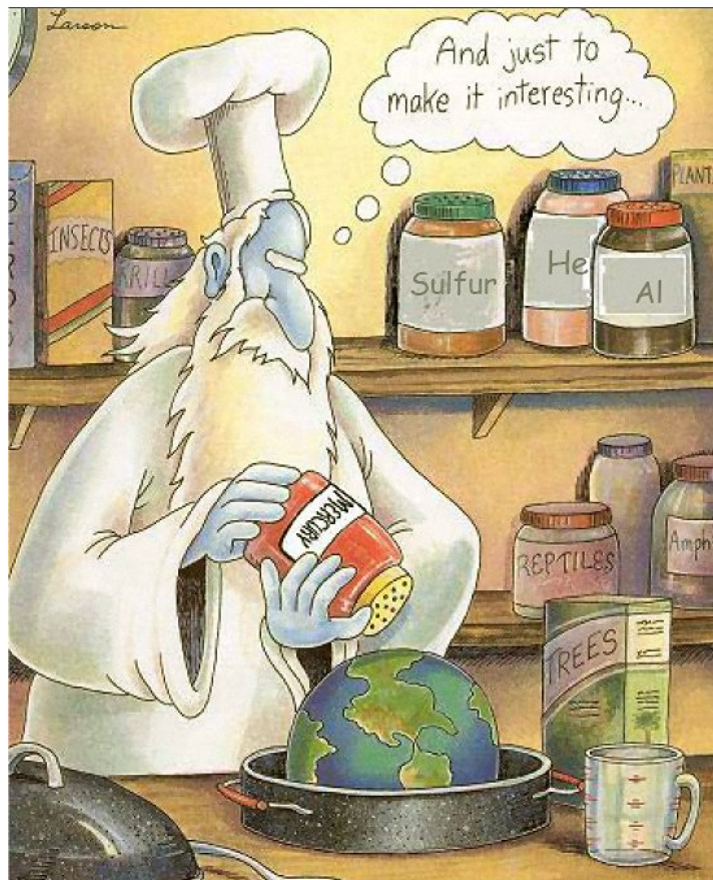# Use of the 2002 NEI in the Risk and Technology Review (RTR)

Anne Pope, EPA
pope.anne@epa.gov
Paula Hirtz, EPA
hirtz.paula@epa.gov
Ted Palma, EPA
palma.ted@epa.gov
Melodie Vines, ERG
melodie.vines@erg.com

Overview

⌘ What is RTR?

⌘ How is the 2002 NEI for HAPs used in RTR?

⌘ How can I review the 2002 NEI data as part of the RTR ANPR?

⌘ Demo of ANPR 2002 NEI database

Challenges Facing Residual Risk Program

- CAA requires review of residual risk and technology for 96 standards
- Develop rules which target high-risk facilities in categories without impacting low-risk ones
    - Process should be simple, efficient
    - Process should be implementable by States
- Develop innovative ways to reduce risks where controls are not available
    - MACT may have been effective, yet risks may still be high
- Challenging schedule, limited resources, uncertainty regarding deadlines

New Directions for Residual Risk Program

- ⌘ Develop Risk and Technology Review (RTR) Rule
  - ⌃ Link MACT (Technology) review (112d(6)) to Residual Risk (112(f)(2)); hence the name Risk and Technology Review

- ⌘ RTR (Phase 1)
  - ⌃ Completed residual risk and technology reviews for 8 source categories by 12/06
  - ⌃ The first 8 reviews show the MACT standards generally did a good job, but may not provide adequate control in some cases
    - ☒ Two categories have low risk (less than 1 in 1 million for cancer, 1.0 HI)
    - ☒ Five categories have residual risk bordering on unacceptable
    - ☒ Proposed or final ample margin of safety decisions would require additional control for 4 MACT categories

- ⌘ RTR (Phase 2+) Combine the remaining MACT standards requiring residual risk and technology reviews into a few groups
  - ⌃ Enables EPA to:
    - ☒ More closely meet statutory dates
    - ☒ Raise and resolve programmatic issues collectively
    - ☒ Minimize resources by using available data and focusing attention on high risk sources
    - ☒ Provide consistent review and analysis

Phase II RTR Categories

Group 1

Acetal Resins Production
Butyl Rubber Production
Epoxy Resins Production
Ethylene-Propylene Rubber Production
Hydrogen Fluoride Production
Neoprene Production
Non-Nylon Polyamides Production
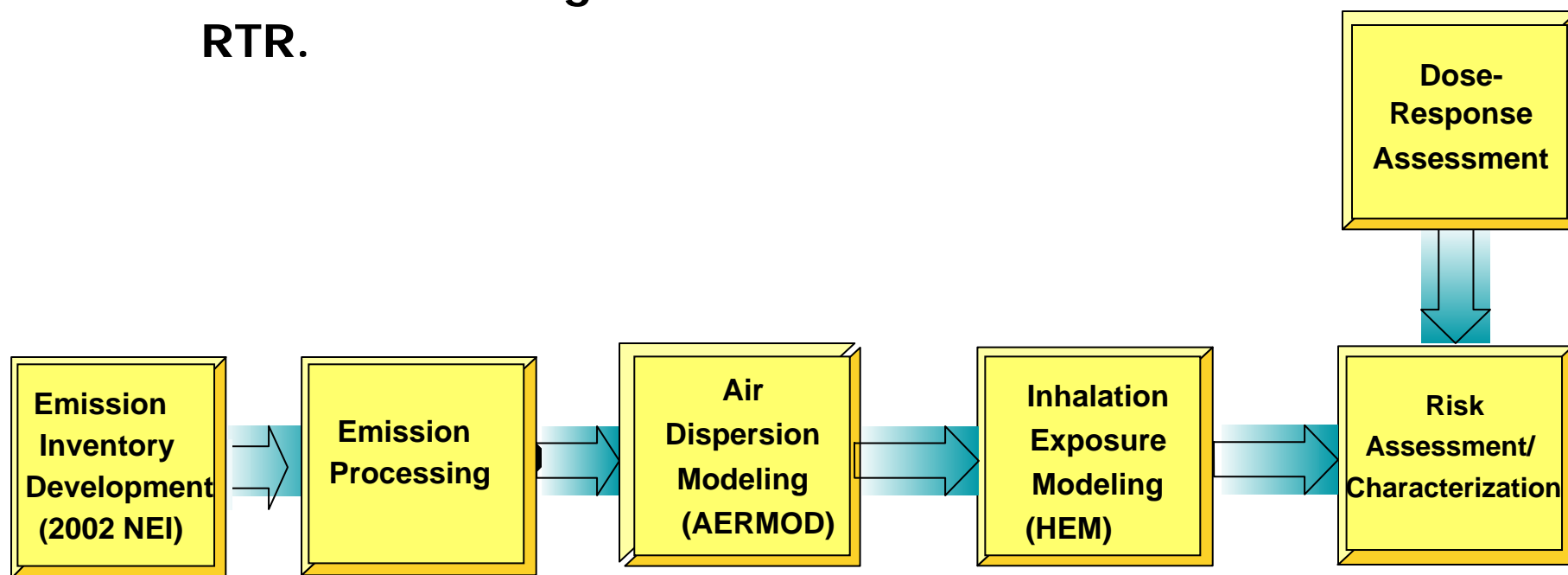Polysulfide Rubber Production

Group 2

Acrylonitrile-Butadiene-Styrene Production
Aerospace Industries
Epichlorohydrin Elastomers Production
Hypalon (TM) Production
Marine Vessel Loading Operations
Methyl Methacrylate-Acrylonitrile-Butadiene-Styrene Production
Methyl Methacrylate-Butadiene-Styrene Terpolymers Production
Mineral Wool Production
Natural Gas Transmission & Storage
Nitrile Butadiene Rubber Production
Nitrile Resins Production
Oil & Natural Gas Production
Petroleum Refineries - Other Sources Not Distinctly Listed
Pharmaceutical Production
Polybutadiene Rubber Production
Polyethylene Terephthalate Production
Polystyrene Production
Primary Aluminum Production
Printing/Publishing (Surface Coating)
Shipbuilding & Ship Repair
Styrene Acrylonitrile Production
Styrene-Butadiene Rubber & Latex Production

How is the 2002 NEI used in the RTR?

We are modeling the 2002 NEI for HAPs in the RTR.

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Emission Inventory Development (2002 NEI)  →  Emission Processing  →  Air Dispersion Modeling (AERMOD)  →  Inhalation Exposure Modeling (HEM)  →  Risk Assessment/Characterization  ←  Dose-Response Assessment
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What Process Would We Use for RTR?

- Extract MACT category information from latest emissions inventory (2002 NEI, version 3) for the 34 MACT standards with compliance dates of 2002 and earlier
- Publish inventory and results in ANPR, get public comments and corrections, and obtain better source data, as appropriate
- Model each MACT category to obtain inhalation risks, including cancer risk and incidence, population cancer risk, and non-cancer effects (chronic and acute)
  - Set aside low-risk source categories
  - Evaluate effectiveness and cost of additional risk reduction options for the remaining source categories
- Model each MACT category emitting PB-HAPs to obtain multi-pathway risks and effects
  - Model persistent bioaccumulative HAP (PB-HAPs) source categories
- Make acceptability and ample margin of safety determinations
- Propose, address public comments, and take final action on the group of MACT categories

PB-HAPs

- Cadmium
- Chlordane
- Chlorinated dibenzodioxins and furans
- DDE
- Heptachlor
- Hexachlorobenzene
- Hexachlorocyclohexane
- Lead compounds including Alkyl-lead
- Mercury and compounds
- Methoxychlor
- Polychlorinated biphenyls (PCBs)
- Polycyclic Organic Matter (POM)
- Toxaphene
- Trifluralin

(EPA, 2004.Air Toxics Risk Assessment Reference Library, Volume 1, Exhibit 14-1.)

How Would We Make Regulatory Decisions in RTR?

- 112(f) residual risk would follow the Benzene Policy to identify MACT standard categories as:
  - Low Risk (less than 1 in 1 million, HI <1.0) - no additional risk reduction, presumptive ample margin of safety met
  - Not Low Risk - no additional risk reduction needed for ample margin of safety
    - Risks are acceptable (less than 100 in 1 million), and
    - No controls are available or controls are not cost-effective
  - Not Low Risk - with additional risk reduction to achieve ample margin of safety
    - Risks are unacceptable (greater than 100 in 1 million), or
    - Cost-effective controls are available
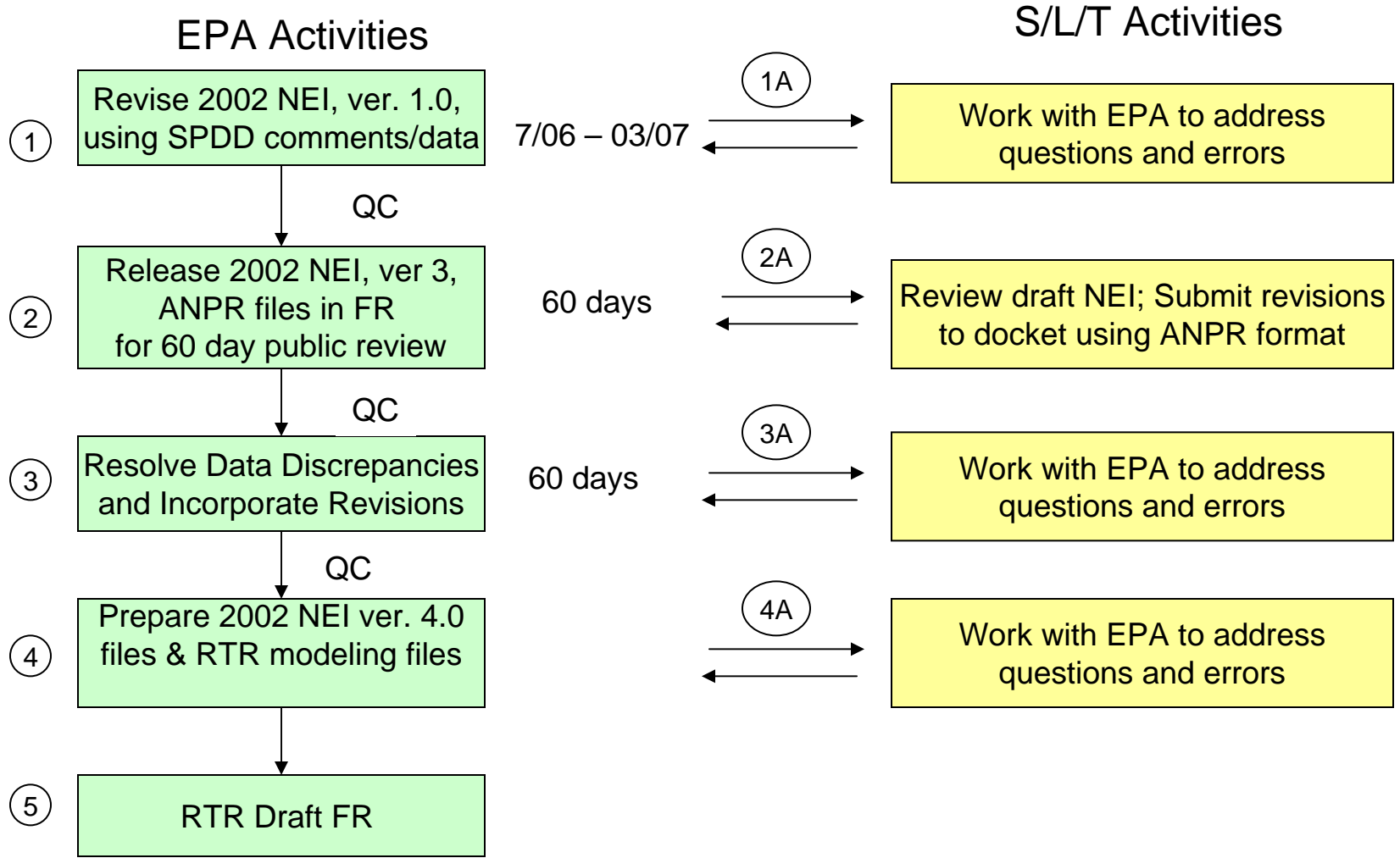- 112(d)(6) technology review would mirror the ample margin of safety determination

What Would The RTR Standards Look Like?

⌘ Where further action is warranted, standards would include technology, work practice, or performance standards as amendments to the existing standards

⌘ Consider adapting emission cap as residual risk requirement.

⌘ For source categories where additional standards are needed to provide an ample margin of safety, provide a low risk exemption

  ◲ Use analysis to identify low risk source characteristics that would exempt a portion of the source category from additional requirements

  ◲ If necessary, provide for site specific risk assessment (demonstration) to show low risk (TFLRD)

2002 NEI RTR Schedule & Activities

EPA Activities

S/L/T Activities

(1) Revise 2002 NEI, ver. 1.0, using SPDD comments/data

7/06 – 03/07

1A → Work with EPA to address questions and errors ←

↓ QC

(2) Release 2002 NEI, ver 3, ANPR files in FR for 60 day public review

60 days

2A → Review draft NEI; Submit revisions to docket using ANPR format ←

↓ QC

(3) Resolve Data Discrepancies and Incorporate Revisions

60 days

3A → Work with EPA to address questions and errors ←

↓ QC

(4) Prepare 2002 NEI ver. 4.0 files & RTR modeling files

4A → Work with EPA to address questions and errors ←

↓

(5) RTR Draft FR

What are the steps for preparing NEI files for RTR modeling?

1. **Revise 2002 NEI, ver. 1.0, using SPDD comments/data**

   ⌘ AQAD retrieves 2002 NEI for HAPs, version 1.0 , February 2006, data for RTR categories.

   ⌘ SPDD staff conducts detailed review of 2002 NEI, version 1.0 and provides revisions and new data to 2002 NEI
   – MACT Code revisions - facilities and processes within facilities associated with category
   – Emission revisions
   – Stack parameter revisions
   – Geographic coordinate revisions
   – New data provided for the following categories:
     • Petroleum refineries – benzene data for 23 facilities
     • Polymers and Resins II
     • Polymers and Resins IV
     • Secondary lead Smelting
     • Shipbuilding

What are the steps for preparing NEI files for RTR modeling?

2. **Release 2002 NEI, ver 3, ANPR files in FR for 60 day public review**

   ⌘ AQAD prepares 2002 NEI for HAPs, version 3, March 2007 using SPDD revisions.

   – NEI for HAPs version 3 posted on CHIEF web site.

   ⌘ ANPR NEI files will be available 60 days for public comment. April 1 – May 31, 2007.

   – AQAD prepares ANPR NEI version 3 files for review as part of the RTR.
   – Comments will only be accepted using ANPR NEI database
   – Documentation must accompany proposed revisions submitted for the ANPR NEI files

What are the steps for preparing NEI files for RTR modeling?

3. **Resolve Data Discrepancies and Incorporate Revisions**

   ⌘ AQAD evaluates and incorporates proposed revisions.

     – Reviews proposed revisions and documentation.
     – Resolves data discrepancies between proposed revisions and original data source in the NEI.
     – Incorporates Revisions

4. **Prepare 2002 NEI ver. 4.0 files & RTR modeling files**

   ⌘ AQAD prepares 2002 NEI, version 4.0 and posts files on CHIEF web site.

   ⌘ AQAD provides data for RTR modeling used in draft FR rule.

What is Best Way to Review the NEI for the RTR?

1. **Facility Information**
    - Facility Name
    - Facility Address
    - State and County and Tribal information
    - Facility Category (major or area)

2. **Source Category Representation**
    - Missing facilities in the category
    - Facilities that should be removed from category
    - MACT Code Assignment
    - SCCs

What is Best Way to Review the NEI for the RTR?

3. **Emissions Point Data**
   - Emission release point type (fugitive, vertical stack, etc.)
   - Stack parameters for each emission release point - Conduct more thorough review of stack parameters that have been defaulted.
   - Latitude and longitude - Conduct more thorough review for points that have defaulted coordinates; especially coordinates defaulted to county centroid.

4. **Emissions Data**
   - Emissions (tons/yr) of each individual pollutant - Review pollutants with potential for high toxicity and persistent bioaccumulative HAPs first.
   - Acute emissions
   - Speciation of metal HAPs and polycyclic organic matter (POM)
   - HAP emissions performance level (e.g., actual, allowable, potential, maximum)
   - Chromium and mercury speciation profiles for processes

How are NEI data processed for RTR modeling?

1. <u>Extract</u> metal and cyanide compounds into elemental metal or hydrogen cyanide using 2002 *NEI tox wt factors* file. For all other pollutants, fractionation is not needed.
   - ☑ For all NEI poll except 136 and 7440473: Multiply emissions by Metal_CN Speciation Factor to extract metal and cyanide mass for tox weighting

2. <u>Speciate</u> chromium into hexavalent and trivalent chromium using *Cr Speciation* file.
   - ☑ For NEI poll 136 and 7440473: Use chromium speciation file to speciate source category emissions into Cr(VI) and Cr(III) emissions

How are NEI data processed for RTR modeling?

3. <u>Speciate</u> mercury into 3 forms using *Mercury Speciation* file.
    - ☑ For NEI poll 7439976 and 199: use mercury speciation file to speciate source category emissions into Elemental Gaseous Mercury, Gaseous Divalent Mercury, and Particulate Divalent Mercury.

4. <u>Calculate</u> TEQ for congeners of dioxin/furans using TEQ factors in *2002 Tox wt factors* file.

5. <u>Group</u> POM compounds in the NEI into the 8 groups for toxicity using *2002 Tox wt factors* file.

How are NEI data processed for RTR modeling?

6. <u>Partition</u> particulate inventory species into multiple pollutant categories with different particulate size classes, and HAP compounds using coarse/fine fractions in *2002 Tox wt factors* file.

    Example: apportion lead chromate to:
    ⌘   lead, fine particulate; lead, coarse particulate;
    ⌘   chromium VI, fine particulate; and chromium VI, coarse particulate

7. <u>Assign</u> UREs and RFCs for the pollutants to be modeled.

What is the ANPR NEI file format?

⌘ View and Print instructions

⌘ View Summary Data
- National MACT Emissions
- State County MACT Emissions
- Facility MACT Emissions
- Facility – All Data

What is the ANPR NEI file format?

⌘ Revise Data
  - ⌂ Contact information - required
  - ⌂ Revise Emission Fields – Emissions, Start and End Dates, HAP Performance Level
  - ⌂ Revise Process Fields – MACT Code, SCC
  - ⌂ Revise Stack Fields – Stack Parameters, Emission Release Point Type, Geographic Coordinates
  - ⌂ Revise Facility Information – Tribe, County, Facility Category, Facility Name, Facility Address, City, State, Zip Code
  - ⌂ Add Data to Existing Facility

⌘ Add Facility
  - ⌂ All data fields must be provided

⌘ Print Revision Record

⌘ Submit Revisions and Documentation to Docket

ANPR NEI DEMO