Proposed Amendments for the Environmental Emergency Regulations Under Section 200 of the Canadian Environmental Protection Act (CEPA) 1999

Kimberly Hradecky
Presentation to the 56th Canadian Chemical Engineering Conference (CSChE)
October 15-18, 2006
Section 199

- Authority to require the preparation and implementation of Environmental Emergency (E2) Plans for CEPA toxics (Schedule 1: List of Toxic Substances) or for substances the Ministers of the Environment and Health have recommended be added to the List.

Section 200

- Regulation-making authority of Part 8

- Authority to establish a list of toxic and other hazardous substances with related threshold quantities (not limited to CEPA toxics)

- Authority to require the preparation and implementation of E2 Plans for the listed substances at or above specified threshold quantities
Timelines


- **E2 Regulations** come into force 90 days after registration: November 18, 2003

- **3 Notices required after coming into force:**
  - Within 90 days: Notice of Identification of Substance and Place
  - Within 6 months: Notice of Plan Preparation
  - Within 1 year: Notice of Plan Implementation and Testing
Environmental Emergency (E2) Regulations

- Address emergency prevention, preparedness, response and recovery

- Benefits to be realized regardless of cause
  - i.e. accidental, vandalism or terrorist activity

- Flexible as opposed to prescriptive approach to be taken, however, key elements must be addressed

- Consensus on using CRAIM list and thresholds
E2 Regulations

- Applies to any person who uses or stores one or more of the 174 substances above the specified quantities or who has a container for that substance equal to or exceeding the threshold.

- To date about 3,400 facilities have submitted declarations for the current environmental emergency regulations.

- Schedule 1 of the Regulations is divided into Part 1 (76 flammables) and Part 2 (98 other hazardous) substances.
Obligations

- E2 plans are not submitted to Environment Canada unless requested

- First notice of identification required if either:
  - Maximum quantity equals or exceeds threshold; OR
  - Largest container capacity equals or exceeds threshold

- Preparation and Implementation of an E2 plan required if both:
  - Maximum expected quantity equals or exceeds threshold; AND
  - Largest container capacity equal or exceed the threshold.

- Environment Canada must be notified accordingly
Exemptions

- Amounts temporarily stored for 72 hours or less in a container not normally located at the place
- Quantities in a container with capacity of 30 kg or less
- Quantities of substance when it is a component of another substance in Schedule 1
- Quantities of a substance when it is a component of natural gas
- Quantities of a substance in fuel tank supplying engine of conveyance
- Quantities of a substance regulated under *Transportation of Dangerous Goods Act*
Contents of an E2 plan

- Identification of any potential environmental emergencies that can possibly occur, including both on-site and off-site consequences to human health and the environment;
- Description of associated prevention efforts underway as well as the preparedness, response and recovery capabilities of the facility;
- A list of individuals who are to respond to an environmental emergency and a description of their roles and responsibilities;
- Identification of the training required for each of those individuals; and
- A list of the equipment which may be used in emergency response and is included as part of the environmental emergency plan and the equipment’s location.
Improving the Regulations
Proposed Amendments

- Clarify Requirements;
  - Exception to farmers using ammonia as agricultural nutrient
  - Exception for propane when stored in a container with a capacity of less than 10 tonnes and located from at least 360 m from the property limit
  - Specify TDGA exemption to everything except loading/unloading

- Notification and Reporting
  - Limit notification/reporting to mixtures captured
  - Use of existing provincial or TDG threshold for E2 notification and reporting

- New provision exempting slag, waste rock in tailings, ores and ore concentrates

- New provision for permanently closed or decommissioned sites

- Add 31 substances from the Toxic Substances List (some from within classes of substances, Inorganic fluorides – sulphur hexafluoride) and 3 substances of concern based on toxic assessment results
E2 Amendments Background:
“Toxic Substances” list
E2 Amendments Background:

- List made up of substances, that had been released to the environment (i.e. effluents, emissions, spills), that have been detected in sufficient quantities to cause harm to the environment
- Do these need emergency plans?
List of Toxic Substances (Schedule 1)
http://www.ec.gc.ca/ceparegistry/subs_list/Toxicupdate.cfm

- 49 Toxic Substances were examined
  - A total of 97 substances were reviewed as some Toxics Substances are classes of substances (i.e. Inorganic fluorides – Sulphur hexafluoride)

- 31 Substances are being proposed for addition to the E2 Regulations plus an additional 3 substances of concern
E2 Analysis of Substances:

- Acute catastrophic spills
- Stored
- Toxic via Inhalation?
- Vapour Cloud Explosion?
- Toxic to Aquatic Life?
- Carcinogenic to humans or wildlife?
- Reactive?
E2 Analysis of Substances (cont.):

Not Included:

- Effluents
- Emissions
- By-products or contaminants
- Laboratory reagents
- No emergency pathway
- Substances covered under other acts
- Not in Canadian commerce
- Banned or prohibited.
Proposed Environmental Emergency Amendments – Explosive

- Boiling Liquid Expanding Vapour Explosive (BLEVE)
- Under pressure they can explode
- Decompose explosively
- This category still under investigation
## Proposed Environmental Emergency Amendments – Explosive

<table>
<thead>
<tr>
<th>CAS Number</th>
<th>Name of Substance</th>
<th>Threshold Quantity (Tonnes)</th>
<th>Concentration (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>100-42-5</td>
<td>Styrene</td>
<td>4.5</td>
<td>10</td>
</tr>
<tr>
<td>6484-52-2</td>
<td>Ammonium nitrate (in liquid form only)</td>
<td>20</td>
<td>81</td>
</tr>
<tr>
<td>6484-52-2</td>
<td>Ammonium nitrate (in solid form only)</td>
<td>20</td>
<td>60</td>
</tr>
</tbody>
</table>
Why styrene?

- Highly Flammable, Polymerizable, Peroxidizable Compound.
  - Involved in the worst industrial accident that happened in Canada, the runaway of a polystyrene reactor at the Monsanto plant in 1966 that caused 11 fatalities and 7 injuries.

- Involved in several industrial explosions caused by violent, exothermic polymerization

- Reference:
  - Lacoursière, J-P., RECOMMENDATION FOR INCLUDING STYRENE TO THE ENVIRONMENTAL EMERGENCY REGULATION LIST UNDER THE CANADIAN ENVIRONMENTAL PROTECTION ACT (1999), 2004
Taiwan, 2003 – Tank Truck BLEVE
Why Ammonium nitrate?

- Many accidents around the world:
  - Toulouse, Oklahoma City Security: easily usable for terrorists

- Ammonium nitrate is capable of detonating with the blast effect of about half that of explosives, if heated under confinement that permits high-pressure build-up or if subjected to strong shocks (NFPA Code 490, A.4.1.4)

- The sensitivity of ammonium nitrate to detonation is increased by elevated temperatures or by contamination (NFPA Code 490, A.4.1.4)

- Capable of releasing toxic fumes during fire

- Reference: See document:
  - Robert Reiss, RECOMMANDATION POUR INCLURE LE NITRATE D’AMMONIUM DANS LA LISTE DU RÈGLEMENT SUR LES URGENCES ENVIRONNEMENTALES D’ENVIRONNEMENT CANADA, CRAIM, 2004
Ammonium Nitrate

Fire in a Farm Supply Store
St-Romain (France) 2003/10/02

- 3-5 t AN
- Fire involving plastic container and AN
- 26 casualties including 18 firemen (3 of which suffered injuries compromising life), 3 policemen and 5 civilians
- 82 houses suffered structural damage of varying severity

Crisis management Control room installed in townhouse
4 helicopters used
Fire hydrant
Advanced medical teams
Evacuation means (12 vehicles)
Fire engine destroyed
Metallic Beam element missiles found up to 500 m
Fire in a Farm Supply Store
St-Romain (France) 2003/10/02

View of the building before the accident
Fire in a Farm Supply Store
St-Romain (France) 2003/10/02

View of building in ruins after the explosion
Proposed Environmental Emergency Amendments – Inhalation

- Greater than or equal to a vapour pressure of 10 mmHg
- Chemicals potential to become airborne and disperse
- Immediately Dangerous to Life and Health
  - Escape time of 30 minutes
  - Vapours potential to obstruct eyesight
- Emergency Response Planning Guidelines II
## Proposed Environmental Emergency Amendments – Inhalation

<table>
<thead>
<tr>
<th>CAS Number</th>
<th>Name of Substance</th>
<th>Threshold Quantity (Tonnes)</th>
<th>Concentration (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>64-19-7</td>
<td>Acetic acid</td>
<td>6.8</td>
<td>95</td>
</tr>
<tr>
<td>75-09-2</td>
<td>Dichloromethane</td>
<td>9.1</td>
<td>1</td>
</tr>
<tr>
<td>2551-62-4</td>
<td>Sulphur hexafluoride</td>
<td>9.1</td>
<td>10</td>
</tr>
</tbody>
</table>
Proposed Environmental Emergency Amendments – Aquatic/Carcinogenic

- Carcinogenic
  - Persistent for at least 5 years
  - Carcinogenic to humans or wildlife
- Cause harm to aquatic life (fish)
  - Persistent and toxic
  - Bioaccumulative and toxic
  - Persistent and Bioaccumulative and toxic
# Proposed Environmental Emergency Amendments – Aquatic/Carcinogenic

<table>
<thead>
<tr>
<th>CAS Number</th>
<th>Name of Substance</th>
<th>Threshold Quantity (Tonnes)</th>
<th>Concentration (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>56-23-5</td>
<td>Carbon tetrachloride (Tetrachloromethane)</td>
<td>0.22</td>
<td>1</td>
</tr>
<tr>
<td>79-01-6</td>
<td>Trichloroethylene</td>
<td>1.13</td>
<td>1</td>
</tr>
<tr>
<td>91-20-3</td>
<td>Naphthalene (in liquid form only)</td>
<td>4.5</td>
<td>10</td>
</tr>
<tr>
<td>91-94-1</td>
<td>3,3’-dichlorobenzidine</td>
<td>1.13</td>
<td>1</td>
</tr>
</tbody>
</table>
## Proposed Environmental Emergency Amendments – Aquatic/Carcinogenic

<table>
<thead>
<tr>
<th>CAS Number</th>
<th>Name of Substance</th>
<th>Threshold Quantity (Tonnes)</th>
<th>Concentration (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>117-81-7</td>
<td>Bis(2-ethylhexyl) phthalate (DEHP)</td>
<td>0.22</td>
<td>1</td>
</tr>
<tr>
<td>127-18-4</td>
<td>Tetrachloroethylene (Perchloroethylene, Perc)</td>
<td>1.13</td>
<td>1</td>
</tr>
<tr>
<td>373-02-4</td>
<td>Nickel acetate</td>
<td>0.22</td>
<td>10</td>
</tr>
<tr>
<td>1303-28-2</td>
<td>Arsenic pentoxide</td>
<td>0.22</td>
<td>10</td>
</tr>
<tr>
<td>1306-19-0</td>
<td>Cadmium oxide</td>
<td>0.22</td>
<td>10</td>
</tr>
</tbody>
</table>
## Proposed Environmental Emergency Amendments – Aquatic/Carcinogenic

<table>
<thead>
<tr>
<th>CAS Number</th>
<th>Name of Substance</th>
<th>Threshold Quantity (Tonnes)</th>
<th>Concentration (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1306-23-6</td>
<td>Cadmium sulphide (Cadmium sulfide)</td>
<td>0.22</td>
<td>10</td>
</tr>
<tr>
<td>1313-99-1</td>
<td>Nickel oxide</td>
<td>0.22</td>
<td>10</td>
</tr>
<tr>
<td>1327-53-3</td>
<td>Arsenic trioxide (Arsenic(III) oxide)</td>
<td>0.22</td>
<td>10</td>
</tr>
<tr>
<td>3333-67-3</td>
<td>Nickel carbonate</td>
<td>0.22</td>
<td>10</td>
</tr>
<tr>
<td>7440-38-2</td>
<td>Arsenic</td>
<td>0.22</td>
<td>10</td>
</tr>
</tbody>
</table>
## Proposed Environmental Emergency Amendments – Aquatic/Carcinogenic

<table>
<thead>
<tr>
<th>CAS Number</th>
<th>Name of Substance</th>
<th>Threshold Quantity (Tonnes)</th>
<th>Concentration (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>7718-54-9</td>
<td>Nickel chloride</td>
<td>0.22</td>
<td>10</td>
</tr>
<tr>
<td>7775-11-3</td>
<td>Sodium chromate</td>
<td>0.22</td>
<td>10</td>
</tr>
<tr>
<td>7778-39-4</td>
<td>Arsenic acid</td>
<td>0.22</td>
<td>10</td>
</tr>
<tr>
<td>7778-43-0</td>
<td>Sodium arsenate</td>
<td>0.22</td>
<td>10</td>
</tr>
<tr>
<td>10048-95-0</td>
<td>Sodium arsenate</td>
<td>0.22</td>
<td>10</td>
</tr>
<tr>
<td>7784-46-5</td>
<td>Sodium arsenite</td>
<td>0.22</td>
<td>10</td>
</tr>
<tr>
<td>CAS Number</td>
<td>Name of Substance</td>
<td>Threshold Quantity (Tonnes)</td>
<td>Concentration (%)</td>
</tr>
<tr>
<td>------------------</td>
<td>----------------------------</td>
<td>-----------------------------</td>
<td>-------------------</td>
</tr>
<tr>
<td>7786-81-4; 10101-97-0</td>
<td>Nickel sulphate</td>
<td>0.22</td>
<td>10</td>
</tr>
<tr>
<td>7789-00-6</td>
<td>Potassium chromate</td>
<td>0.22</td>
<td>10</td>
</tr>
<tr>
<td>7738-94-5; 1333-82-0</td>
<td>Chromic acid (Chromium trioxide)</td>
<td>0.22</td>
<td>10</td>
</tr>
<tr>
<td>10108-64-2</td>
<td>Cadmium chloride</td>
<td>0.22</td>
<td>10</td>
</tr>
</tbody>
</table>
## Proposed Environmental Emergency Amendments – Aquatic/Carcinogenic

<table>
<thead>
<tr>
<th>CAS Number</th>
<th>Name of Substance</th>
<th>Threshold Quantity (Tonnes)</th>
<th>Concentration (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>10124-36-4</td>
<td>Cadmium sulphate (Cadmium sulfate)</td>
<td>0.22</td>
<td>10</td>
</tr>
<tr>
<td>10588-01-9</td>
<td>Sodium dichromate</td>
<td>0.22</td>
<td>10</td>
</tr>
<tr>
<td>13138-45-9</td>
<td>Nickel nitrate</td>
<td>0.22</td>
<td>10</td>
</tr>
<tr>
<td>13478-00-7</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15699-18-0</td>
<td>Nickel ammonium sulphate (Nickel ammonium sulfate)</td>
<td>0.22</td>
<td>10</td>
</tr>
</tbody>
</table>
## Proposed Environmental Emergency Amendments – Aquatic/Carcinogenic

<table>
<thead>
<tr>
<th>CAS Number</th>
<th>Name of Substance</th>
<th>Threshold Quantity (Tonnes)</th>
<th>Concentration (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>81741-28-8</td>
<td>Tributyl tetradecyl phosphonium chloride (TTPC)</td>
<td>0.22</td>
<td>10</td>
</tr>
<tr>
<td>25154-52-3</td>
<td>Nonylphenol</td>
<td>1.13</td>
<td>10</td>
</tr>
<tr>
<td>104-40-5</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>84852-15-3</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Timelines for Amendments to the E2 Regulations

- Initial stakeholder consultations began in July 2005

- Publication in *Canada Gazette Part 1* targeted for Winter 2006

- Publication in *Canada Gazette Part 2* likely by Summer 2007

- Revise Implementation Guidelines for re-publication by Summer 2007
Conclusion

- Completes our analysis of some 97 individual substances found within classes or unique compounds on the “Toxic Substances” list
  - 2 substances are added to Part 1 – Explosive
  - 3 substances are added to Part 2 – Inhalation
  - 29 substances are added to Part 3 – Aquatic / Carcinogenic
Want to know more?

For further information:

- *Canada Gazette Part II* publication: [http://canadagazette.gc.ca](http://canadagazette.gc.ca)
- CEPA Registry [www.ec.gc.ca/CEPAREgistry](http://www.ec.gc.ca/CEPAREgistry)
- Environmental Emergencies Division Website [www.ec.gc.ca/ee-ue/](http://www.ec.gc.ca/ee-ue/)
- E2 Regulations on-line notification system [https://cepa2-lcpeue.ec.gc.ca/](https://cepa2-lcpeue.ec.gc.ca/)

Or contact:

- Environment Canada’s Environmental Emergencies Program at [CEPAE2@ec.gc.ca](mailto:CEPAE2@ec.gc.ca)