

## Animal Feeding Operations: Air Consent Agreement and National Air Emissions Monitoring Study



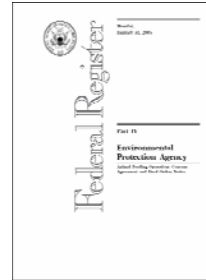
### *Agreement Overview*

- EPA & USDA asked National Academy of Science (NAS) to conduct the AFO air emissions study
- NAS study conclusions:
  - No reliable emission factors for AFO exist
  - Additional data needed to develop estimating methodologies
  - Current methods for estimating emissions not appropriate
  - Use process-based approach
- Consent agreement developed in response to:
  - Public concerns
  - NAS report
- Consent agreement developed by:
  - EPA
  - Industry representatives
- Proposed agreement coordinated with:
  - Agricultural industry representatives
  - State & local government officials
  - Environmental organizations
  - Citizen groups

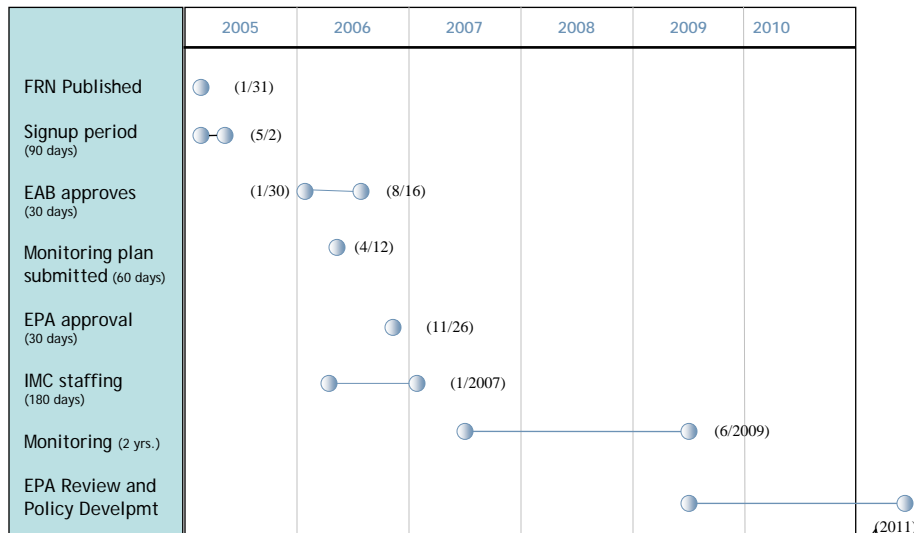


## Agreement Overview (cont)

- What is the Agreement? Voluntary consent agreement open to contract growers and integrators. Industry agrees to pay to conduct emissions testing. Targeted AFO sectors:
  - Swine
  - Poultry
    - Layers
    - Broilers
    - Turkey
  - Dairy
- Federal Register Notices:
  - Signed on Jan. 21, 2005
  - Published on Jan. 31, 2005 (70 FR 4958)
  - "Initial" public comment period closed on March 2, 2005
  - Re-opening comment period from April 1 through May 2, 2005
  - Extending signup period to July 1, 2005
- Information available at:
  - [www.epa.gov/fedrgstr](http://www.epa.gov/fedrgstr)
  - [www.epa.gov/airlinks/airlinks3.html](http://www.epa.gov/airlinks/airlinks3.html)
  - [www.epa.gov/compliance/resources/agreements/caa/cao-agr-0501.html](http://www.epa.gov/compliance/resources/agreements/caa/cao-agr-0501.html)

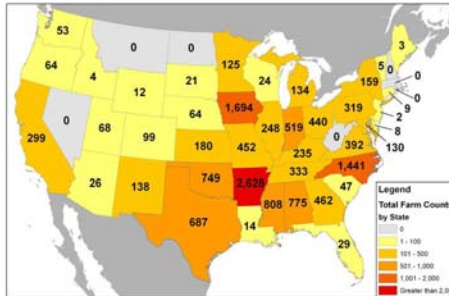
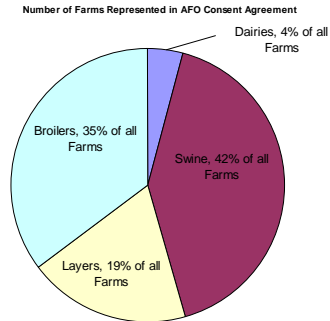


## NAEMS Timeline



## Monitoring Study - Signups

- EPA received approximately 2,700 agreements representing over 13,000 farms.



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## Monitoring Study - Overview

- Purpose: gather data for developing emission estimating methodologies
- Funding provided by participating AFO
- Monitor for:
  - Particulate matter
  - Hydrogen sulfide
  - Volatile organic compounds
  - Ammonia
- Monitoring to begin in spring/summer 2007 and continue for 2 years
- Data made available to the public



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## Monitoring Study – Site Selection

- Focuses on three AFO sectors
  - Swine
  - Poultry
  - Dairy
- Types of operations
  - Sow, nursery, finisher (swine)
  - layers, broilers
  - Dairy
- Manure Management Techniques
  - Liquid system
  - Solid system
- Regional representation
- Proximity to principal investigators



## National Air Emissions Monitoring Study



## Monitoring Study – Work Plan Development

- EPA has approved the monitoring plan & sites:
  - Approved on November 29, 2006
  - Plan included:
    - Quality Assurance Project Plans (1 each for lagoons and barns)
    - Standard Operating Procedures (76 unique SOP's)
  - 24 monitoring sites approved
- Monitoring underway Summer '07



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## Monitoring Study – The Challenges

Changing Climatic Conditions



Partially Enclosed and Naturally Ventilated



Animal Movements



Large Open Sources



Changing Feed Rations



## Monitoring Study – Overcoming The Challenges

- Changing Climatic Conditions
  - Regional Representation
  - Continuous Monitoring
  - Heated Sampling Lines
- Partially Enclosed and Naturally Ventilated Structures
  - Numerous Emission Sampling Points
  - Multiple meteorological sampling points
  - Monitor Mostly Mechanically Ventilated Buildings
- Large Open Sources
  - Use Open-Path Measurement Techniques (\$\$\$)
  - Monitor on a quarterly basis to keep cost down
- Changing Feed Rations
  - Sample Feed
  - Continuous Monitoring
- Animal Movements
  - Attempt to track animals electronically
  - Continuous Monitoring



## Summary of NAEMS Sites

Species	Barns per Site			Total Number		Number of Area Sites			
	2-barns	3-barns	4-barns	Sites	Barns	Corrals	Lagoons	Basins	Total
Swine	0	4	1	5	16	0	5	1	6
Dairy	3	2	0	5	12	1	3	0	4
Layers	2	0	1	3	8	0	0	0	0
Broilers	2	0	0	2	4	0	0	0	0
<b>Total</b>	7	6	2	15	40	1	8	1	10

## Progress at Barn Sites

Site	Contract	OFIS	DAQ	Race Ht	On-line	Internal Audit	EPA Audit	Manure Sampling	Data Sensors	
									On-line	Total
CA1B	-	✓	✓	✓	✓	✓	-	-	113	126
CA2B	-	✓	✓	✓	✓	✓	-	-	94	110
IN2B	✓	✓	✓	✓	✓	✓	✓	✓	181	411
NC2B	✓	✓	✓	✓	✓	✓	-	-	138	140
IN3B	✓	✓	✓	✓	✓	✓	✓	-	146	152
NC3B	✓	✓	-	-	✓	-	-	-	0	96
NC4B	✓	✓	✓	-	✓	-	-	-	12	109
IA4B	-	✓	✓	✓	✓	✓	-	-	147	147
OK4B	-	✓	✓	✓	✓	✓	-	-	119	122
CA5B	✓	✓	✓	-	-	✓	-	-	225	233
IN5B	✓	✓	✓	-	✓	✓	✓	-	119	186
NY5B	-	✓	✓	-	✓	-	-	-	62	116
WA5B	-	✓	-	-	-	-	-	-	181	214
WI5B	✓	✓	✓	✓	✓	✓	-	-	120	121
<b>Totals</b>									1657	2283

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## Progress at Area Sources

Location	Layout	Concrete and tower bases installed	Towers erected	Electrical service	Measurements
IN4A	✓	✓	✓	Installed	In Period 1
NC3A				Installed	
NC4A	✓	✓	✓	Installed	
OK3A	✓	✓	✓	Installed	In Period 1
OK4A	✓	✓	✓	Installed	Period 1 complete
TX5A	✓	N/A	N/A	Underway	
WA5A	✓	✓	✓		
WI5A	✓	✓	✓	Installed	Period 1 complete
IA3A	✓	✓	✓	Installed	In Period 1
IN5A*	2008	2008	2008	2008	2008



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## What's Next?

- Complete Setup of all Sites
- Data collection – Spring/Summer/Fall 07 + 2 years
- Complete data analysis and publish Emission Estimating Methodologies – 18 months after completion of data collection
- Participants must comply with any applicable requirements – 120 days after publication of Emission Estimating Methodology

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## Other Projects

<i>Principal Investigator</i>	<i>Topic/Sponsor</i>	<i>Site(s)</i>
Jacobson	Odor Emissions/USDA NRI	IA4A, OK4A, IN5B, & WI5B
Mitloehner	VOCs & GHGs/CA Dept Food & Ag, Dairy	CA5B
Lim	Downwind Dairy Odor Survey/Purdue	IN5B
Ni	Air Emissions/USDA NRI	IN2B
Koziel	GHG/ISU	IA4B

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## Goals for Next 2-3 Years

- Settle issues of CAA requirements
  - Emission estimation (e.g., emission factors, potential to emit)
  - Source definition
  - Applicability cutoff (i.e., size cutoff)
  - Fugitive/non-fugitive
  - Control technology effectiveness
  - Monitoring, reporting and recordkeeping