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Canada



Code of Practice for the Reduction of Volatile Organic Compound (VOC) Emissions from Cutback and Emulsified Asphalt

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Overview of Presentation

- Air Quality Issues
- Asphalt use in Canada
- Code of Practice
- Important Dates

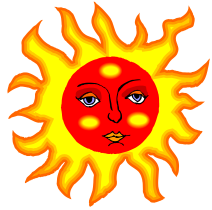


Air Quality Issues

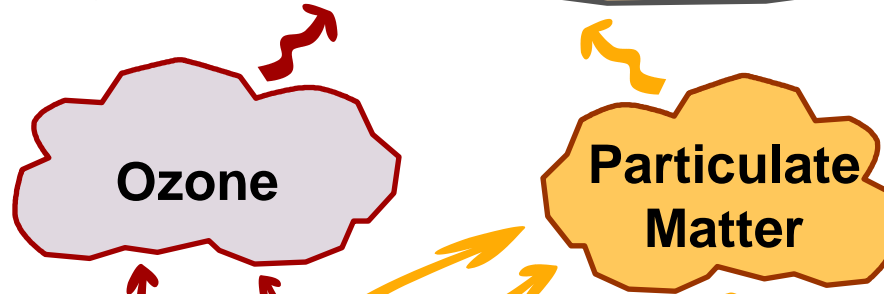
- 2003: VOCs added to Canadian Environmental Protection Act, 1999 (CEPA) List of Toxic Substances, given contribution to formation of ground-level ozone and particulate matter (PM), the two main components of smog
- Both PM and ozone have targets but are considered to be having no safe level
- Serious health and environmental concerns posed by smog, including:
 - premature deaths
 - increased risk of lung cancer and heart disease
 - reduced growth and survivability of tree seedlings
 - increased plant susceptibility to environmental stresses



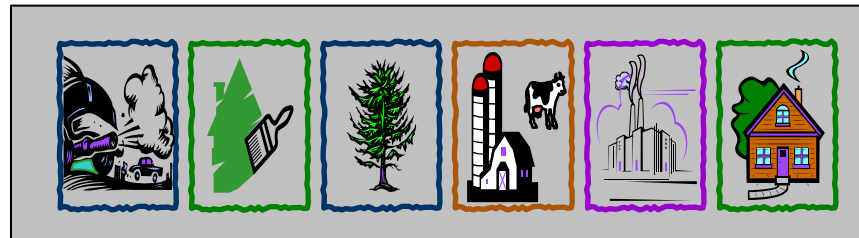
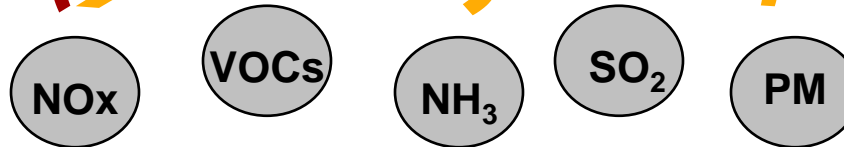
How is smog formed?



**Primary
Pollutants**



**Pollutants
and
sources**



Definitions

- **Cutback Asphalt (CA):** produced by mixing asphalt cement with a petroleum diluent
 - Generates higher VOC emissions
 - Classified into three groups depending on the relative speed of evaporation of the petroleum diluent:
 - rapid curing
 - medium curing
 - slow curing
- **Emulsified Asphalt (EA):** produced by emulsifying asphalt cement in water with an emulsifying agent, such as soap (and sometimes a small amount of petroleum solvent)
 - Generates lower VOC emissions
 - The emulsion setting rate determines the four grades for EA:
 - rapid setting
 - medium setting
 - slow setting
 - quick setting



Why Target Asphalt?

- 2009: Environment and Climate Change Canada (ECCC) end-user survey estimated asphalt use and emissions in Canada:

	Quantity used (kt)	Quantity used (%)	VOC emission (kt)	VOC emission (%)
Cutback asphalt (CA)	45	15%	5.2	59%
Emulsified asphalt (EA)	256	85%	3.6	41%

- Cutback asphalt contributes disproportionately to the VOC emissions in this sector
- Possible reduction of 5 kilotonnes of VOC emissions through the use of EA instead of CA (product comparable in price and in quality)



Selection of a Code of Practice

- 2012: ECCC consultations on development of control instruments for VOCs emissions from asphalt
- **Code of practice:** voluntary instrument that identifies recommended procedures or practices to help a sector prevent, control or eliminate emissions
- Preferred option because:
 - encourages reduction of VOCs, while allowing flexibility
- Additionally, could be:
 - developed more expediently
 - used by industry and associations to set standards and encourage better practices
 - cited by all levels of government and other parties in procurement and contract specifications



Publication of the Final Code

- February 25, 2017: publication of the final Code of Practice for the Reduction of Volatile Organic Compound (VOC) Emissions from Cutback and Emulsified Asphalt in Canada Gazette, Part I. (<http://www.ec.gc.ca/lcpe-cepa/default.asp?lang=En&n=BBD8AD11-1>)
- **Objective:** to protect environment and health of Canadians, while maintaining road safety, by recommending best practices that encourage the use of low VOC emitting asphalt



Applicability

- The Code applies to any person involved in the manufacture, import, offer for sale, sale or use of cutback asphalt or emulsified asphalt, including:
 - manufacturers and distributors
 - procurement enablers
 - end-users (paving companies)



Recommended Practices

When used in paving material, the following maximum VOC concentrations are recommended (% by volume):

	Cutback asphalt	Emulsified asphalt
During ozone season (May-September)	0.5%	3.0%
Outside ozone season (October-April)	5.0%	No recommendations



Recommended Practices (cont'd)

- **Low-emitting VOC product alternatives**
 - recommends the manufacture, import, sale or use of low VOC emitting product alternatives instead of cutback asphalt with petroleum solvent formulations
- **Labelling**
 - technical specification sheets that accompanies the product should be included, with seasonal recommendations on product use
 - technical specification sheets should reference the Code



Recommended Practices (cont'd)

- **Contracting**

- commitment to follow the Code should be included in contracts
- use of alternative formulations of asphalt containing low VOC emitting products should be promoted during contracting discussions

- **Conditions of use and training of staff**

- persons conducting paving or maintenance operations should conduct their activities in accordance with the Code
- employees should be trained on recommended practices of the Code and record keeping procedures



Reporting

- **Manufacturers** should submit reports every two years
- Reports should contain product name, type of asphalt, quantity manufactured/sold, and VOC quantity
- First report should be submitted by March 31, 2018 for 2017 calendar year's activities



Record Keeping

- **Manufacturers**
 - Should keep records of the quantity and grade of all asphalt manufactured and sold for that year for a minimum of six years
- **Procurement enablers**
 - Should keep a copy of contracts for a minimum of six years
- **End-users**
 - Should keep records of the quantity and type of asphalt product used for each year for a minimum of six years



Promotion of the Code of Practice

- ECCC will promote the Code by:
 - Communicating the availability of the Code of Practice to our list of stakeholders:
 - Associations
 - Indigenous People
 - Provinces and Municipalities
 - Developing and distributing FAQ sheets
 - Communicating with Associations about potential promotion of the Code
 - Presentations at industry conferences and meetings
 - Reminding Manufacturers to complete and submit their reporting



Important Dates

- Code of Practice for the Reduction of Volatile Organic Compound (VOC) Emissions from Cutback and Emulsified Asphalt published on February 25, 2017
- Code recommends best practices with an emphasis on use during ozone season (May 1 - September 30)
- Manufacturers should submit their first report by March 31, 2018
- The implementation of the Code will be reviewed six years after publication (2023)





Questions?

Products Division

Environment and Climate Change Canada

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For more information please visit :

<https://www.canada.ca/en/environment-climate-change/services/managing-pollution/sources-industry/volatile-organic-compounds-consumer-commercial/cutback-asphalt-emulsified.html>



Annex 1 : Estimated VOC emission factors for asphalt products

- Different types of asphalt products are associated with different emission factors of VOCs.

Emission Factors for Product Groupings	
Product Group	Emission Factor¹
Cutback Asphalt	
Slow cure	3.5%
Medium cure	15%
Rapid cure	28%
Emulsified Asphalt	
Low or no VOC emulsions	0.5%
High float surface treatment emulsions	1.5%
High float mixing grade emulsions	3.0%

1. Volatility w/w assumed in percent



Annex 2: Reducing VOC's in Canada – Asphalt Sector

