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NC DAQ Priorities for Future SSAB Work

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Overview

- Overview NC Air Toxics Program
  - History
  - Legislative actions affecting the program
- Review recent federal actions on pollutants of concern
- Highlight current NC sources and magnitude of air emissions
- Discuss / compare federal and NC health standards
- Provide DAQ recommended priorities

NC Air Toxics Program

- Purpose
  - Air toxics program that is a risk-based approach to protect NC citizens from adverse health effects resulting from exposure to toxic air pollutants
- Authority
  - 1989 – *Executive Order:* Ambient Air Standards for Toxic Pollutants – Governor Martin
- History
  - Mid-1990's – increasing public environmental awareness
  - NC Administrative Code Title 15A
    - 1990 - 84 Toxic Air Pollutants
    - 1991 – 21 Carcinogenic Pollutants
  - 1995 – Industry questions efficacy of toxics program
  - 1996-97 – Working group formed to study air toxic program issues
- The total TAPs have changed over time
  - XXX currently

Meanwhile back at the EPA the Clean Air Act Amendments of 1990 were promulgated

2011 – 12 Legislative Action

- 2011 - House Bill 952—
  - General Assembly again directed DAQ to review the states air toxics program “to determine whether changes could be made to the rules or their implementation to reduce unnecessary regulatory burden and increase the efficient use of Division resources while maintaining protection of public health”.
- 2012 - Session Law 2012-91 (G.S. 143-215.107(a)) - provides an exemption to the air toxics rules for any air emission source that is subject to any requirement under either:
  - Regulations established by the EPA that require sources of toxic air pollutants to control emissions of toxic air pollutants through the use of maximum achievable control technologies or generally available control technologies regulated through NESHAPs.
  - State permits that established case-by-case emission limits for toxic air pollutants pursuant to Section 112(j) of the Clean Air Act, which requires states to establish toxic emission standards when EPA fails to do so for a given industrial sector.
- The session law, however, requires DAQ to review permit applications that result in a net increase in toxic air pollutants to ensure the emissions will not pose an unacceptable risk to human health. If DAQ finds that emissions from a facility will pose an unacceptable risk to human health, the facility must comply with state air toxics rules even if it falls within one of the two exempt categories.

NC Air Toxics Program vs. Federal Air Toxics Programs

NC Air Toxics Program	Federal Air Toxics Programs
Based on preventing exposures to toxic air pollutants.	Primarily based on reducing emissions by source category to the lowest levels observed nationally.
Offers flexible solutions for compliance. Facilities may choose which emission sources to address, what compliance measures are needed.	Specific control equipment or techniques may be dictated for all affected sources. Compliance alternatives may be few, expensive.
Based on facility-wide emissions. All sources of toxic air pollutants are considered.	Focuses on specific categories of individual emission sources. Some emission sources may not be covered.
Designed to supplement and complement the federal programs. If federal rules provide sufficient protection from exposures, no further state controls are required. If federal rules fall short, state rule provide a backstop.	Federal programs not intended to comprehensively address all air toxic emissions. Were designed in anticipation that state and local air toxics programs would address local issues and federal program limitations.

Recent Federal Actions

- Ethylene Oxide (EtO)
  - Health Based Standards
    - IRIS value for EtO revised 12/16/2016
  - Regulatory Actions – Residual Risk and Technology Review (RTRs)
    1. Miscellaneous Organic Chemical Manufacturing (MON)
       - Final December 21, 2022; Reconsideration proposed April 27, 2023
    2. Ethylene Oxide Emissions Standards for Sterilization Facilities (Commercial only)
       - Proposed April 13, 2023
       - Emission standards for previously unregulated sources; specifically fugitive emissions
    3. Synthetic Organic Chemical Manufacturing Industry or Hazardous Organic National Emission Standards for Hazardous Air Pollutants (NESHAP) (HON)
       - Proposed April 25, 2023
    4. Ethylene Oxide Production
       - Proposed April 27, 2023

Recent Federal Actions

- Acrolein
  - Health Based Standards
    - IRIS value - RfC of 2 X 10^{-5} mg/m^3
    - Last updated 6/3/2003
  - Regulatory Actions
    - Plywood and Composite Wood Products NESHAP
      - Proposed May 18, 2023
      - HAP standards for processes currently unregulated for total HAP (including acetaldehyde, acrolein, formaldehyde, methanol, phenol, propionaldehyde)
    - HON
      - Proposed April 25, 2023
      - Amendments to HAP standards for SOCMI source category - acrolein listed as a main HAP of concern

Recent Federal Actions

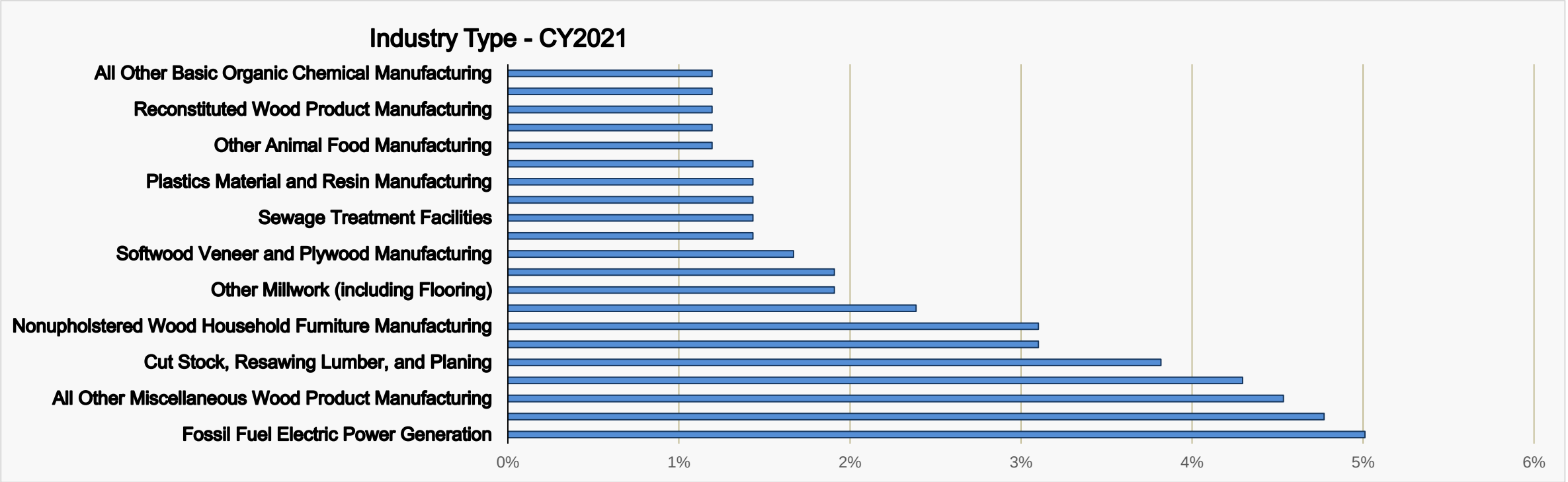
- 1-bromopropane (1-BP)
  - January 5, 2022, EPA issued a final rule to add 1-bromopropane (1-BP) to the Clean Air Act's list of hazardous air pollutants
  - Solvent used in electronics and metal cleaning, surface coatings, dry cleaning, adhesives, and as an intermediate chemical in the manufacture of pharmaceuticals and agricultural products
  - Based on the evidence of the carcinogenicity and toxicity of 1-BP, EPA concluded that 1-BP is reasonably anticipated to cause adverse effects to human health
  - No regulatory actions have occurred to date
  - 19 NESHAPs *possibly* impacted

NC sources and magnitude of air emissions - EtO

- 36 permitted facilities emit EtO
  - 26 are subject to a proposed NESHAP which include EtO emission limits or controls
    - MON, HON, EtO Commercial Sterilizers, Organic Liquid Distribution
    - 1,043 lbs emitted in 2021 by these sources
  - 10 remaining are not currently subject to a proposed NESHAP and have EtO emissions
    - 27 lbs emitted in 2021 by these sources

Industry Types
Postharvest Crop Activities (except Cotton Ginning)
Broadwoven Fabric Mills
Textile and Fabric Finishing (except Broadwoven Fabric) Mills
Other Pressed and Blown Glass and Glassware Manufacturing
Boat Building
Upholstered Household Furniture Manufacturing
Packing and Crating
Colleges, Universities, and Professional Schools

NC sources and magnitude of air emissions - Acrolein



- CY2016 | 512 facilities
  - Total = 165,945 lbs
- CY2021 | 421 facilities
  - Total = 139,103 lbs

- **Delta**
  - **91 fewer facilities**
  - **26,842 lbs less emitted**
  - **16%**

Other Recent Information on Acrolein

- International Agency for Research on Cancer (IARC) Working Group on the Identification of Carcinogenic Hazards to Humans reviewed acrolein October – November 2020
- Dr. Dorman served on working group
- 2021 IARC Monograph available
- More recent health studies included
- Overall conclusion: Acrolein is probably carcinogenic to humans (Group 2A)

NC sources and magnitude of air emissions – 1-BP

- 2 facilities reported air releases of 1-BP for calendar year 2021 in the Toxics Release Inventory.
- These facilities also have NC air permits; however, they were not required to report 1-BP emissions to NC in 2021
  - Their emissions will be reported in the future

Industry Type	Amount (lbs)
Transportation Equipment	17,766
Nonmetallic Mineral Product	1,780

Federal and NC Inhalation Health Endpoints

Name	Federal					NC		
	Endpoint	Date	IUR* (per $\mu g/m^3$)	Converted IUR to mg/m^3	RfC (mg/m^3)	Endpoint	Date	AAL† (mg/m^3)
EtO[a]	Cancer	2016	3×10^{-3}	3.33×10^{-6}	--	Cancer	1991	2.7×10^{-5}
1-BP[b]	Cancer	2022	3×10^{-3}	3.33×10^{-6}	--	NONE	--	--
Acrolein[c,d]	Chronic	2003	--	--	2×10^{-5}	Acute	1997	0.08

* IUR = Inhalation Unit Risk
† AAL – Acceptable Ambient Level | NC Air Toxics Program
a https://iris.epa.gov/static/pdfs/1025_summary.pdf
b https://www.epa.gov/sites/default/files/2020-08/documents/risk_evaluation_for_1-bromopropane_n-propyl_bromide.pdf
c https://iris.epa.gov/static/pdfs/0364_summary.pdf
d Last AAL review completed by prior NC SAB in 2016; no change.

DAQ Recommended Priorities

- Ethylene Oxide
  - New health studies
  - Federal rulemaking
  - AAL based on 1991 health studies for cancer endpoint
  - Not all industry types may be covered by a NESHAP
- Acrolein
  - Emissions decreased 16% from 2016 – 2021
  - AAL based on 1997 health studies for acute endpoint
  - New health studies - 2021 IARC review
    - Are there others?
- 1-BP
  - New HAP listing
  - Expecting to be added to future NESHAPs
  - Expect more sources to be revealed in future emission inventories

DAQ Request

- Evaluate whether there are adequate, available health studies/data to warrant review of the AALs at this time for
    - Ethylene oxide
    - 1-Brompropane
    - Acrolein
- Conduct literature review and provide recommended concentrations of contaminants in a “range of risks” for DEQ’s consideration for potential revision/addition of NC’s AALs in the air toxics rules through Environmental Management Commission rulemaking

Contact Information

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