Miscellaneous Wood Products Process Units - Emission Characteristics and Implications

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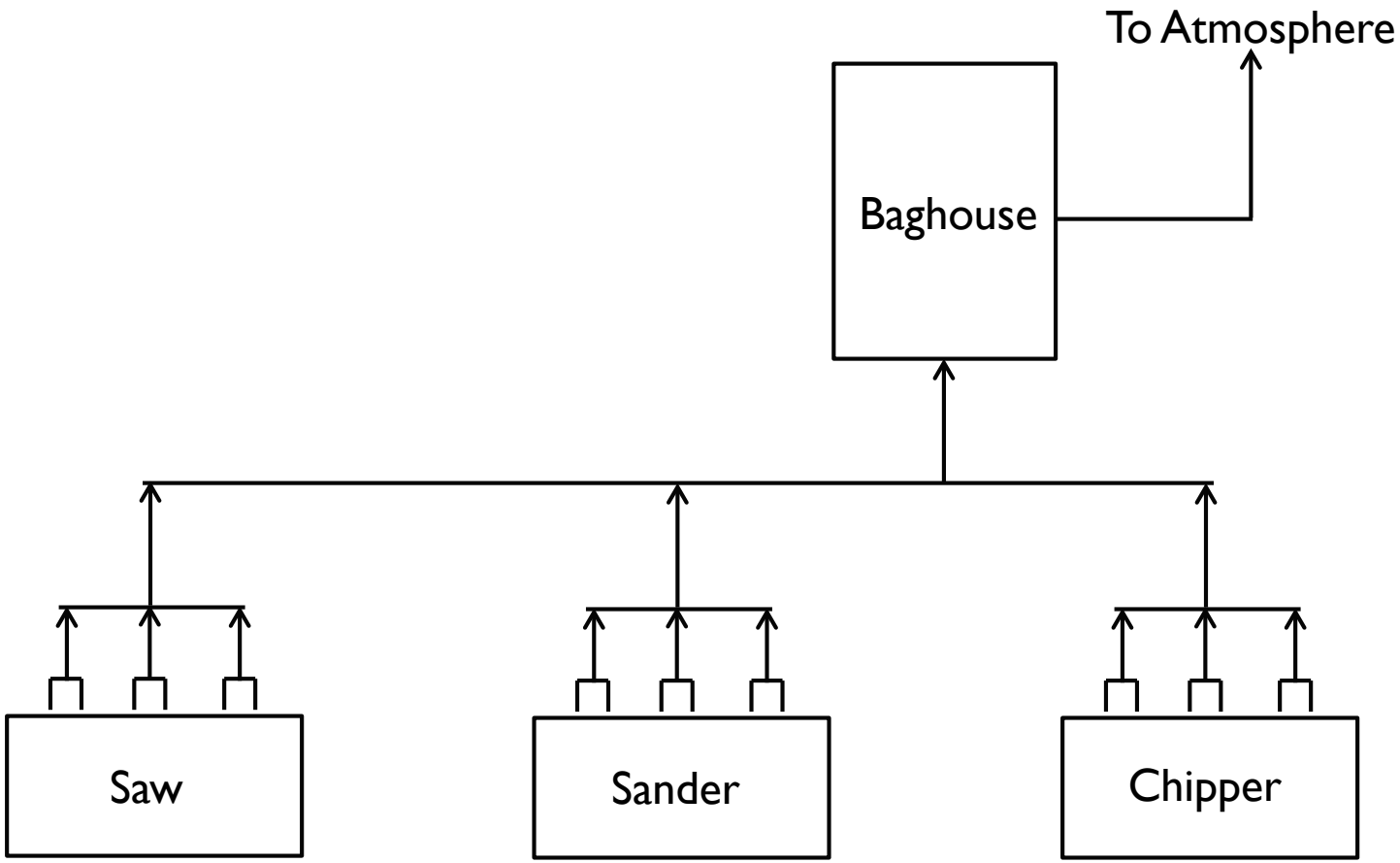
Why the Need to Better-Understand Miscellaneous Process Units?

- Operational characteristics
  - Miscellaneous process units are typically not isolated from other process units
    - Collocated sources share common dust-collection system
    - Building air / fugitives often picked up with source emissions
- Emission Characteristics
  - Miscellaneous process unit emissions are highly variable
    - Different products and resin formulations
    - Different wood species and characteristics
      - Seasonal variability in emissions
    - Variable characteristics of dust collection systems
  - Miscellaneous process unit emissions are relatively small
  - Miscellaneous process units are difficult to test

Why the Need to Better-Understand Miscellaneous Process Units? (Contd.)

- Assess feasibility of quantifying emissions from miscellaneous "source types"
  - Variability in emissions and differing process configurations make it difficult to quantify emissions for a "source-type"
- Build the case for work practices as an alternative to emission standards using the following
  - Operational and Emission characteristics from the NCASI Miscellaneous Source Survey
  - NCASI Wood Products Emission Factor Database
  - Recent NCASI test results

Collocated Sources with a Common Dust Collection System – An Example



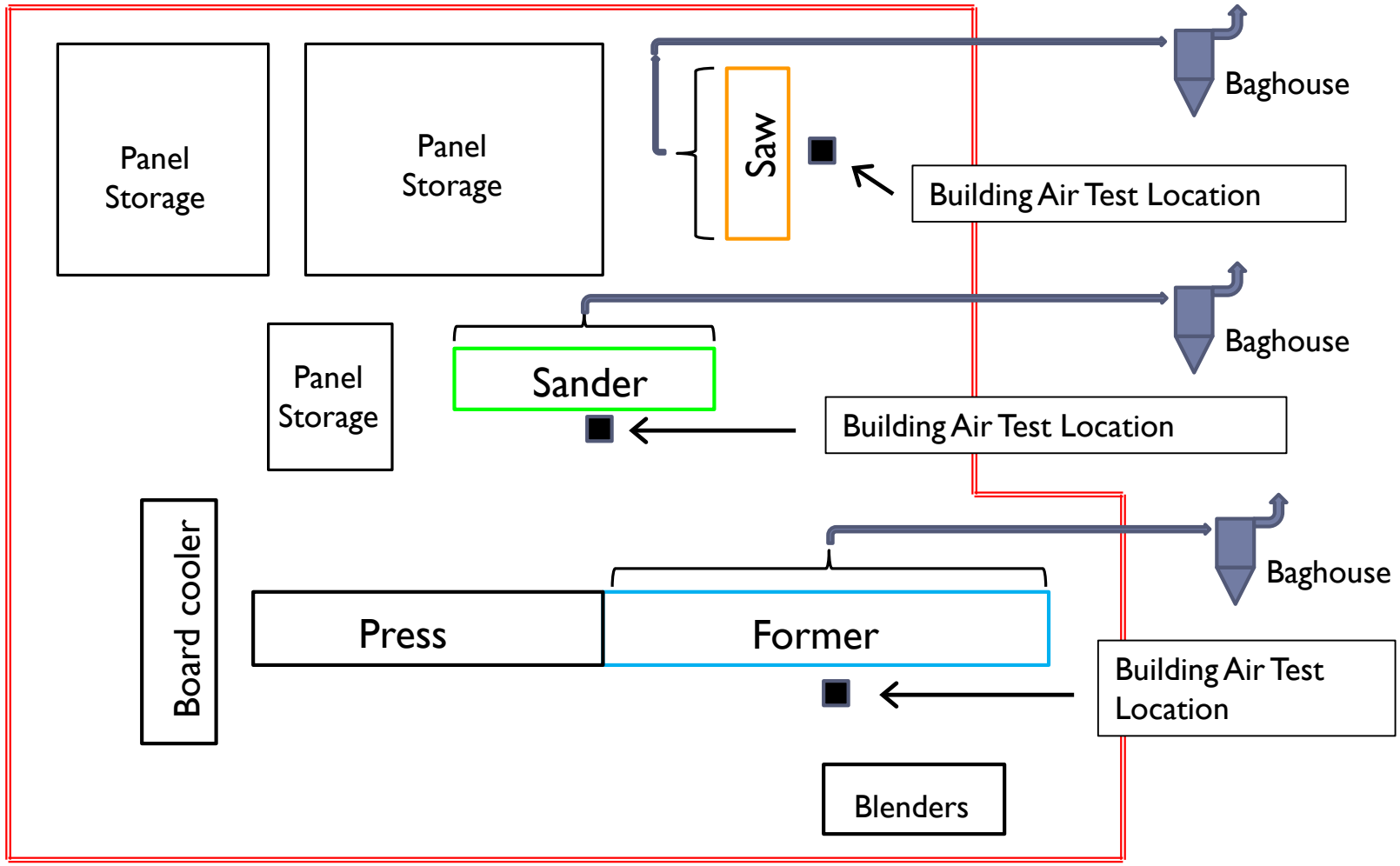
Collocated Process Units at OSB, MDF and Particleboard Mills – NCASI Survey Responses

Process Unit	Total Units	Number of Process Units Shown on the Left with the Process Units Shown Below in the Same Building				
		Blenders	Formers	Presses	Board Coolers	Other
Panel Cutting Saw	537	203	264	227	144	164
Blenders	102	42	54	38	18	18
Formers	49	12	17	28	14	14
Board Coolers	27	15	11	12	6	15
Sanders	56	18	18	18	28	30
Chippers	120	27	29	28	16	39

NCASI Study on Building Air and Emissions from Multiple Sources

- Tests at one MDF and one Particleboard Mill
  - Formers
  - Sanders
  - Saws
- For each process unit, simultaneously test at two locations
  - Dust collection system baghouse emissions
  - Building air in the vicinity of the dust collection system vacuum pickups

NCASI Study on Building Air and Emissions from Multiple Sources (Contd.)



Building Air Concentrations in Process Unit Areas

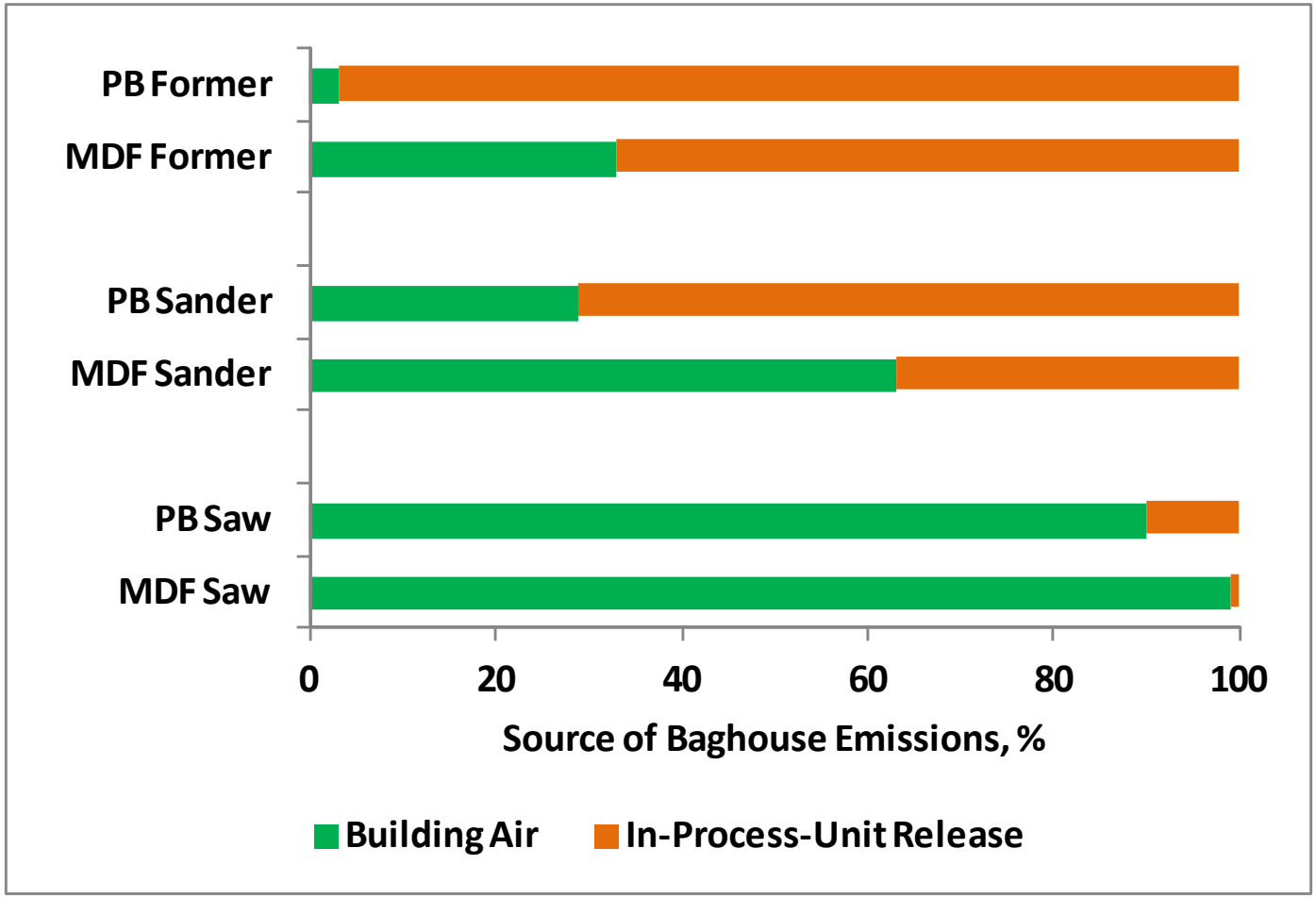
Process Unit Area	Building Air Concentration, ppbv			
	MDF Mill A		Particleboard Mill B	
	Methanol	Formaldehyde	Methanol	Formaldehyde
Former	258	115	209	229
Sander	298	35	51	67
Saw	348	51	224	89

Background ambient air

< 10 ppb methanol

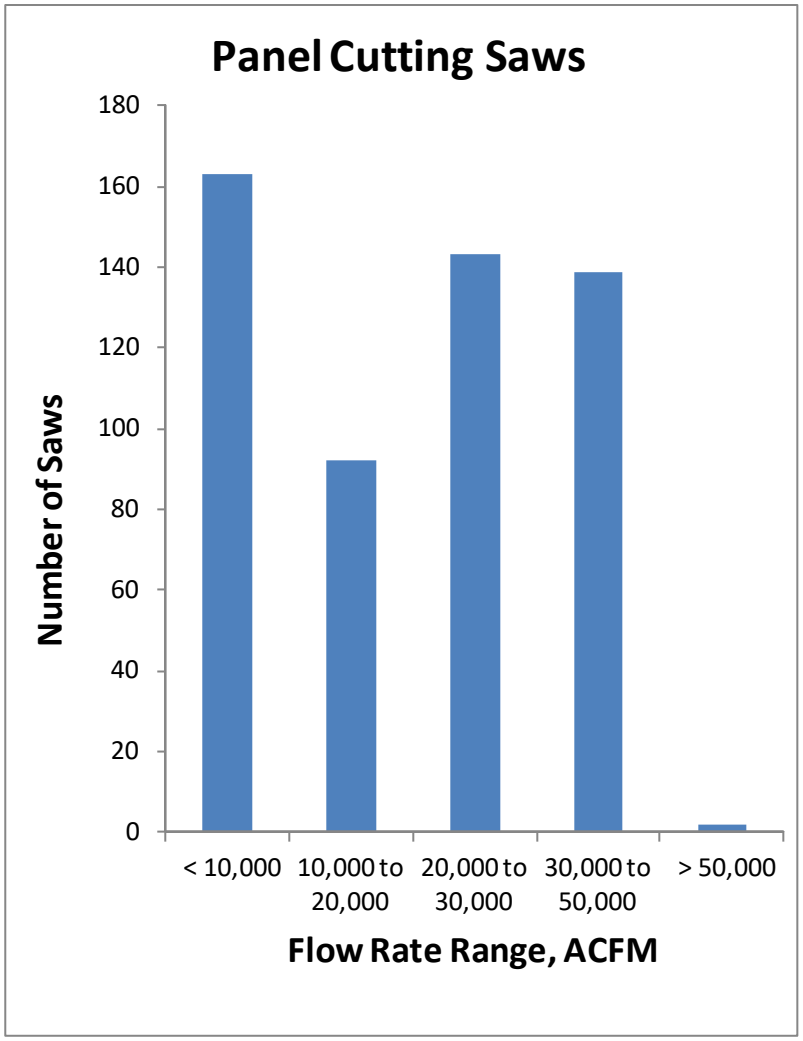
< 2 ppb formaldehyde

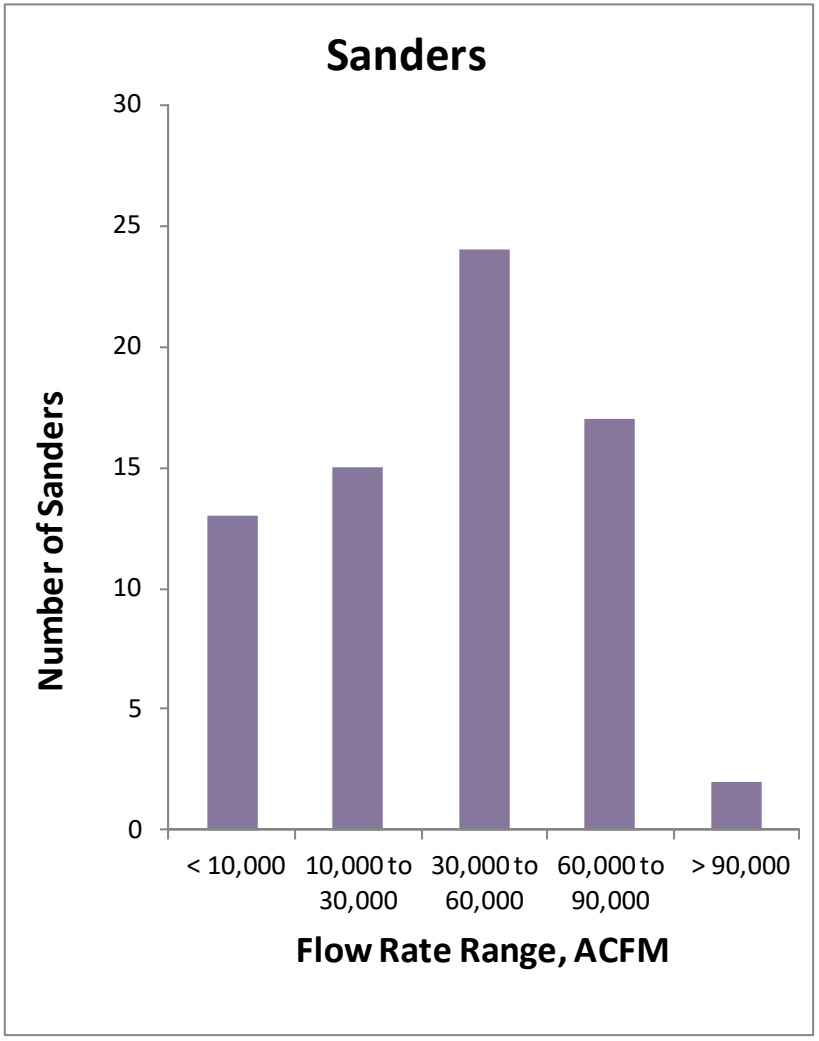
Comparison of Building Air Fugitives to Process Unit HAP Emissions



Variability in Collecting Process Unit Emissions via Pneumatic Dust Collection Systems

Variability: Flow Rates from Dust Collection Systems – Post-Press Process Units (from NCASI Survey)

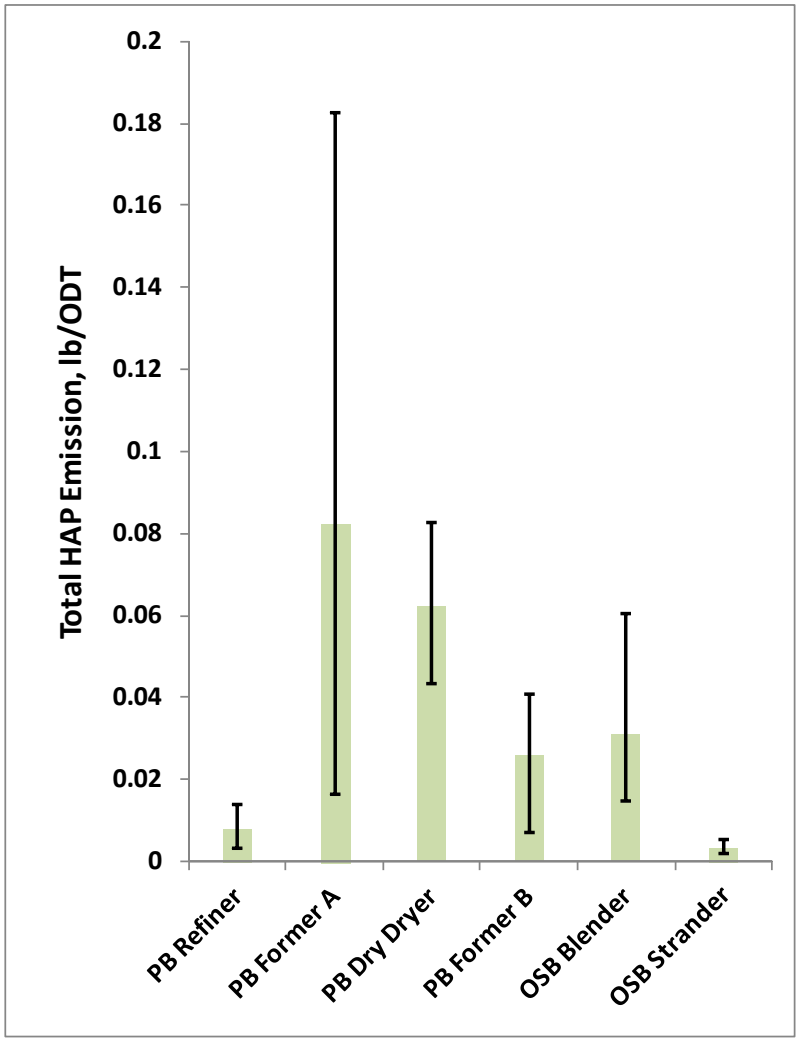




Emissions Variability

Miscellaneous Process Unit Emissions over One Year

- Four test periods
  - Winter
  - Spring
  - Summer
  - Fall
- Individual source temporal and seasonal variability



Miscellaneous Process Emissions are Relatively Small

- Pre-MACT Data
- Miscellaneous process unit emissions compared to average of all uncontrolled dryer and press emissions for OSB, PB and MDF
- Emissions for miscellaneous process units were averaged across all product types

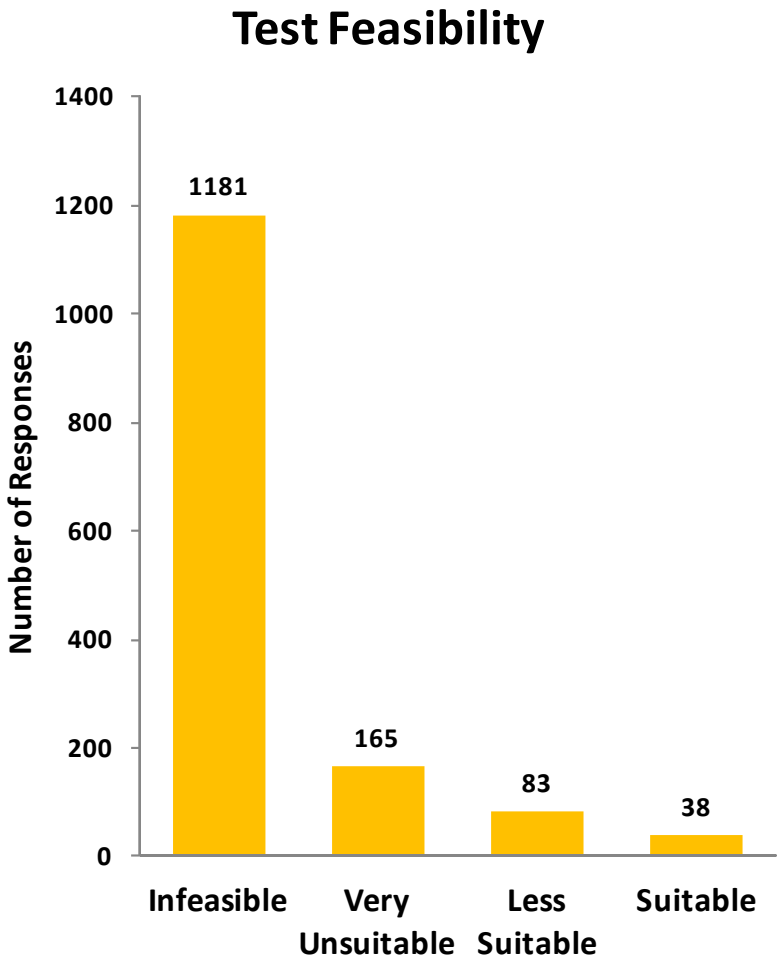
Source	HAP Emissions as Percentage of the Average Emission Rate for All Uncontrolled Dryer and Press Emissions
Blenders	26.6%
Formers	21.5%
Board Coolers	9.0%
Dry Rotary Dryers	7.6%
Plywood Presses	5.4%
Atmospheric Refiners	2.4%
Sanders	1.4%
Saws	1.0%
Chippers	0.04%

Miscellaneous Process Units are Difficult to Test

Potential Question Responses	Test Location Characteristics		
	Test Ports	Access	EPA Method 1 Criteria*
Suitable	Yes	Easy	Yes
Less Suitable	No	Difficult	Yes
Unsuitable	No	Difficult	No
Infeasible	No	Infeasible**	No

* At least four stack diametes downstream and two diameters upstream

** Sampling location is not accessable and/or untestable

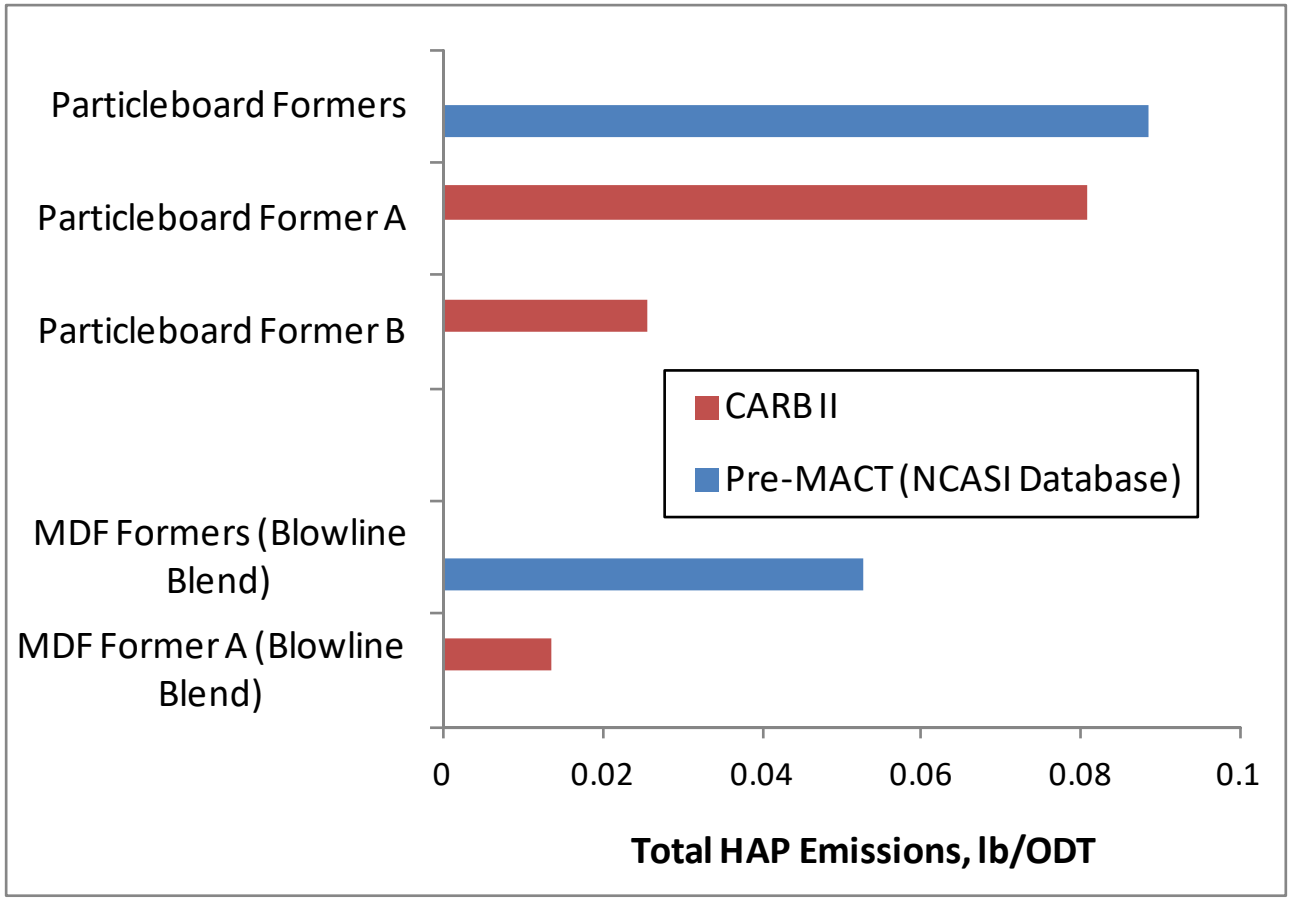


Reported In-Place Operational Changes at OSB, MDF and Particleboard Mills

Process Unit	Total No.Process Units	No. Process Units with Practice	Reported In-Place Practice
Saws	717	110	Resin Reformulation or Change
Sander	79	31	Resin Reformulation or Change
Atmospheric Refiners	38	38	none
Chipper	223	13	Resin Reformulation or Change
Storage Tanks	323	2	Resin Reformulation or Change
		26	Temperature Control
Blenders	102	33	Resin Reformulation or Change

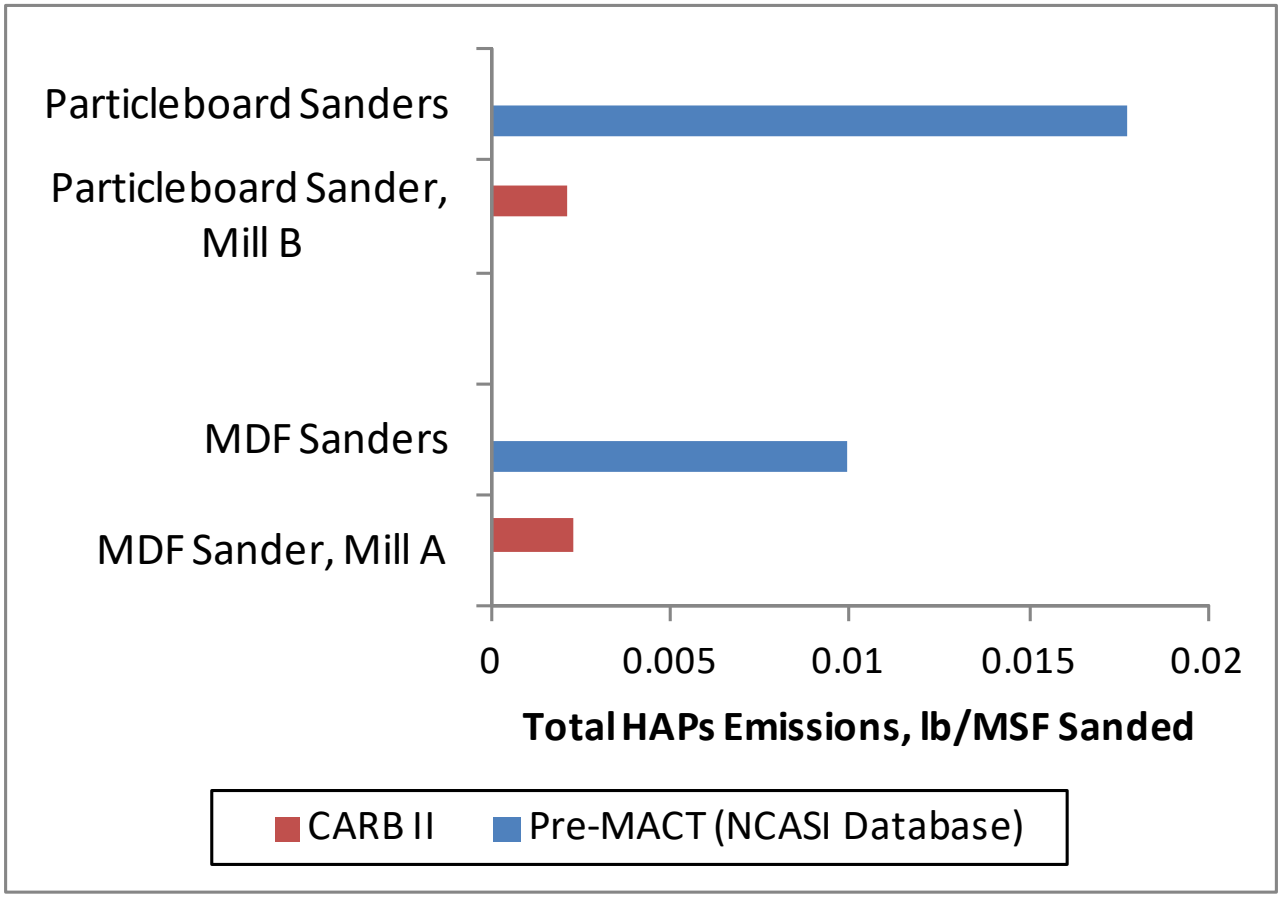
Data Relative to Resin Reformulation or Change

Particleboard and MDF Formers



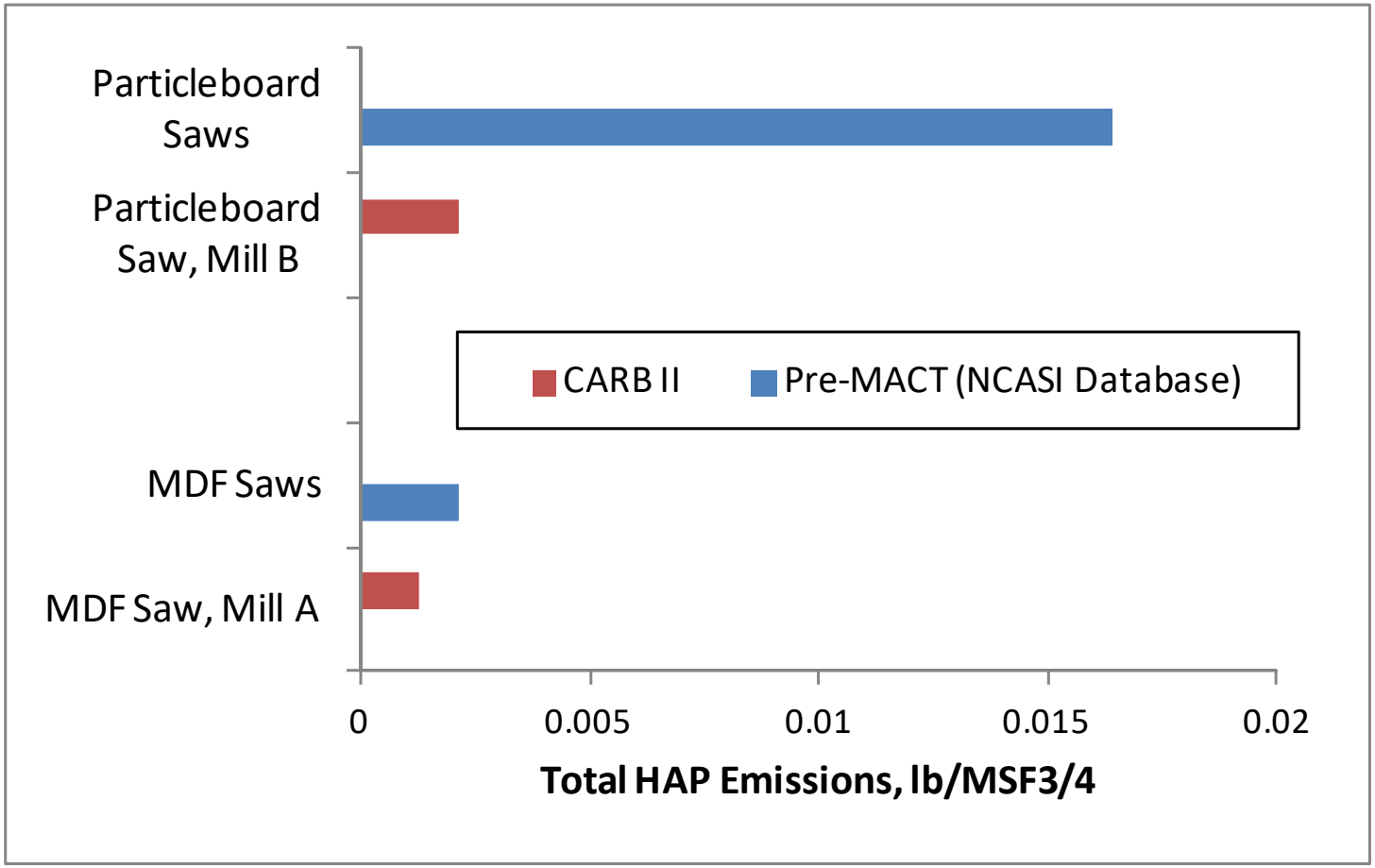
Data Relative to Resin Reformulation or Change

Particleboard and MDF Sanders



Data Relative to Resin Reformulation or Change

Particleboard and MDF Saws



Emission Characteristics of Miscellaneous Process Units – Implications on Setting MACT Standards

- Data support work practices as opposed to numeric limits
  - Dust collection systems not designed for quantitative capture of individual process unit HAPs
    - Interconnectivity of ducting between process units
    - Variability in HAPs capture between dust collection systems
    - Capture of fugitive emissions from other sources
    - Highly variable emissions
  - HAP emissions small in comparison to major sources
  - Miscellaneous process units generally infeasible for emissions testing
- Data suggest in-place standards for control of post-production panel formaldehyde off-gassing (CARB II) reduce total HAP emissions from the production process

Questions?