
# Taconite Iron Ore Processing

## National Emission Standards for Hazardous Air Pollutants

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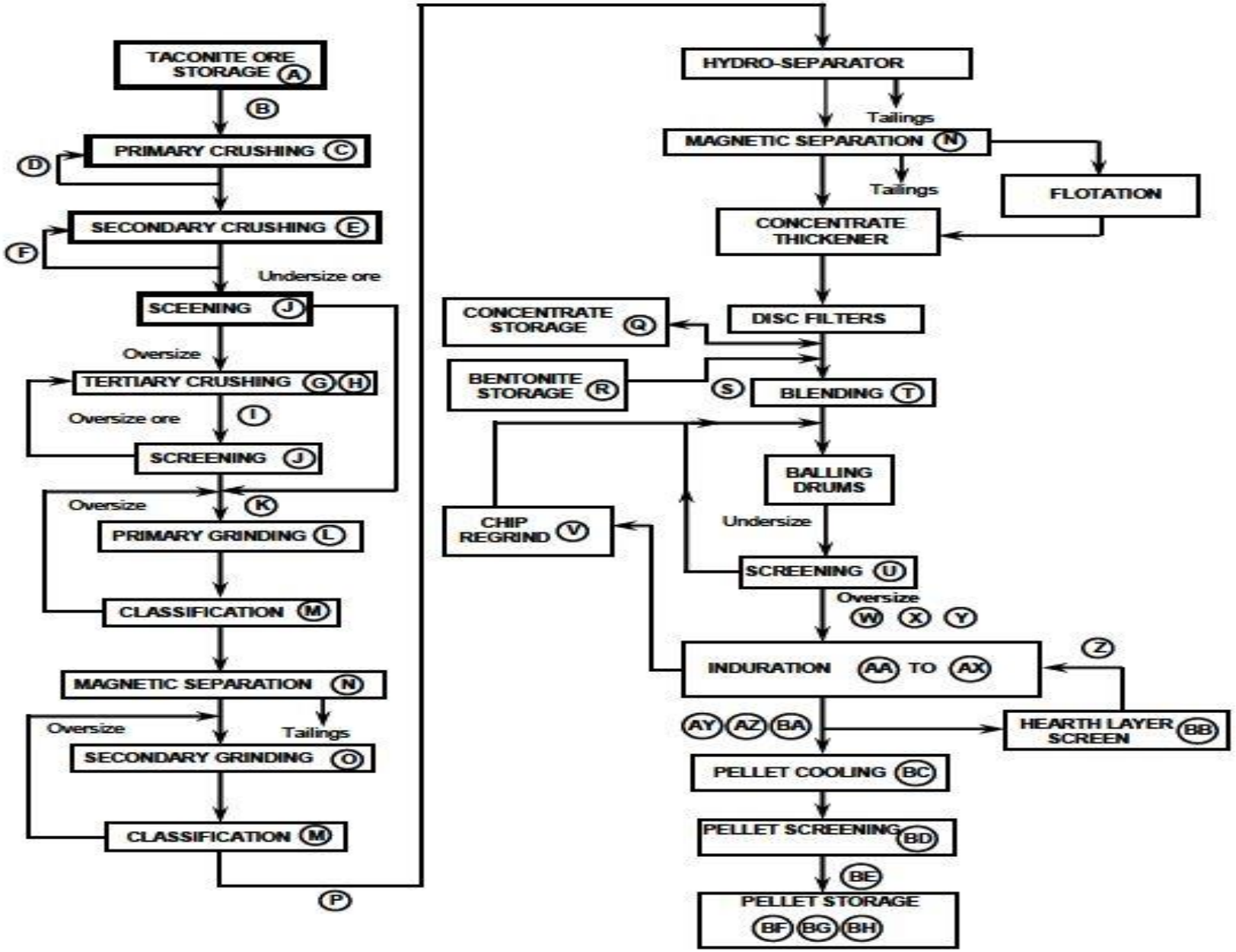
# What is Taconite Iron Ore?

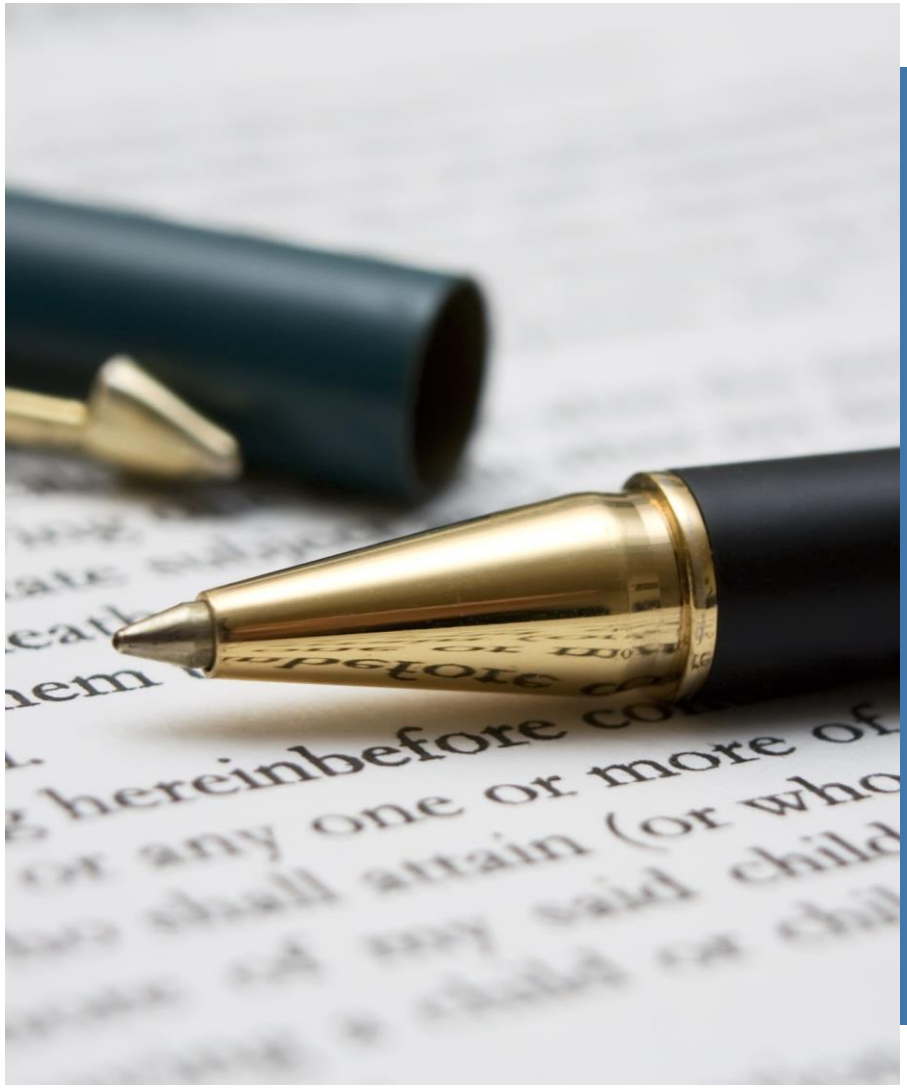
- Taconite is a low-grade iron ore mined from the Mesabi Iron Range in Northern Minnesota. Using explosives, taconite is blasted into pieces that are then crushed into smaller pieces at a processing plant. It is formed into pellets used to make iron and steel.

# AP-42 Flow Diagram Taconite Iron Ore Processing



# Taconite Iron Ore Regulations

On October 30, 2003, EPA finalized the National Emission Standards for Hazardous Air Pollutants (NESHAP) to reduce emissions of toxic air pollutants (HAPs) from taconite iron ore processing facilities. Toxic air pollutants, or air toxics, are those pollutants known to cause cancer or other serious health effects.




Final rule focused on controlling air toxic emissions from:

- Ore crushing and handling
- Ore drying
- Finished pellet handling
- Indurating furnaces
- Fugitive Dust Emissions

90 % of all HAPs emitted from a taconite iron ore processing (TIOP) facility come from the indurating furnaces where the taconite pellets are hardened

# Summary of the 2003 Regulations

The final rule includes:

- Particulate matter (PM) emission limits
- Operating limits for control devices
- Work practice standards for fugitive dust
- Good combustion practices (GCP) for formaldehyde and products of incomplete combustion (PIC)

TABLE 1 TO SUBPART RRRRR OF PART 63.—EMISSION LIMITS

| If your affected source is . . . | and the affected source is categorized as . . . | then you must comply with the flow-weighted mean concentration of particulate matter discharged to the atmosphere from the affected source, as determined using the procedures in §63.9621(b), such that you must not exceed . . . |
|---|---|---|
| 1. Ore crushing and handling emission units | Existing | 0.008 grains per dry standard cubic foot (gr/dscf). |
| | New | 0.005 gr/dscf. |
| 2. Straight grate indurating furnace processing magnetite | Existing | 0.01 gr/dscf. |
| | New | 0.006 gr/dscf. |
| 3. Grate kiln indurating furnace processing magnetite | Existing | 0.01 gr/dscf. |
| | New | 0.006 gr/dscf. |
| 4. Grate kiln indurating furnace processing hematite | Existing | 0.03 gr/dscf. |
| | New | 0.018 gr/dscf. |
| 5. Finished pellet handling emission units | Existing | 0.008 gr/dscf. |
| | New | 0.005 gr/dscf. |
| 6. Ore dryer | Existing | 0.052 gr/dscf. |
| | New | 0.025 gr/dscf. |

# Residual Risk and Technology (RTR) Review

Section 112(f) of the Clean Air Act requires that a residual risk review be conducted within 8 years of promulgation of MACT standards

Section 112(d)(6) of the CAA requires EPA to review and revise the MACT standards as necessary, taking into account developments in practices, processes and control technologies, no less often than every 8 years.

# Residual Risk Review

- 2-step risk analysis
  1. Determine if risk is acceptable considering health information only, and if not acceptable, tighten standards so risks are acceptable
  2. Determine if standards provide an ample margin of safety, which considers health information, costs, and feasibility
- In order to conduct the risk review, EPA develops a risk modeling file that contains detailed information regarding emissions of hazardous air pollutants, emission point locations, and stack parameters
  - EPA often collects information from sources in the category and provides opportunities to review risk assessment inputs
- Risk review includes an assessment of cancer and non-cancer risk due to inhalation of HAP, as well as risk screens designed to assess multipathway, whole facility, acute and environmental risks
  - Can perform refined multipathway assessments in limited cases if screens show potential multipathway human health risk (Dioxins and Furans (D/F, mercury, etc.)

# Examples of Risk Assessment Outputs

- Chronic Risk
  - Maximum Individual Risk (MIR) – highest cancer risk (in 1 million) at a location where people live (census block centroid or nearest residence)
  - Hazard Index (HI) – highest noncancer hazard at a location where people live (census block centroid or nearest residence)
- Acute Risk
  - Maximum off-site impact – pollutant-specific highest 1-hour Hazard Quotient (HQ) outside estimated facility fence line
- Environmental Risk
  - Screening tool estimates concentrations of selected HAP in environmental media and compares those concentrations to established benchmarks

# Technology Review

- Technology review takes into account ~~new~~ developments in practices, processes and control technologies considering cost and feasibility
  - The technology review looks at both new developments and improvements in old technologies
  - We often collect information from sources in the category to inform our technology review
  - The options for reducing emissions evaluated under the technology review are typically the same options evaluated under the ample margin of safety portion of the risk review
- We also address previously unregulated processes and HAP, and we make technical corrections

# Taconite Residual Risk and Technology (RTR) Review

- Based on the results of the 2020 RTR final rule, we concluded risks were acceptable and the current NESHAP provides an ample margin of safety.
  - Cancer maximum individual risk (MIR) was estimated to be 3-in-1 million, driven by arsenic and nickel from fugitive dust and indurating emissions.
  - All the chronic and acute noncancer risk estimates were below levels of concern

Furthermore, we did not identify any developments in practices, processes and control technologies.

# 2020 RTR Amendments

EPA did not make any amendments to the emissions limits due to the RTR process. However, EPA

- Added electronic reporting requirements;
- Removed the exemptions for periods of startup, shutdown and malfunction (SSM) consistent with a 2008 Court decision;
- Made minor technical corrections and modifications to monitoring and testing requirements; and
- Finalized our finding that the amphibole elongated mineral particulate (EMP) does not meet the definition of a hazardous air pollutant (HAP) and, therefore, should not be directly regulated under the NESHAP.

# LEAN v. EPA (Pulp and Paper RTR/CAA 112(d)(6) Litigation)

- On April 21, 2020, the D.C. Circuit held that EPA has an obligation to address unregulated emissions from a source category when the Agency conducts the 8-year technology review under CAA 112(d)(6).
- EPA is currently required to complete a final rule to address unregulated HAP by a court ordered deadline of November 2023.
- To inform this upcoming rulemaking, EPA recently completed a draft section 114 Questionnaire and testing request for stakeholders to review. In summary, the ***draft testing plan and requirements*** are as follows:
  - Send the section 114 request to all 7 operating Taconite facilities.
  - Require testing of at least one or more representative furnaces at each of the 7 facilities to account for use of different fuels and/or production of different types of pellets (e.g., flux vs standard pellets).
  - Test for HAP metals, D/F, PAHs, total hydrocarbons and acid gases.
  - The draft section 114 request also includes a survey which asks many questions regarding the processes, production, input materials, controls, and monitoring.

# What's Next?

## EPA Action

- Finalize the 114 Request
- Review & analyze data
- Propose MACT standards – Late 2022
- Finalize Rule – November 2023

| Industry Action | Draft Due Date |
| --- | --- |
| Submit test plan to EPA | Mid-November |
| Commence testing | Within 60 days of test plan approval |
| Submit test report to EPA | Within 60 days of completing testing |

# Questions