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# The National Pollutant Release Inventory (NPRI) Program Information session

**March 3, 2016**

# Agenda

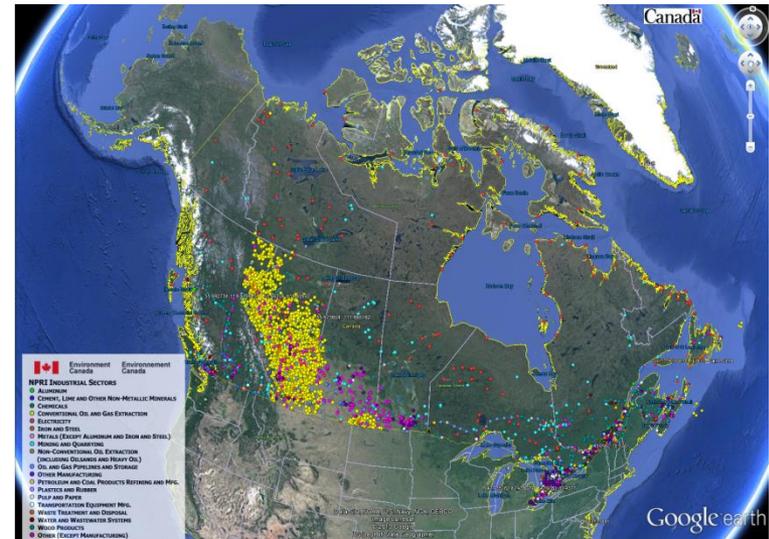
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- Welcome and Introductions
- Overview of the NPRI
- General Reporting Requirements and Estimation Methods
- Compliance promotion, Guidance and enforcement
- Helpdesk
- Quality Control



# About the National Pollutant Release Inventory (NPRI)

- Established in 1993, the NPRI is Canada's legislated, publicly-accessible inventory of pollutant releases (to air, water and land), disposals (e.g., underground injection, landfill) and transfers for recycling.
- NPRI includes information collected from approximately 7,500 facilities on over 300 substances, based on mandatory annual reporting under the *Canadian Environmental Protection Act, 1999*
- Reporting on "CEPA-Toxic" substances, air pollutants contributing to smog and acid rain, and other pollutants of concern



# Why the NPRI Exists

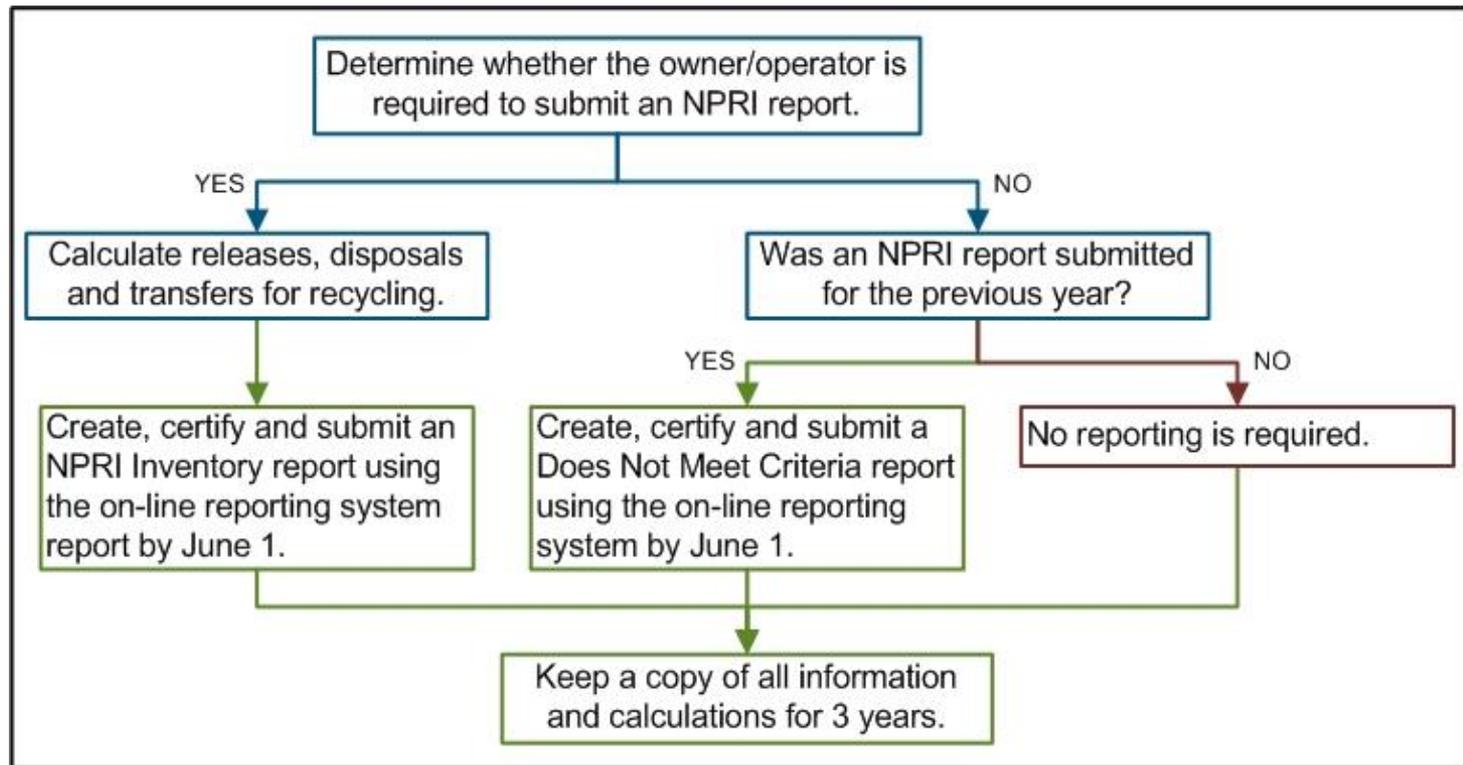
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- The NPRI is a key resource for identifying and monitoring sources of pollution in Canada. It exists to:
  - Identify pollution prevention priorities;
  - Support the assessment and risk management of chemicals and air quality modelling;
  - Help develop targeted regulations for reducing releases of toxic substances and air pollutants;
  - Encourage actions to reduce the release of pollutants into the environment; and
  - Improve public understanding
- The NPRI data is published on the ECCC website and is used by governments, academia, industry, non-government and international organizations and media, among others.

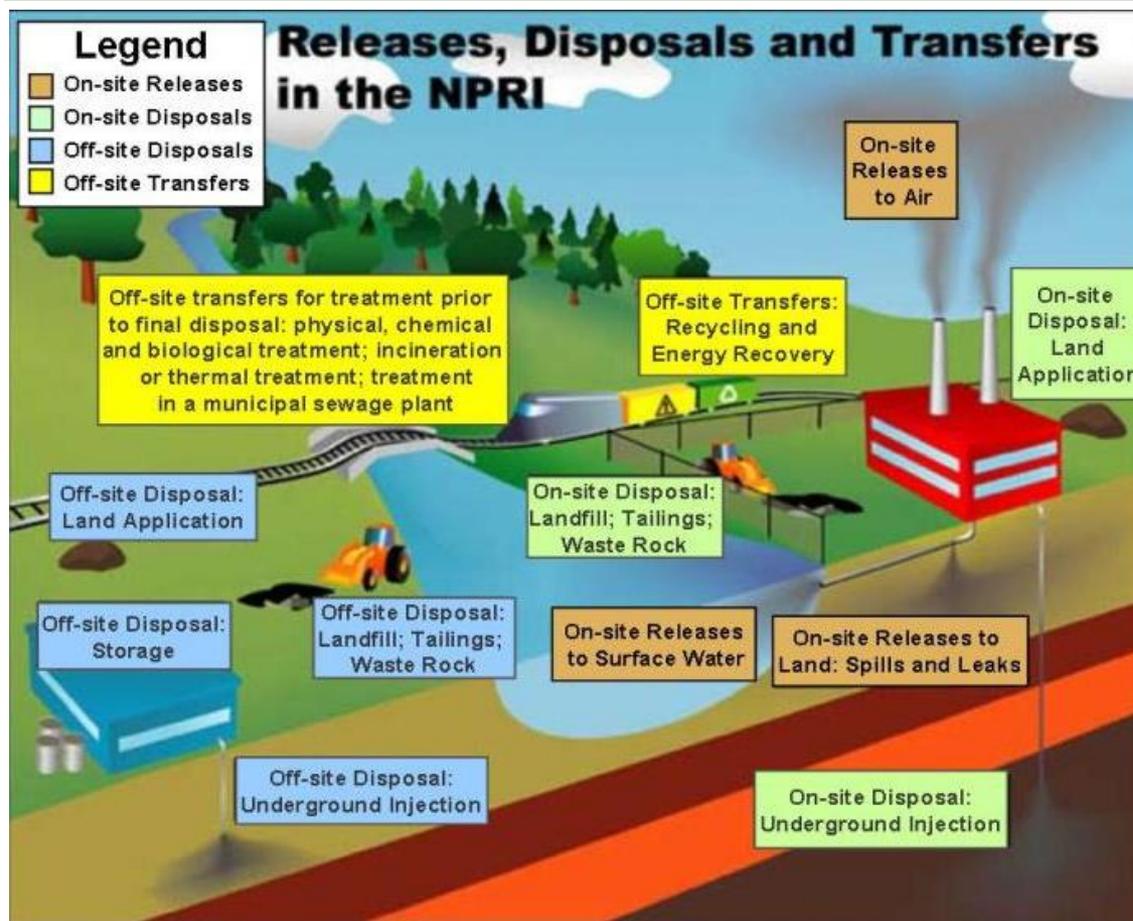


# Process for Reporting to the National Pollutant Release Inventory

The deadline for reporting to the NPRI for the 2015 calendar year is June 1, 2016.



# What is Reported to the NPRI?



## Quantities

**Releases:** air, surface water, land

**Disposals (on- or off-site):** landfill, land application, tailings & waste rock, underground injection

**Transfers (off-site):** treatment, recycling or energy recovery (including the destination of the transfer)

## Other information

**Facility information:** location, industry type, contacts

**Type of use:** e.g. for sale, by-product; additive

## **Pollution Prevention**

**Reasons for changes**

# Basic Reporting Requirements

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- Facilities are subject to the requirements if they:
  - Have a certain number of employees (10 FTEs / 20 000 hours); or
  - Carry out certain specified activities
- Individual substances may be reportable if:
  - Thresholds are exceeded for:
    - Quantity manufactured, processed or otherwise used
    - Quantity released (for air pollutants)
  - Certain activities occur (e.g. dioxins/furans and hexachlorobenzene)



# Calculating employee threshold

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## Consider:

- all hours worked by individuals employed at the facility, including students, part-time and term employees;
- all hours worked by the owner(s) who performed work on-site at the facility;
- all hours worked by a person, such as a contractor, who performed work at the facility that is related to the operations of the facility; and
- all paid vacation and sick leave.



# Activities to Which the Employee Threshold Does Not Apply

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- Non-hazardous solid waste incineration of  $\geq 26$  tonnes of waste, including, but not limited to, conical burners and beehive burners
- Biomedical or hospital waste incineration of  $\geq 26$  tonnes of waste
- Hazardous waste incineration
- Sewage sludge incineration
- Wood preservation (using heat or pressure treatment, or both)
- Terminal operations
- Discharge of treated or untreated wastewater from a wastewater collection system discharging an average of  $\geq 10\,000\text{ m}^3/\text{day}$  into surface waters
- Operations at pits or quarries where production is  $\geq 500\,000$  tonnes



# Manufacture, Process or Otherwise Use (MPO) definition

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**Manufacture:** to produce, prepare or compound an NPRI substance, including coincidental production of an NPRI substance as a by-product resulting from the manufacturing, processing or otherwise use of other substances

**Process:** the preparation of an NPRI substance, after its manufacture, for distribution in commerce, with or without changes in physical state or chemical form

**Otherwise Use:** encompasses any use, disposal, or release of an NPRI substance that does not fall under the definitions of “manufacture” or “process”



# Reporting thresholds

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Substances are listed in parts, each with unique reporting criteria. Some substances (i.e., benzene) are included under multiple parts

- **Part 1A – Core Substances** [10-tonne manufactured, processed or otherwise used (MPO), at  $\geq 1\%$  (no concentration threshold for by-products)]
  - Examples: Copper (and its compounds), zinc (and its compounds), manganese (and its compounds), ethylene glycol, ethylbenzene, methanol, phosphorus, ammonia, nitrate ions, hydrogen sulphide, hydrochloric and sulphuric acids
- **Part 1B – Alternate Threshold substances** [MPO, with lower mass and/or concentration thresholds]
  - Examples: Mercury (5 kg), Arsenic, lead (50 kg), Bisphenol A, selenium and its compounds, thallium and its compounds (100 kg)



# Reporting thresholds

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- **Part 2 – Polycyclic Aromatic Hydrocarbons (PAHs)** [50 kg released, disposed or recycled for group, 5 kg for individual reporting]
- **Part 3 – Dioxins, Furans & Hexachlorobenzene** [specified activities]
- **Part 4 – Criteria Air Contaminants (CACs)** [quantity released to air]
  - Sulphur dioxide, carbon monoxide, nitrogen oxides (NO<sub>x</sub>), volatile organic compounds (VOCs), total particulate matter, PM<sub>2.5</sub>, PM<sub>10</sub>
- **Part 5 – Individual Volatile Organic Compounds (VOCs)** [1 tonne released to air, if Part 4 criteria for Total VOCs is met]
  - Examples: Benzene, creosote, ethylene, formaldehyde, octane, propane, styrene, xylene



# Example MPO Threshold Calculation for a Part 1B substance

<b>Material Containing Cadmium (Cd)</b>	<b>Total Weight of Material Containing Cd</b>	<b>Concentration Cd in the Material or Stream</b>	<b>Net Weight of Cd</b>
<b>Process stream 1</b>	<b>1,100 kg</b>	<b>0.40%</b>	<b>4.4 kg</b>
<b>Raw material in process 2</b>	<b>2,000 kg</b>	<b>0.05%</b>	<b>n/a</b>
<b>By-products released from process 3</b>	<b>1,000 kg</b>	<b>0.08%</b>	<b>0.8 kg</b>
		<b>Total Weight of Cd</b>	<b>5.2 kg</b>

An NPRI report is required for releases, disposals and recycling of Cd because the 5 kg threshold was exceeded.



# MPO quantities are not required to be reported to the NPRI

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- MPO quantities are used to determine whether the owner/operator is required to submit an NPRI report
- Quantities of Parts 1-3 substances that are released, disposed of and transferred off-site for recycling are required to be reported
- For Parts 4-5 substances only releases to air need to be reported

For more information and useful links on reporting to the NPRI:

<http://www.ec.gc.ca/inrp-npri/default.asp?lang=En&n=F6300E68-1>



# Release Estimation Methods

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- The five most widely recognized categories of release estimation techniques are:
  - direct monitoring
  - mass balance
  - chemical specific emission factors
  - engineering calculations
    - indirect monitoring
    - models
    - other calculations
    - non-chemical specific emission factors
  - engineering judgement (best guess with available data)
- Not all estimation methods are equally applicable to all pollutants, source types, or spatial and temporal scales



# NPRI Release Estimation Techniques – Direct Methods

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- Continuous emission monitoring systems
  - record emissions over an extended and uninterrupted period
  - concentration and flow rate are used to calculate annual emissions of the substance
- Predictive emission monitoring
  - correlation between substance emission rates and process parameters (e.g., fuel usage, steam production, furnace temperature)
  - a hybrid of continuous monitoring, emission factors and stack tests
- Source testing
  - involves determining the concentration of one or more substances in a sample of the emission of effluent
  - concentration is then multiplied by the volumetric flow rate to determine the quantity of the substance(s) emitted over time



# NPRI Release Estimation

## Techniques – Indirect Methods

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- Mass balance
  - applying the law of conservation of mass to a facility, process or piece of equipment
  - releases are determined from the differences in input, output, accumulation and depletion of a substance
- Site-specific and published emission factors
  - relating the quantity of substances emitted from a source to a common activity associated with those emissions
  - may be published or developed by facilities using emission testing data and source-activity information
- Engineering estimates
  - releases can be estimated from engineering principles and judgement by using knowledge of the chemical and physical processes involved, the design features of the source, and an understanding of the applicable physical and chemical laws



# Example of Release Estimation Technique – Mass Balance - Part 4 – Criteria Air Contaminants

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- A facility uses 230 litres per week of Varsol, so:
  - Quantity = 230 litres/week x 50 weeks/year  
= 11,500 litres/year
- The following information is from the MSDS:
  - Density = 0.70 kg/litre
  - Concentration = 95% = 0.95
- The total release of VOCs from Varsol use is:
  - Metric equivalent = 11,500 litres/year x 0.70 kg/litre x 0.95 x 1 tonne/1,000 kg = **7.65 tonnes/year**



# Summary of requirement changes for 2014-2015

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- **Substances Added to the NPRI Substance List**

- 2-(2-Methoxyethoxy)ethanol (CAS RN) 111-77-3) added to Part 1a
- Thallium (and its compounds) added to Part 1b

- **Reduced Thresholds**

- Eight substances or substance groups have been moved from Part 1a to Part 1b - mass threshold reduced, and in some cases the concentration reduced

- **Quinoline** – moved from Part 1a to Part 2 (Polycyclic Aromatic Hydrocarbons).

- **Deleted Substances** – Five substances have been removed from Part 1a

- Allyl chloride, C.I. Solvent Orange 7, 3-Chloro-2-methyl-1-propene, Ethyl chloroformate and 1-Bromo-2-chloroethane

- **Total Reduced Sulphur** – requirement to report only releases to air

- **Underground Releases** – includes both underground and surface releases and the reporting of additional details in Single Window

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# NPRI Toolbox

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- The 'NPRI Toolbox' is an online compilation of materials to assist reporters
- 'Tools' are: guidance material, emissions estimation calculators (spreadsheets), case studies and examples, step by step example calculations, questions and answers and links to applicable resources developed by other Pollutant Release Transfer Registers
- Content is separated into General tools and Sector-Specific tools and is currently being streamlined down to one webpage which links to all the content
- Emissions Estimation Calculators are available at the following link:

<https://www.ec.gc.ca/inrp-npri/default.asp?lang=En&n=65A75CDF-1>



# Compliance, Guidance & Enforcement

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- E-mails to known reporters at the launch of reporting and near the deadline
- Video tutorials on the Single Window on-line reporting system (included within above e-mails)
- Website
  - Frequently Asked Questions
  - Checklist for Reporting to the NPRI
  - NPRI helpdesk contact information
- Facilities that must report but do not or report late are in violation of CEPA
- Violations are dealt with under the *CEPA Compliance and Enforcement Policy*

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# Compliance, Guidance & Enforcement

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## Facility responsibilities:

- Report to the NPRI by June 1st
- Submit complete and accurate information
- Keep NPRI records for minimum 3 years
- Existing reporters must indicate if reporting criteria are no longer met (Does Not Meet Criteria through the Single Window online reporting system)
- Companies are to notify us of any changes in ownership, company name, address, or contact information through the Single Window online reporting system

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# Quality Control

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- Preliminary data is made available on the NPRI website soon after collection (approx. 1-month)
- Preliminary publication letter is sent to reporting facilities for the purposes of Quality Control
- Quality Control is a collaborative exercise (June to early September each year)
- Examples of Quality Control issues:
  - air release for a facility goes from 1 tonne in 2013 to 1,000 tonnes in 2014. Becomes highest emitter for their sector
  - Missing values (failure to report or to report a particular substance)
  - Incorrect units – reports 25 tonnes in 2013, then 0.0025 tonnes in 2014



# Helpdesk

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- Support via e-mail and telephone:
  - Tel: 1-877-877-8375
  - E-mail: [ec.inrp-npri.ec@canada.ca](mailto:ec.inrp-npri.ec@canada.ca)
- Technical questions, Single Window on-line reporting questions, etc.
- Access requests
- Response time within 3 days...usually respond within same day

