



Environment and  
Climate Change Canada

Environnement et  
Changement climatique Canada

Canada



# Canadian Experiences with Improving Quality of Pollutant Release Data, and Trends in Reported Data

**TRI National Conference**

**Washington, D.C.**

**Oct. 20, 2016**

**Session: TRI Data Quality Practices**

**Jody Rosenberger**

**Science & Technology Branch**

# Contents

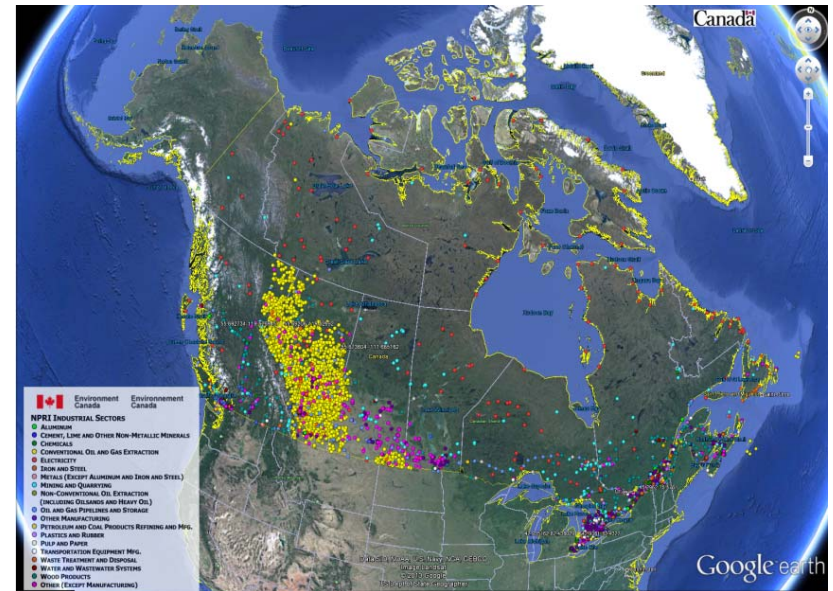
---

- What is NPRI?
- Data Quality – not just accuracy of reported data
- Examples of Efforts to Improve Data Quality
  - Quality Assurance
  - Quality Control
  - Facility Location Quality Control
  - Data Visualization Tools
- Trends in Pollutant Releases

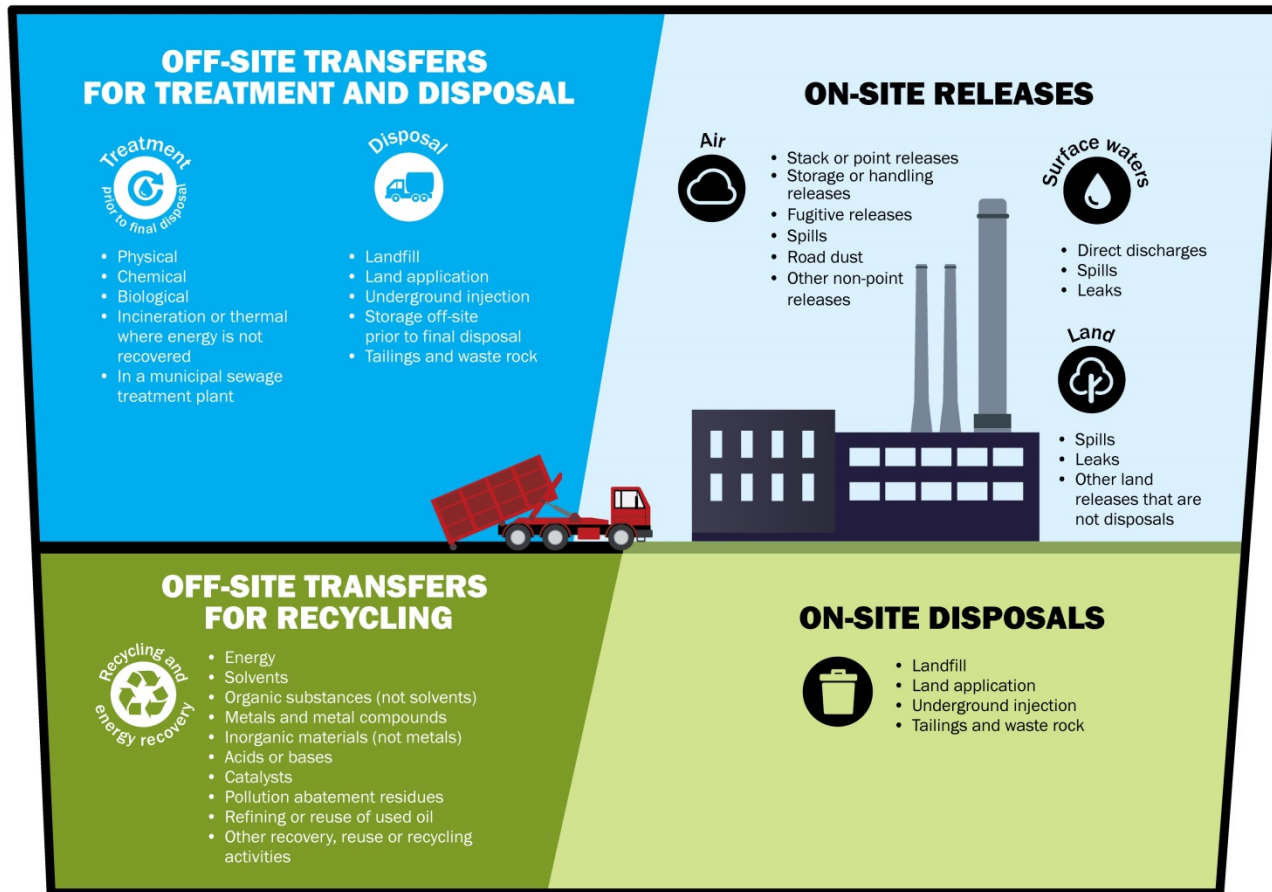


# About the National Pollutant Release Inventory (NPRI)

- Established in 1993, the NPRI is Canada's legislated, publicly-accessible inventory of pollutant releases (to air, water and land), disposals and off-site 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*
- NPRI data are used by governments (federal, provincial, municipal), academia, industry, non-governmental organizations, international organizations, financial institutions and media



# What is Reported to the NPRI?



## Quantities

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

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

**Transfers (off-site):** Disposal, Treatment, Recycling or Energy Recovery (including destination)

## Other information

**Facility information:** location, NAICS, contacts

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

**Pollution Prevention**

**Reasons for changes**

**Comments**



# Data Quality – more than just accuracy

NPRI views “data quality” in a broad sense, encompassing six dimensions.

Overall objective is to ensure that the data meets the needs of users.



Page 5 – October 20, 2016 – US TRI Conference



# The NPRI Data Quality Management Framework



- The primary objective of the NPRI Data Quality Management Framework is to ensure that NPRI data achieves and maintains a high level of quality and meets the needs of data users
- Ongoing activities are related to each of the following dimensions of data quality:
  - **Relevance** → Stakeholder & data user consultation; Review of the NPRI Substances List
  - **Accuracy/reliability** → Annual QA/QC process (sectoral engagement); Uncertainty analyses; Tools
  - **Completeness** → Sector and Substance Coverage Analysis; Compliance Promotion
  - **Understandability** → Guide for using and interpreting NPRI data; FAQs; Contextual information
  - **Accessibility** → NPRI data available in a variety of formats (database structure improvement)
  - **Timeliness** → Annual publication of NPRI data (preliminary and reviewed)
- As the NPRI program continues to evolve, these activities are adjusted to address new challenges and opportunities for continuous improvement
- Available at: <http://www.ec.gc.ca/inrp-npri/default.asp?lang=En&n=23EAF55A-1>



# NPRI Requirements Related to Data Quality

- Estimation methods that may be used:
  - Direct measurements
  - Mass balance calculations
  - Emission factors
  - Engineering estimates
- If monitoring or measurement is required under other legislation or by-laws, facilities must use that information when completing their NPRI report
- Information must be reported if the owner/operator of a facility possesses the information or may reasonably be expected to have access to the information



Page 7 – October 20, 2016 – US TRI Conference



Environment and  
Climate Change Canada

Environnement et  
Changement climatique Canada

Canada

# Quality Assurance Activities

---

- Guidance and tools to assist reporting facilities (NPRI Toolbox)
- Work with individual sectors to improve guidance and consistency
- Online reporting system (automated checks)
- Compliance promotion activities



**WARNING:** If you are undertaking “hazardous waste incineration”, you must report for dioxins and furans





# Quality Control of Reported Data

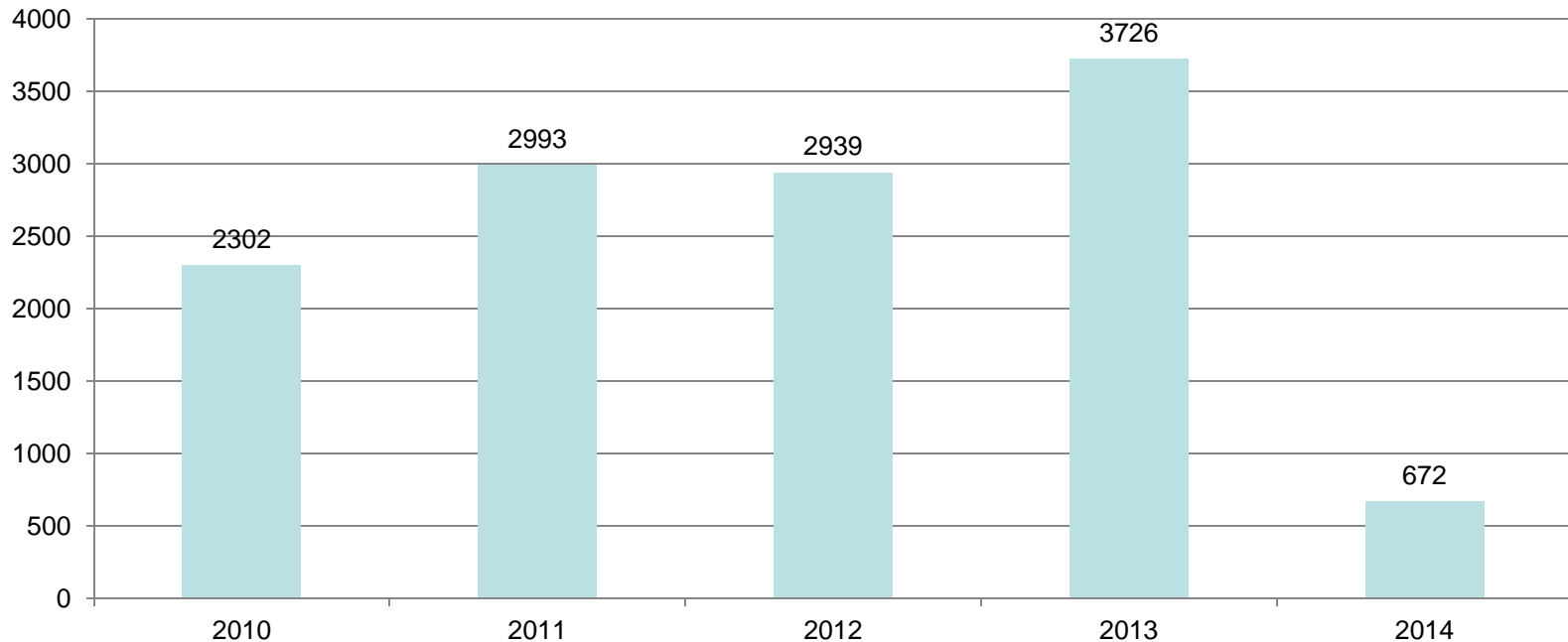
---

- NPRI staff analyze latest release and transfer data to identify potential reporting errors and unusual trends. Special attention is paid to comments provided by facilities to explain changes.
- Data for specific media and/or sectors distributed to other ECCC staff (e.g., air inventory and sector groups), and others such as industry associations, for analysis.
- Potential QC issues are identified by various parties and compiled by NPRI staff.
- Issues are prioritized, with High priority issues addressed before mid-September (data lock-down for analysis and publication).



# Example 1: Is this a reporting error?

**On-Site Releases of PM10 to Air (tonnes)**

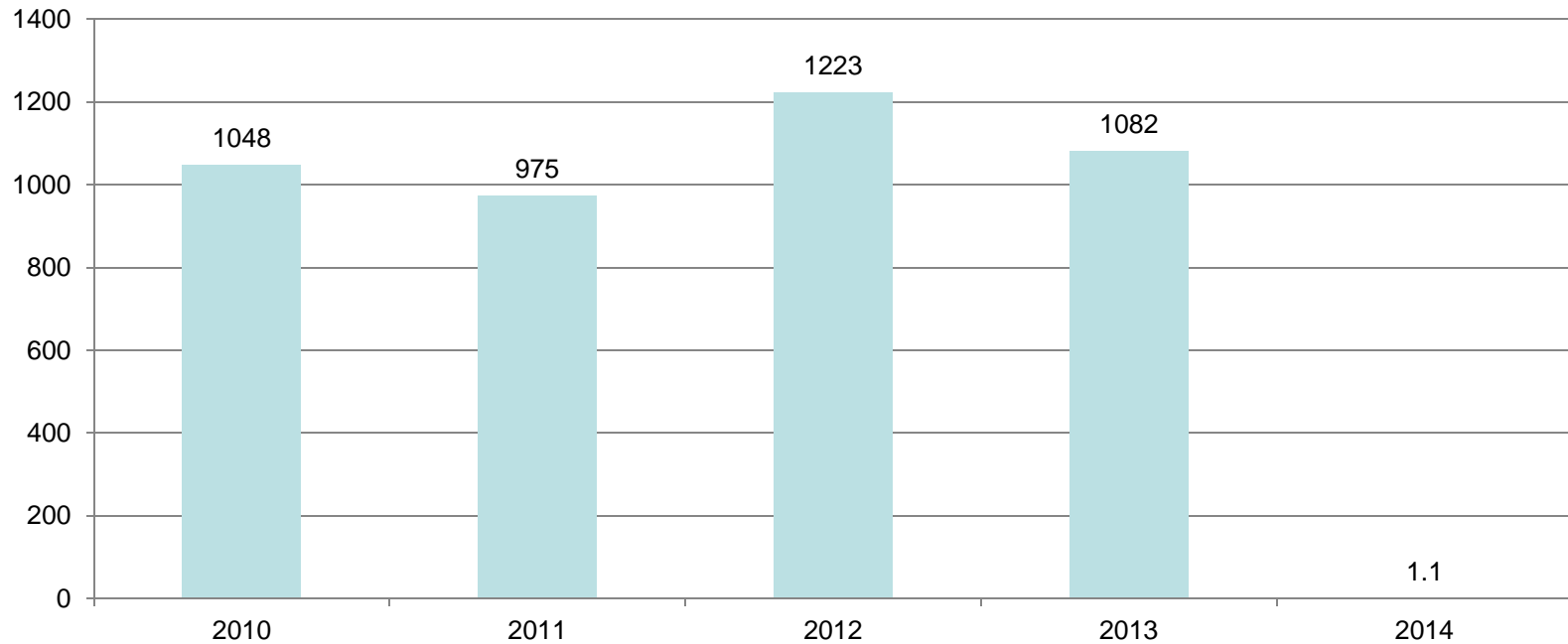


- No – after contact with facility, confirmed as an actual decrease due to decreased production.



# Example 2: Is this a reporting error?

On-Site Releases of Arsenic to Air (kg)

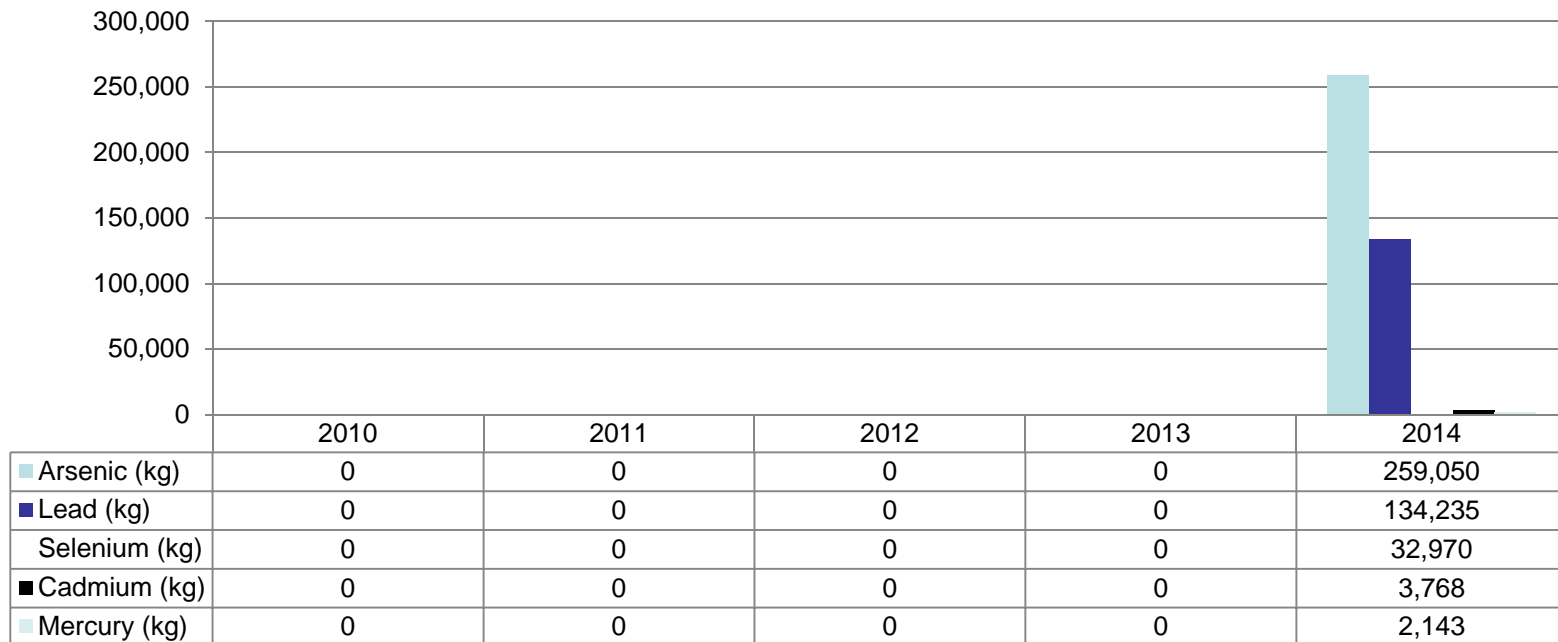


- Yes – this was confirmed as a unit error, which was subsequently corrected.



# Example 3: Is this a reporting error?

On-Site Releases to Water (kg)

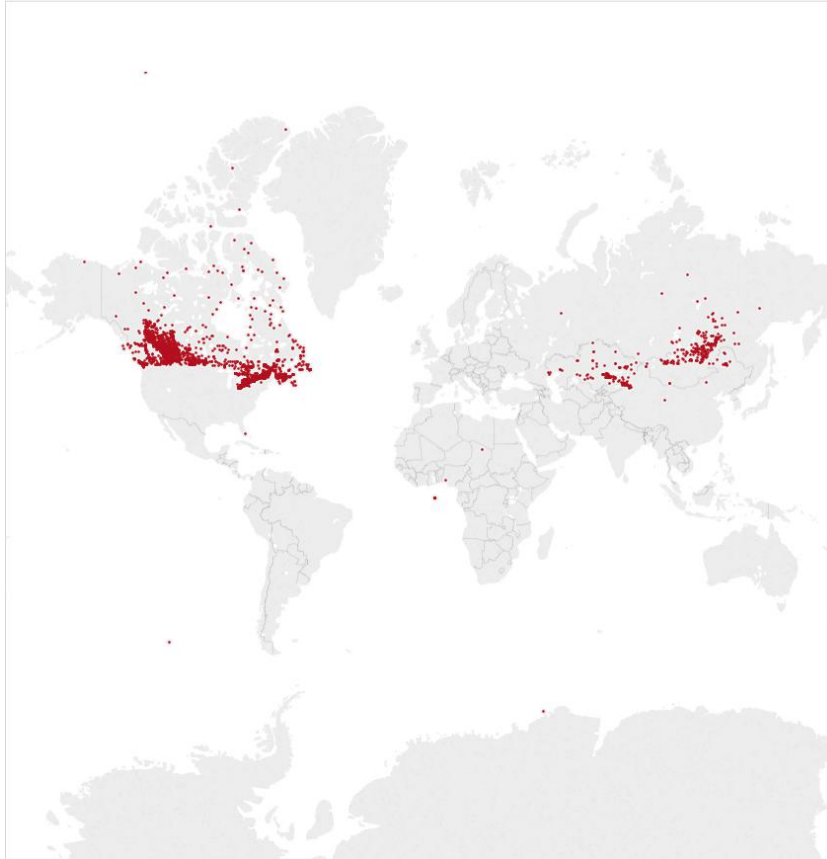


- No – the new/large reporting of releases to water was due to a tailings impoundment breach during 2014.

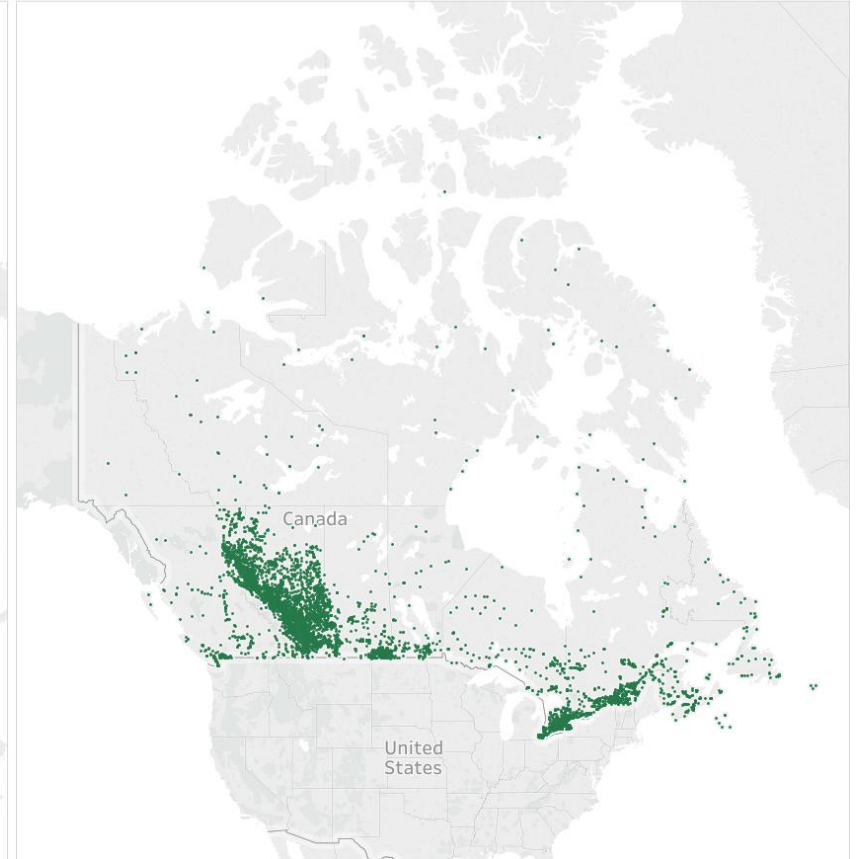


# Facility Location Quality Control

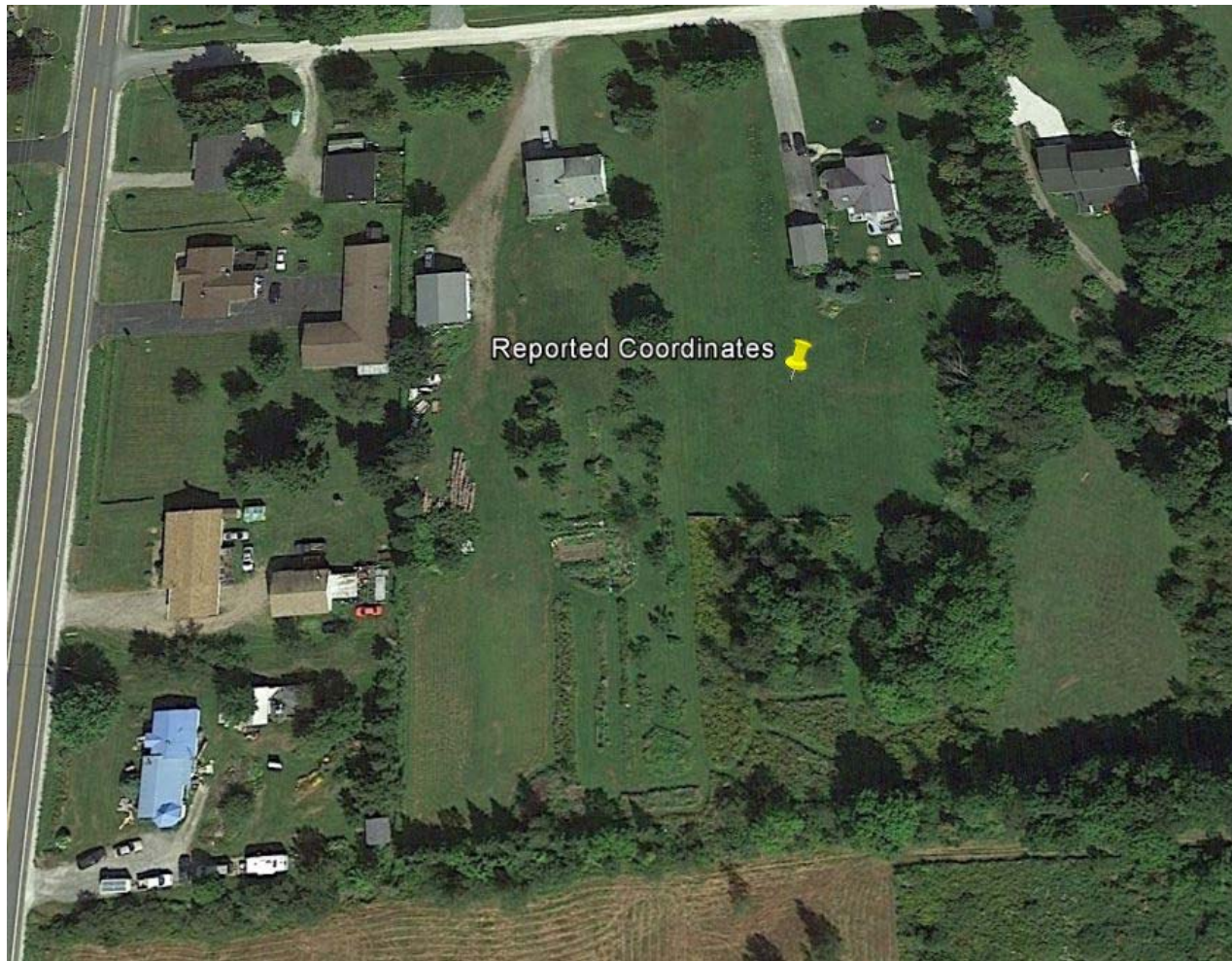
Reported Coordinates



Corrected Coordinates



# Facility Location Quality Control



Page 14 – October 20, 2016 – US TRI Conference



Environment and  
Climate Change Canada

Environnement et  
Changement climatique Canada

Canada

# Facility Location Quality Control



Page 15 – October 20, 2016 – US TRI Conference

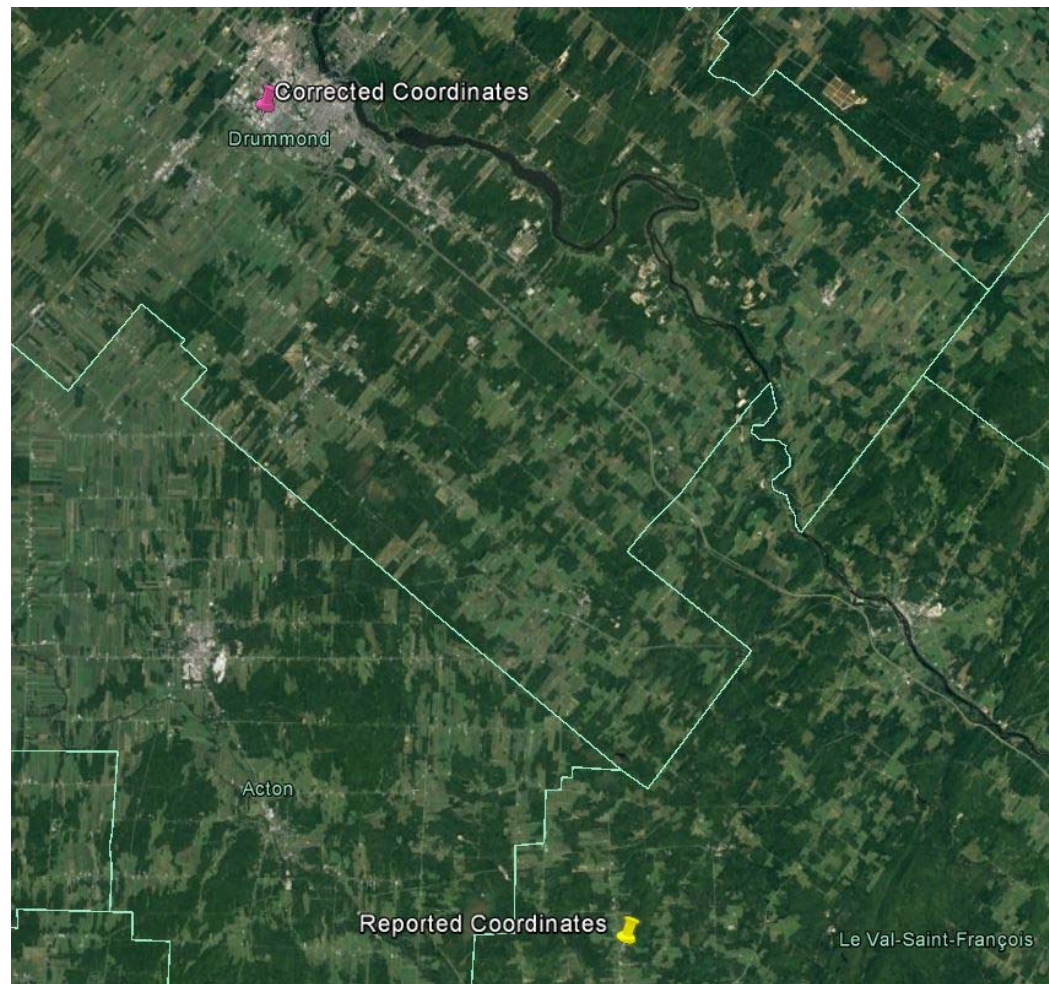


Environment and  
Climate Change Canada

Environnement et  
Changement climatique Canada

Canada

# Facility Location Quality Control



Page 16 – October 20, 2016 – US TRI Conference



Environment and  
Climate Change Canada

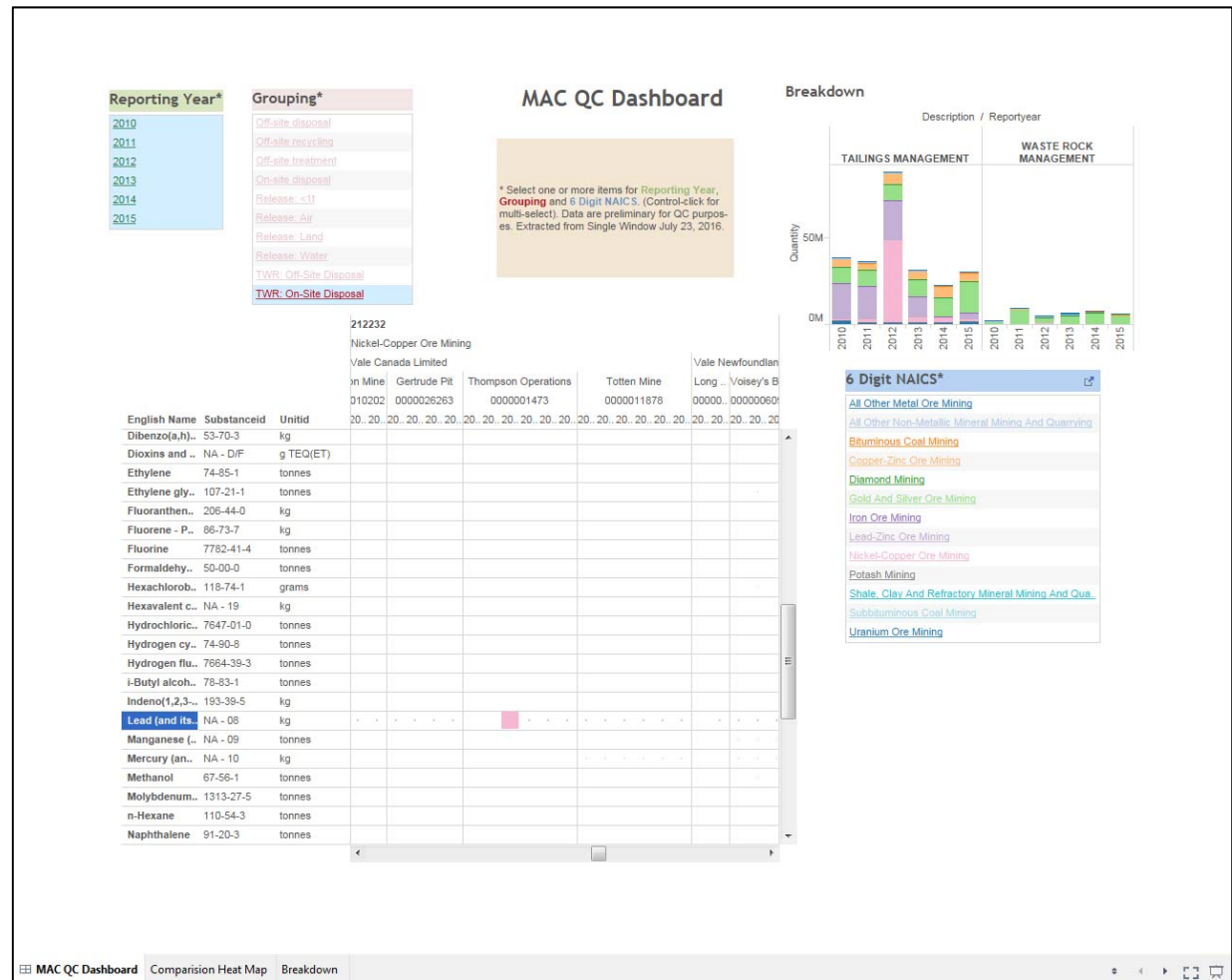
Environnement et  
Changement climatique Canada

Canada



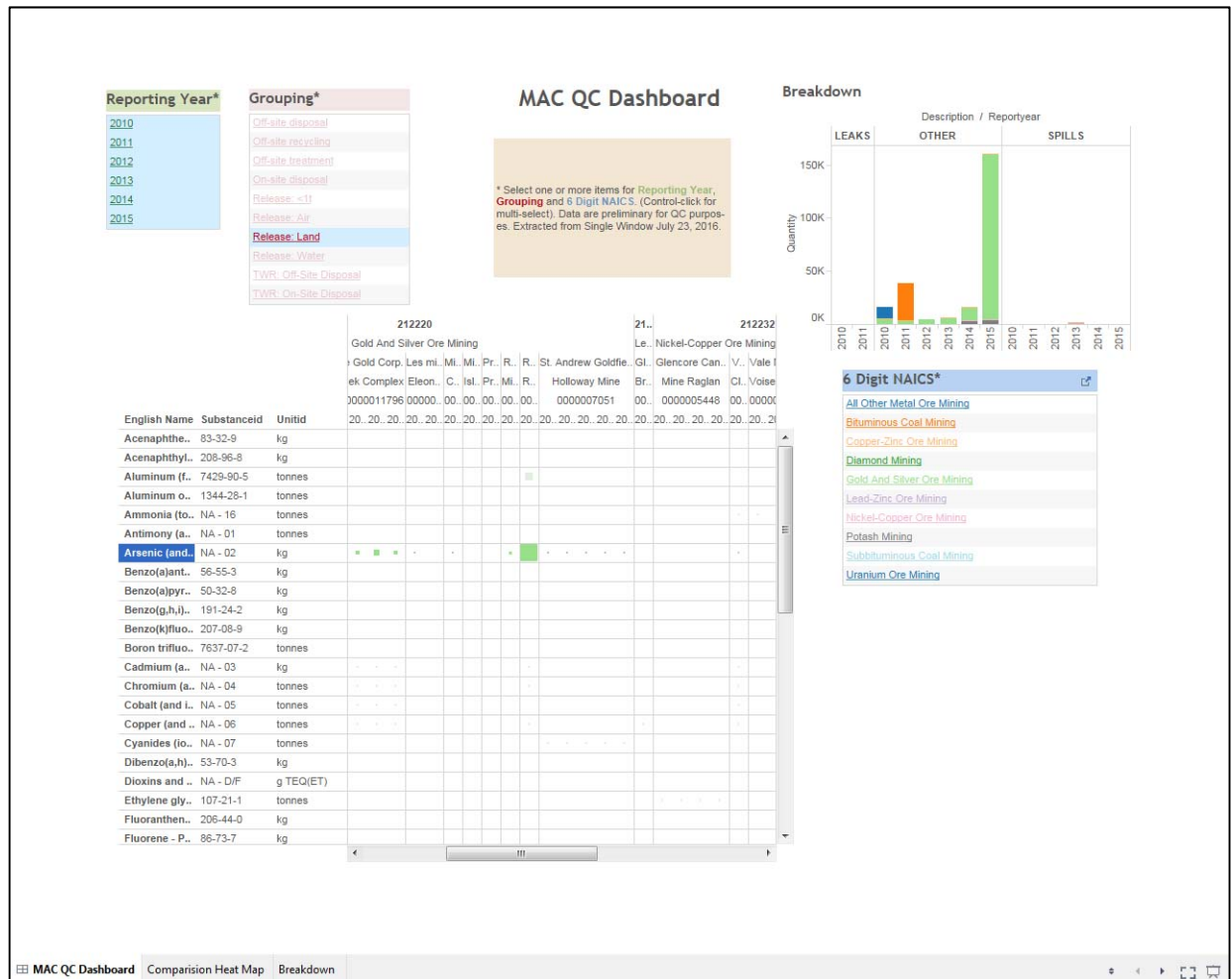
# Data Visualization Tools

- Facility reporting large disposal of tailings of lead starting in 2012
- QC issue was identified and subsequently corrected (unit error in 2012 report for disposal of tailings)



# Data Visualization Tools

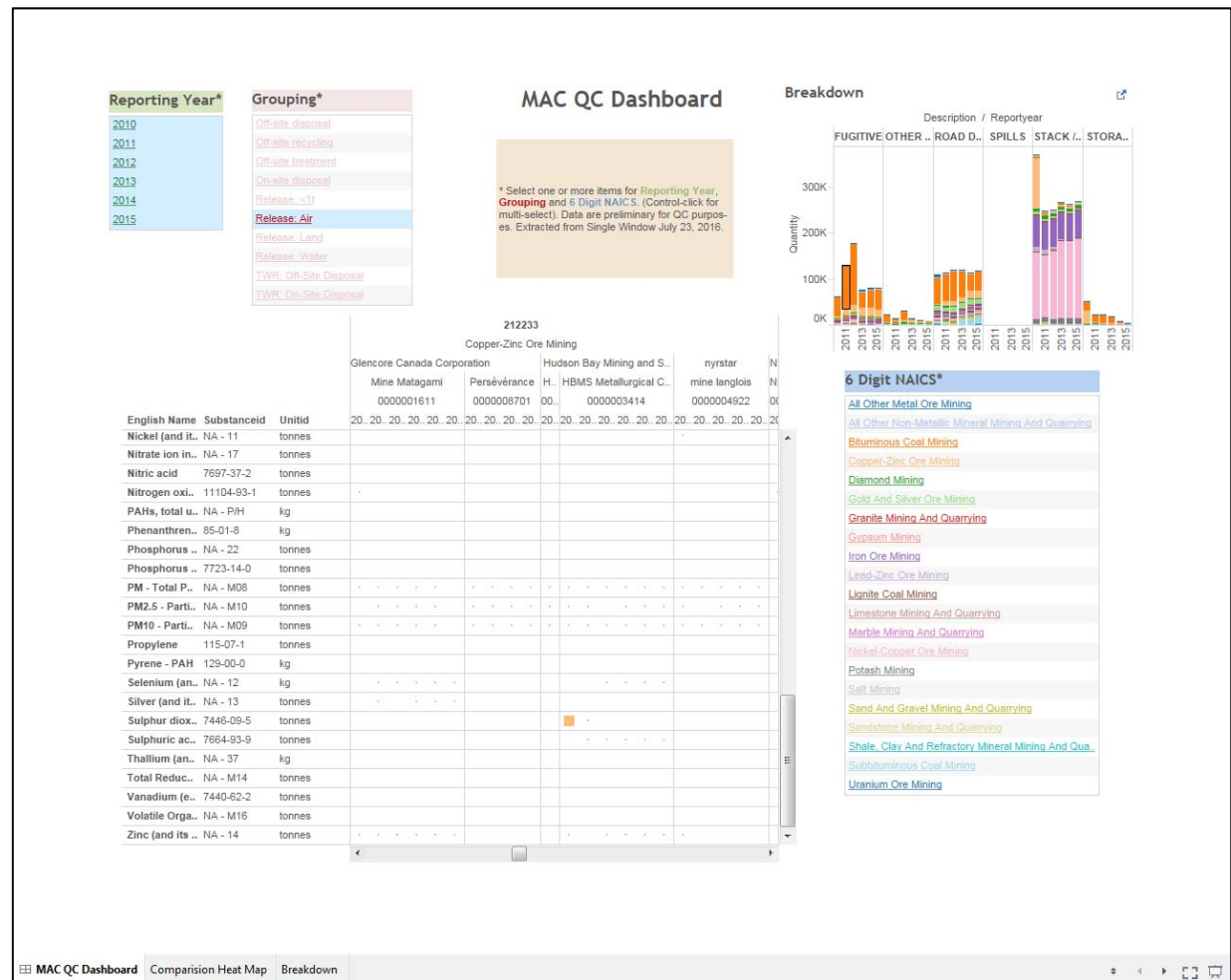
- New facility reporting large releases to land of arsenic
- QC issue was identified and subsequently corrected (reported in the wrong category – release to land instead of disposal to tailings)



Page 18 – October 20, 2016 – US TRI Conference

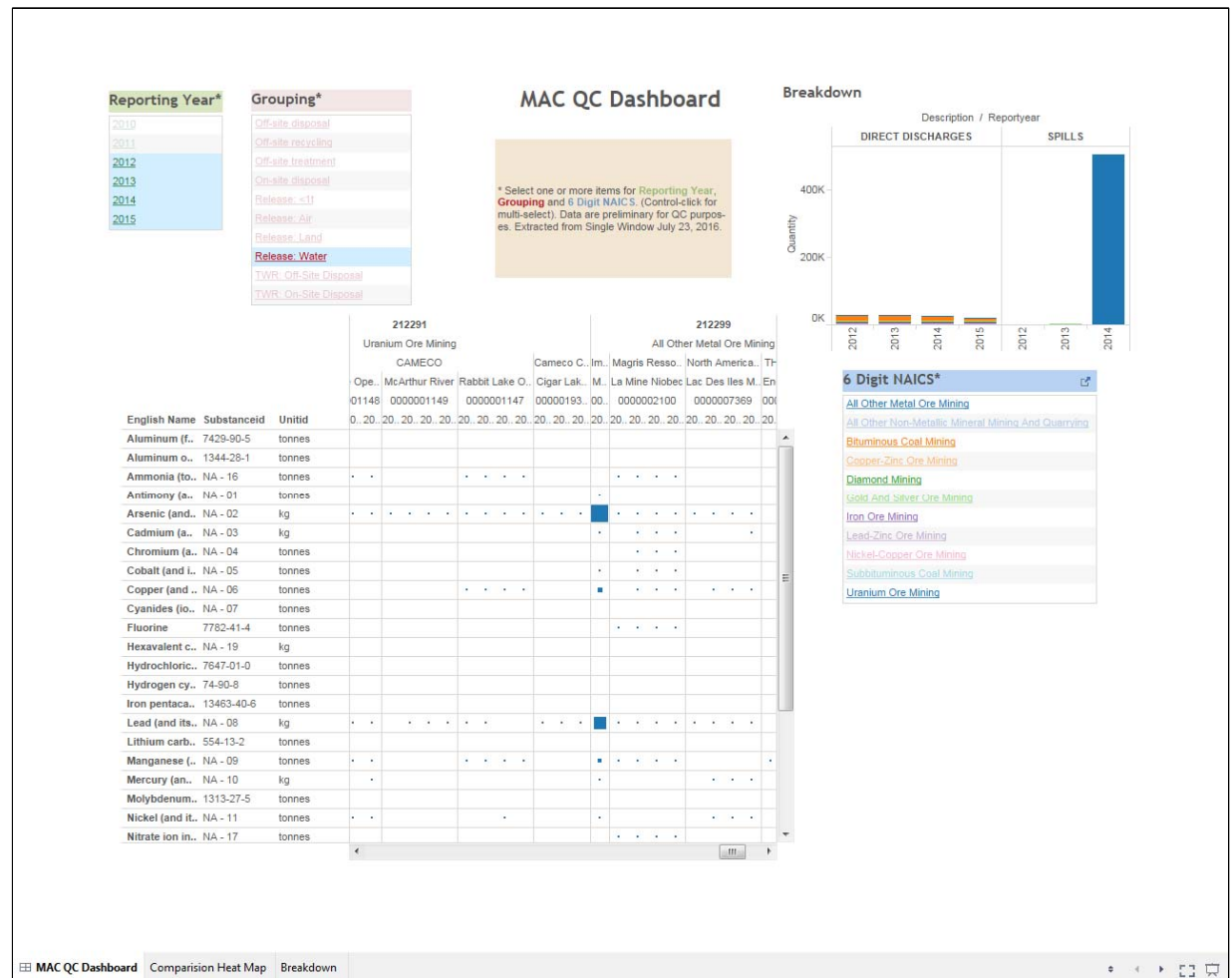
# Data Visualization Tools

- Large decrease in SO<sub>2</sub> emissions from 2010 to 2011
- Not a QC issue – actual decrease due to change of process and change of fuels.



# Data Visualization Tools

- Very large increase in reported releases to water of metals in 2014
- In this case, it is not a QC issue, but the tailings pond breach mentioned previously



# Conclusions: Data Quality

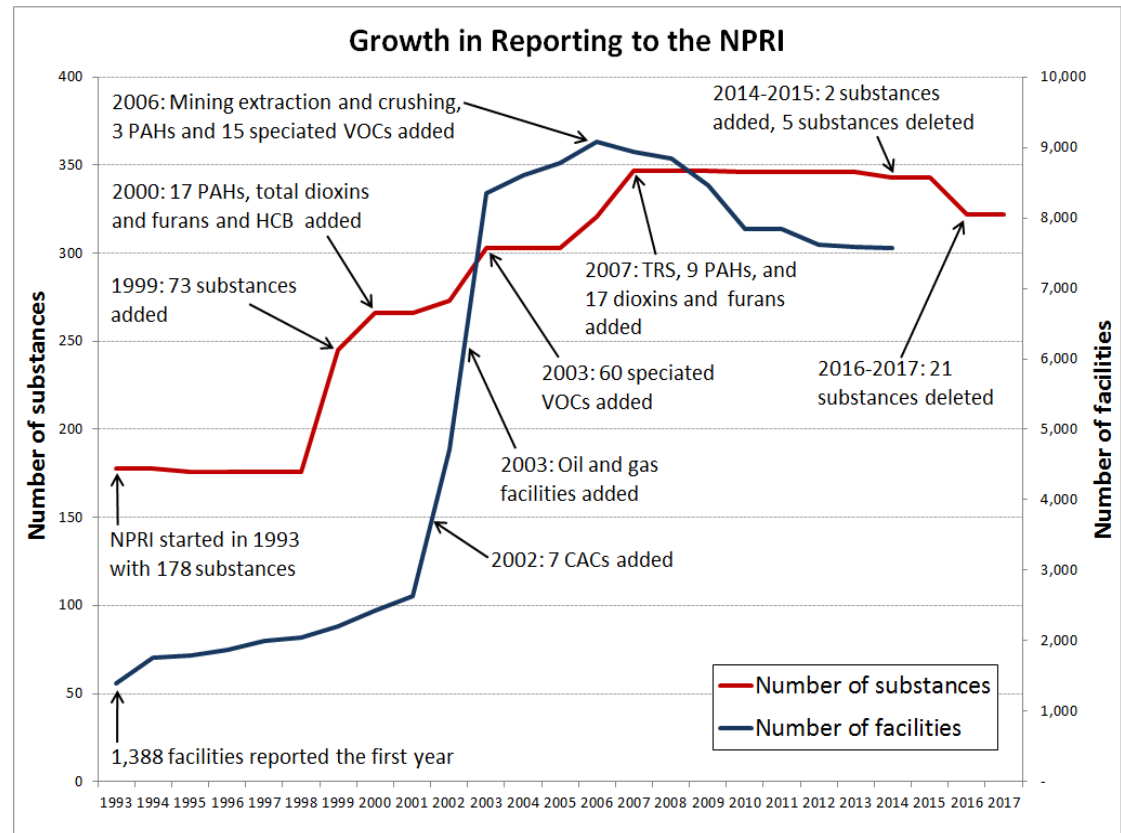
---

- Ongoing challenge – with millions of data points, will never be perfect
- Very important so that users can be confident in the reliability of data
- A variety of approaches to improve data quality are required



# The NPRI has expanded since its inception...

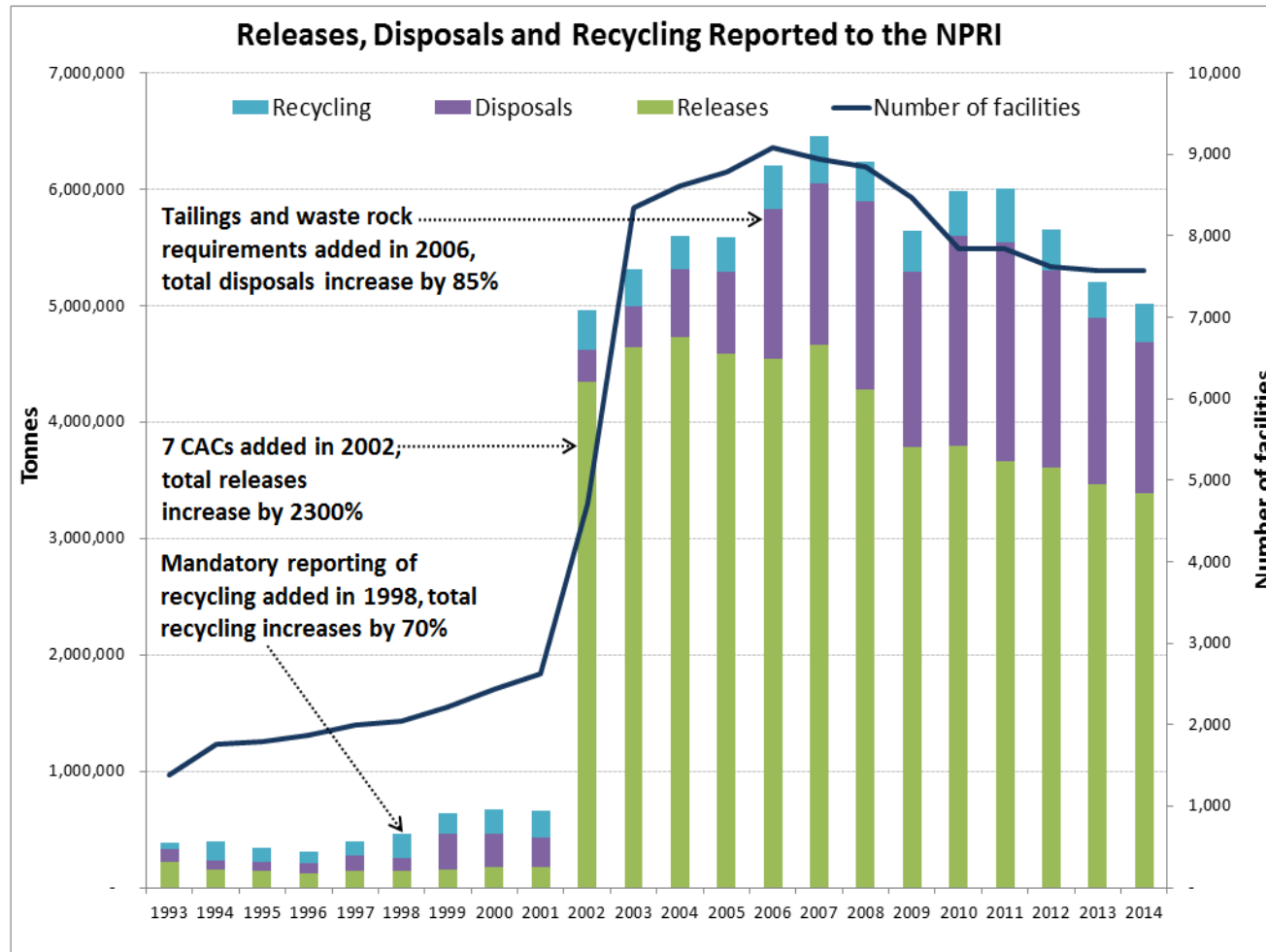
- Since the first year of the NPRI, EC has:
  - Added over 150 substances, including toxic substances and air pollutants
  - Reduced thresholds or established different reporting criteria for certain substances and activities
  - Removed exemptions for certain sectors



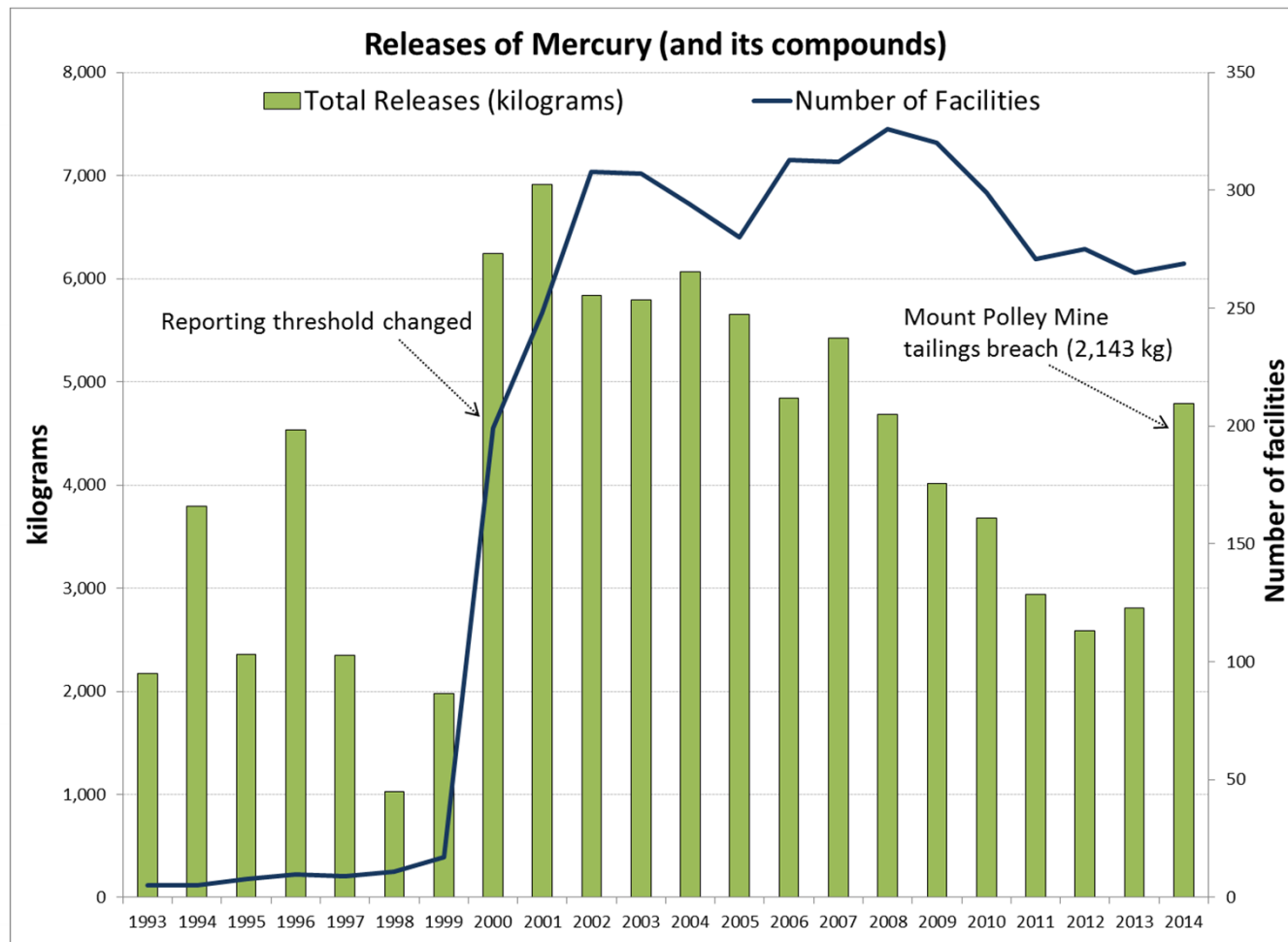
Documentation on the changes over time is available on the NPRI website



# These changes are reflected in the reported quantities, overall...

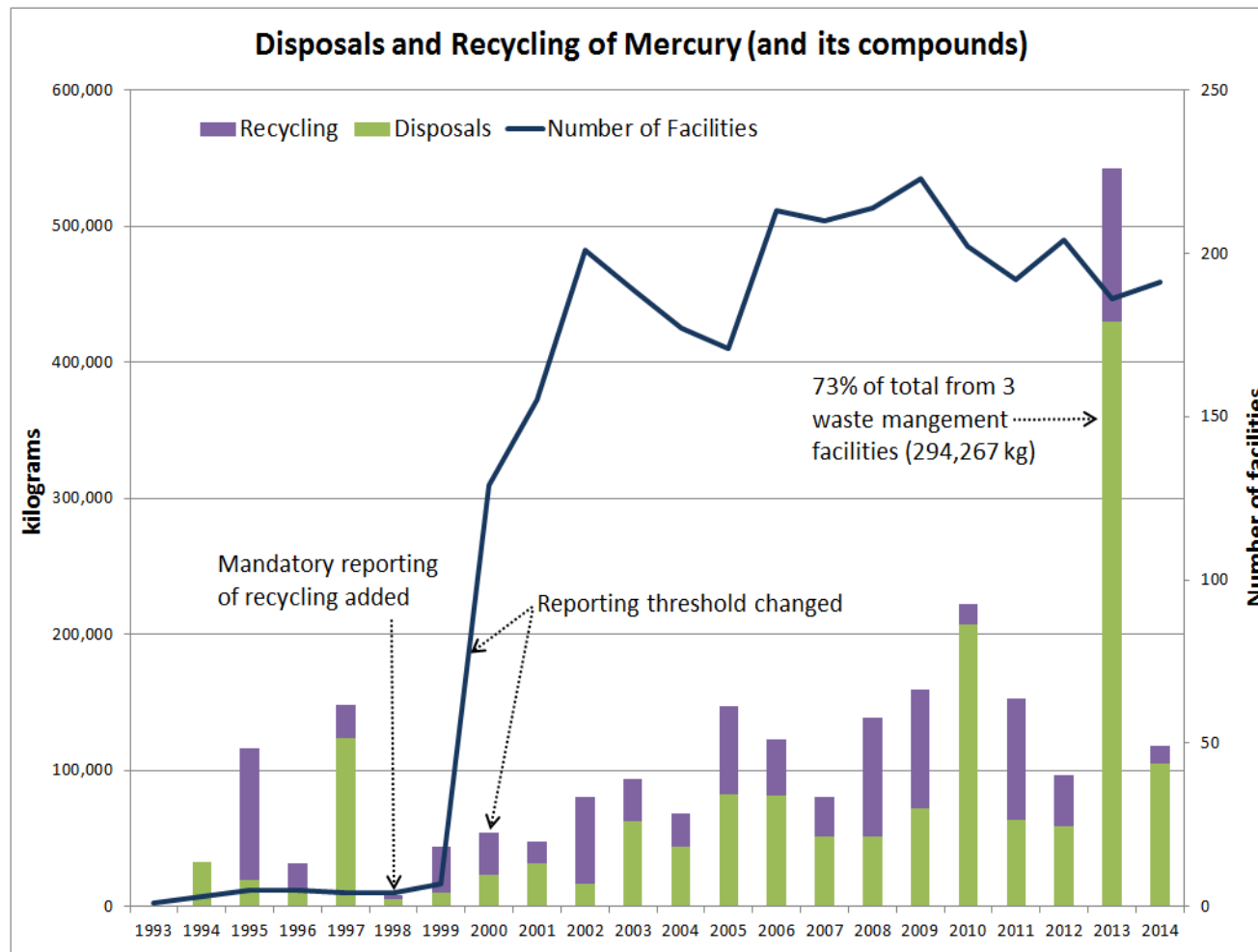


# ...and for releases of individual substances...





# ...whereas disposal and recycling quantities tend to be more variable.



Page 25 – October 20, 2016 – US TRI Conference



Environment and  
Climate Change Canada

Environnement et  
Changement climatique Canada

Canada

# Questions / Comments?

## Contact information for the NPRI:

Environment and Climate Change Canada  
Place Vincent Massey  
Gatineau, Québec K1A 0H3

Tel: 1-877-877-8375

E-mail: [ec.inrp-npri.ec@canada.ca](mailto:ec.inrp-npri.ec@canada.ca)

NPRI Website:

[www.ec.gc.ca/inrp-npri](http://www.ec.gc.ca/inrp-npri)

# Thank you!

