness of further combustion control improvements/changes, • drive innovation with suppliers of low sublimation chromium (LSC) refractory including quantification of the potential to reduce the formation of hexavalent chromium, • monitor the development/emergence of technologies that decrease formation or improve capture of hexavalent chromium emissions.