

Getting tough on dirty air

by Cam Vatandoust, P.Eng.

On January 1, 2002, the Airborne Contaminant Discharge Monitoring and Reporting Regulation will require all industrial, institutional, commercial and municipal organizations in Ontario to monitor and report on their air emissions.

The first phase of the new *Airborne Contaminant Discharge Monitoring and Reporting Regulation*, which took effect May 1, 2000, required the electricity sector to monitor and report on 28 pollutants, including the key contributors to climate change, smog, and acid rain: carbon dioxide (CO₂), nitrogen oxides (NOX) and sulphur dioxide (SO₂).

The second phase of the Regulation took effect May 2, 2001, and included additional key climate change and smog precursors like nitrous oxide (N₂O), methane (CH₄), carbon monoxide (CO), particulate matter (PM_{2.5}), and volatile organic compounds. In addition to the electricity sector, the second phase of the regulation requires the submission of reports by large industrial facilities.

Ontario has seen several new environmental initiatives in recent years aimed at mitigating climate change and air toxins. These initiatives include emission reduc-

tion trading; an anti-smog action plan; regulations on ozone depleting substances; Drive Clean; Smog Patrol; an Environmental SWAT team; the Pollution Prevention Pledge Program; and the new *Airborne Contaminant Discharge Monitoring and Reporting Regulation* (O.Reg.127).

The regulation covers a total of 358 substances. Of these, 268 fall under Environment Canada's National Pollutant Release Inventory (NPRI). The NPRI is a legislated, publicly accessed inventory that provides access to pollutant release information for facilities located in communities throughout Canada. It also allows for tracking of progress in the reduction of on-site releases or off-site transfers, and encourages industry to take voluntary measures to reduce its emissions. NPRI's long term goal is to support environmental initiatives by providing information that assists in identifying priority areas for action. (NPRI data is available at: www2.ec.gc.ca/pdb/npri).

Under the Canadian Environmental Protection Act (CEPA, 1999), owners or operators of facilities that manufacture, process, otherwise use or result in by-products of, one or more of the NPRI-listed substances, and exceed the NPRI set threshold values, are required to fulfill the reporting procedures. Facilities may be exempt from reporting to the NPRI if they are primarily used for education or training, maintenance or repair of transportation vehicles, sale of fuels, retail sale of NPRI substances, renewable natural resources, mining, drilling, dentistry, and have fewer than 10 full-time employees.

The remaining 90 substances not listed under the NPRI are divided into two categories, according to the Regulation. Eleven substances are considered "criteria air contaminants and greenhouse gases" and the remaining 79 contaminants have graded MOE thresholds.

Emission sources covered under the Regulation are: combustion, manufacturing and processing, solvent evaporation, storage, and fugitive emission sources. Owners and operators must choose an estimation technology to determine the emissions, such as a continuous

emissions monitoring system (CEMS); predictive emission monitoring (PEM); source testing; mass balance; emission factors; emission estimating model; or engineering calculation.

As governments respond to new environmental challenges by developing policies and setting in place regulations and potential mitigating measures, professional engineers will play an increasing role in developing these standards. O.Reg.127 was developed by MOE staff, including professional engineers and scientists, through consultations and input from the public and industry. PEO's Government Affairs and Environment committees were also involved in the consultations and development of the regulation.

Emissions data from industry will be used to set new guidelines in reducing emissions by setting future goals for the industry. Inevitably, engineers will provide new specialized services to the industry in order to meet the reporting deadlines and comply with the emission reduction targets.

PEO's regulatory input in the practice of professional engineering has been, and continues to be, valued by policy makers and other key stakeholders. PEO's recent work in partnership with government includes the *Drinking Water Protection Regulation* (August 2000), Pre-Start Health and Safety Reviews (April 2001), and the *Technical Standards and Safety Act* (June 2001).

Shaping new policies and regulations will require PEO's continued input in order to protect public health and safety. Partnership among all stakeholders, including the public, government policy makers, industry, and PEO is the key to success. As accountable practitioners, each one of us has a fundamental professional responsibility in safeguarding public interest, by contributing to the well being of our planet and its ecosystems. ♦

References

Global Environment Outlook GEO-2000; United Nations Environmental Programme (www.grid.unep.ch)
Intergovernmental Panel on Climate Change (www.ipcc.ch)

Global stress factors

Air pollutants contribute to global warming, posing great risks and vulnerability to natural and human systems. Global warming affects hydrology and water resources of systems that are currently stressed.

Approximately one-third of the world's population live in countries that are "water-stressed." This number is projected to sharply increase with global population growth. Urbanization and socioeconomic factors, along with our increasing population, place additional burdens on the planet's ecosystems. While stream flow and groundwater recharge rates are decreasing, frequency of severe weather events are on the rise, which could mean more people will suffer from hunger, malnutrition, and disease.

Although increased atmospheric carbon dioxide (CO₂) concentrations can stimulate crop growth, the benefits on global agriculture and food security are expected to be offset by the adverse effects of excessive heat and drought, resulting in increased production costs. Reduction in crop yields and food production will also contribute to malnutrition, particularly in the developing world. Asia currently produces 80 per cent of the world's aquaculture. Climate change and pollution puts the wild stocks under additional stress.

The present downward trend in global commodity prices is expected to continue in the 21st century with agricultural incomes in developing countries declining, affecting small producers and poor urban consumers.

The planet's ecosystems are affected by accelerated erosion, loss of estuaries, rises in the global sea level and surface temperatures, decreasing ice cover, changes in salinity, and ocean circulation. Changes in the global climate will trigger regional ecosystem changes resulting in a shift in species populations and dominance, as well as migration changes. Ocean and sea ecosystems generally do not tolerate environmental change. The result will likely have significant impact on the fish dependent populations in developing countries.

Increased concentrations of air pollutants together with increased frequencies of heat waves could mean more heat- and respiratory-related deaths and illnesses, the greatest numbers among children, the elderly and the poor.

Climate change will increase insurance costs, and slow the expansion of these services in the developing world, resulting in increased demand on government-funded compensation, placing a greater demand on OECD countries that contribute to such funds.

Environment Canada (www.ec.gc.ca)

National Pollutant Release Inventory (www2.ec.gc.ca/pdb/npri)

National Center for Environmental Economics (www.epa.gov/economics)

Environment News Service (ens-news.com)

Ministry of the Environment: (www.ene.gov.on.ca)

Ministry of Labour (www.gov.on.ca/lab/main.htm)

Ministry of Consumer and Business Services (www.cbs.gov.on.ca/mcbs/english/welcome.htm)

Technical Standards and Safety Authority (www.tssa.org)

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