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## USDA Natural Resources Conservation Service Science and Technology

### 2015 Conservation Webinars



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Date	2015 Conservation Webinars Topics
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Aug 11	Using the National Air Quality Site Assessment Tool for Air Quality Conservation Planning at Dairies
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Aug 12	Using the National Air Quality Site Assessment Tool for Air Quality Conservation Planning at Swine Operations
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Aug 13	Using the National Air Quality Site Assessment Tool for Air Quality Conservation Planning at Poultry Operations
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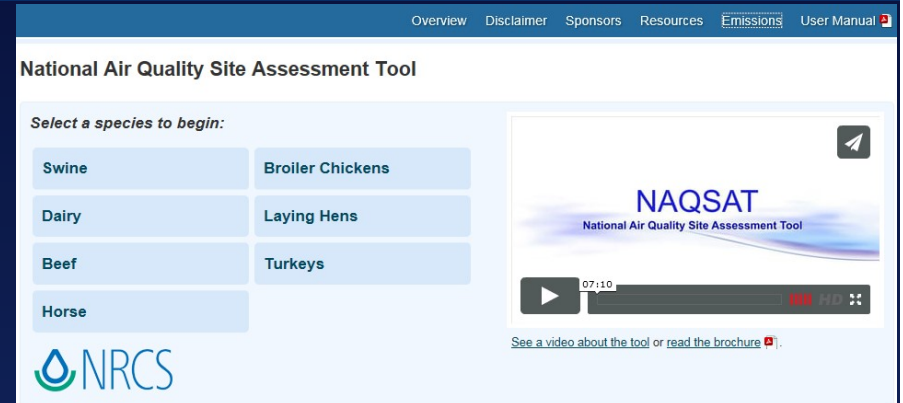


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# NAQSAT Overview

August 11-13, 2015

Greg Zwicke, Air Quality Engineer – NRCS AQAC Team  
Shawn Archibeque, Associate Professor – Colorado State University

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# What is NAQSAT?

- National Air Quality Site Assessment Tool
- <http://naqsat.tamu.edu>
- Developed for:
  - Livestock producers at confined animal operations
  - Advisors for these producers
  - Conservation planners
- Intended to provide assistance in identifying areas at confined animal operations where there are opportunities to address air emissions

# Who Developed NAQSAT?

- Developed and enhanced under two CIG projects
  - “Development of a National Air Quality Site Assessment Tool (NAQSAT)”
    - Michigan State University – CIG 69-3A75-7-118
  - “Enhancement of a National Air Quality Site Assessment Tool (NAQSAT) for Livestock Producers”
    - Colorado State University – CIG 69-3A75-11-220

# Who Developed NAQSAT?

- University partners
  - Colorado State University
  - Iowa State University
  - Michigan State University
  - Oregon State University
  - Penn State University
  - Purdue University
  - Texas A&M University
  - University of California – Davis
  - University of Georgia
  - University of Maryland
  - University of Minnesota
  - University of Nebraska
- Industry Partners
  - Colorado Livestock Association
  - Iowa Turkey Federation
  - Iowa Pork Producers Association
  - Iowa Pork Industry Center
  - La Luna Dairy
  - Michigan Milk Producers Association
  - Michigan Pork Producers Association
  - National Pork Board
  - Nebraska Environmental Trust
  - Western United Dairymen

# How Will NRCS Use NAQSAT?

- See updated NRCS National Instructions 190-309 (July 2015)
- Required for confined livestock and poultry operations with  $\geq 300$  AU
  - Swine
  - Dairy
  - Beef
  - Horse
  - Broiler chickens
  - Laying hens
  - Turkeys

# How Will NRCS Use NAQSAT?


- Prepare a baseline NAQSAT report
  - Represents current management of the operation
- Use baseline results to help inform air quality resource concern identification
  - NAQSAT will not give you the answer – it will only point you in the right direction
- Continue through the planning process to formulate alternatives
- Evaluate alternatives by changing baseline NAQSAT run



# NAQSAT Demo - Poultry

August 13, 2015

▲ **Animals and Housing**

**Note to User:** Many farms may use more than one of the listed choices below. In order to allow the use of NAQSAT as a "What If" tool only one of the choices can be selected at a time. The user can click on "Get Results" for that selection and see how changing the answer will affect their results. **See user's manual for more information.**  If only a general overview is desired, identifying the predominant practice will accomplish that result.

**For broilers, what is your average market weight per year?**

- Unknown
- 2.0 to 3.5
- 3.5 to 4.5
- 4.5 to 5.2
- 5.2 to 6.0
- 6.0 to 7.0

**What is your average feed conversion for the year (lbs feed to lbs gain)?**

- < 1.6
- 1.6 to 1.75
- 1.75 to 1.95
- 1.95 to 2.1
- > 2.10

- > 7.0

**Housing type:**

- Curtain

**What mitigation strategies are used with your housing?**

- Vegetative buffer
- Exhaust ducting
- Scrubber
- Dispersion walls
- Attic inlets
- Ceiling fans
- Litter amendments
- None

**Do you fog or sprinkle?**

- Yes

**Are you wetting your floor when you fog?**

- Yes
- No

- No

- Tunnel

- Natural (Outside access)

## Feed and Water

**Do you have control or input into diet formulation?**

- Yes
- No

**Do you make your own feed or process your feed onsite?**

- Yes
- No

**How is water supplied to your animals in the curtain facility?**

- Nipple drinkers
- Trough, cups, bowls, or bells

**How often are all waterers checked then repaired for leaks?**

- Daily
- At least weekly
- Weekly or less frequently


**How often are your waterers flushed?**

- End of flock or between flocks
- More than once per flock
- Less than once per flock



**Save Progress**

## ▲ Collection and Transfer

**Note to User:** Many farms may use more than one of the listed choices below. In order to allow the use of NAQSAT as a "What If" tool only one of the choices can be selected at a time. The user can click on "Get Results" for that selection and see how changing the answer will affect their results. **See user's manual for more information.**  If only a general overview is desired, identifying the predominant practice will accomplish that result.

**How often does a complete clean-out occur?**

- More than once per year
- Yearly
- Less than once per year

**Are more than 1 flock are on the same litter?**

- Yes
- No

**What method is used to transfer the majority of manure from storage to the field?**

- Open spreader or truck

If a truck or spreader is used to transport manure to fields, is it covered (whether the truck leaves the farm and goes on a public road or not)?


- Yes
- No

- Does not apply



**Save Progress**

## Manure Storage

**Note to User:** Many farms may use more than one of the listed choices below. In order to allow the use of NAQSAT as a "What If" tool only one of the choices can be selected at a time. The user can click on "Get Results" for that selection and see how changing the answer will affect their results. **See user's manual for more information.**  If only a general overview is desired, identifying the predominant practice will accomplish that result.

Do any of these processes occur onsite? (Check all that apply)

- Storage/stockpile
- Composting

How often is seepage noticed?

- Rarely
- Commonly

Does water pond around the base of compost piles (from rainfall events or leachate) for greater than 24 hours?

- Ponding or standing water is not present more than 24 hr after a rainfall event
- Ponding or standing water is present more than 24 hr after a rainfall event

What is average of the highest two consecutive weekly temperature readings of your compost pile?

- I don't know
- < 120F
- 120F to 140F
- > 140F


How often are maggots or flies noticed?

- Rarely
- Commonly

- Pelletizing
- Gasification
- Incineration/burn



Save Progress

 **Land Application**

**Where does manure go?**

- Moved offsite (sold or given away) directly from the housing
- Composted or stockpiled, then sold or given away
- Land applied

**What form of manure is land applied? (Check all that apply)**

- Solid

How long are solids piled, or staged, on the field prior to application?

- < 3 days
- $\geq$  3 days

Are solids covered?

- Yes
- No

Is there ponded leachate?

- Yes
- No

- Directly land applied; not piled or staged

Are the majority of your solids composted prior to land application?

- Yes
- No

- Liquid



**Save Progress**

▲ **Mortalities**

**How long before carcasses are picked up or put into the disposal system?**

- Daily
- Less frequently

**How is mortality handled? (Check all that apply)**

- Managed offsite (such as rendered or landfilled, or offsite composting)
- Buried onsite
- Composted onsite

**How often is seepage noticed?**

- Rarely
- Commonly

**Does water pond around the base of compost piles (from rainfall events or leachate) for greater than 24 hours?**

- Ponding or standing water is not present more than 24 hr after a rainfall event
- Ponding or standing water is present more than 24 hr after a rainfall event

**Are you following a specific compost recipe?**

- Yes

**What is your recipe?**

- > 3:1 parts litter:bird
- < 3:1 parts litter:bird

- No

**What is average of the highest two consecutive weekly temperature readings of your compost pile?**

- I don't know
- < 120F
- 120F to 140F
- > 140F

**How often are maggots or flies noticed?**

- Rarely
- Commonly

**How often are uncovered carcass parts visible or noticed?**

- Rarely
- Commonly

**How often is compost cover added?**

- Immediately after each carcass addition
- At least once daily
- Less frequently than each carcass addition

- Contained (in-vessel) incinerated onsite

## ▲ On-farm Roads

**Are unpaved roads used for any of the following activities? (check all that apply)**

- Routine service traffic (feed delivery, milk truck, renderer)
- Less frequent service traffic (manure handling)
- General transportation (veterinarians, maintenance, nutritionists, managers, employees, farm tours)
- Does not apply

**Unpaved roads are surfaced with: (Check all that apply)**

- Caliche/limestone
- Unimproved dirt road
- Washed gravel
- Gravel

**Which is the predominant road-surface treatment used?**

- Petroleum products, resins, emulsions as per manufacturer recommendations
- Salts or hygroscopic materials (e. g., magnesium chloride)
- Fresh water
- Holding pond wastewater
- None

**Are speed limits strictly enforced, or is speed controlled by passive means (e. g., speed bumps)?**

- Speed limits are not present or are not enforced by management
- Speed limits are enforced by management
- Speed is controlled by speed bumps or other passive means

**Do you restrict public access to private roads?**

- Yes
- No

**Are most roads lined with windbreaks or shelterbelts?**

- No
- Some or all roads are lined with vegetation



**Save Progress**

## Perception

**Do you employ the following to reduce nuisance issues?**

- Property line vegetative buffers
- Cleaning up spilled manure from roads
- None of the above

**Do you practice "track-out control" (manure on tires) of manure or mud on vehicles leaving the property? (Do you have a means of controlling how much manure/mud leaves your property on the tires of all vehicles leaving your property?)**

- Yes
- No

**Are most roads lined with windbreaks or shelterbelts?**

- No
- Some or all roads are lined with vegetation

**Are you mindful of neighbors when timing manure removal from housing or storage?**

- Yes
- No

**Do you consider how the following impact nuisance conditions when planning manure applications?**

- Timing relative to neighbor activities
- Time of day
- Season
- Weather forecasts (wind direction relative to neighbor location)
- None of the above


**Are compost piles, mortalities, or manure storage visible from public roads?**

- Yes
- No

**Are efforts made to ensure a pleasing roadside appearance?**

- Yes
- No

## Effectiveness Results:

(Close / Go Back) 

Width of white box identifies room for improvement to reduce emissions within each constituent of concern.

More white area signifies greater opportunities to make changes and reduce air emissions.

Click the box to view practice standards applicable to your scores.

Click on a management category to quickly modify your answers.

Management Category	Odor	Particulate Matter (Dust)	Ammonia (NH <sub>3</sub> )	Hydrogen sulfide (H <sub>2</sub> S)	Methane (CH <sub>4</sub> )	Volatile organic compounds (VOCs)	Nitrous Oxide (N <sub>2</sub> O)
Animals and Housing				N/A	N/A	N/A	N/A
Feed and Water		N/A		N/A	N/A	N/A	N/A
Collection and Transfer							N/A
Manure Storage		N/A					
Land Application							N/A
Mortalities		N/A					N/A
On-farm Roads				N/A	N/A		N/A
Perception			N/A	N/A	N/A	N/A	N/A



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# Using NAQSAT Results

August 13, 2015

# Where Do We Start?

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Animals and Housing	<div style="width: 100%; height: 15px; background-color: #00ff00;"></div>	<div style="width: 100%; height: 15px; background-color: #00ff00;"></div>	<div style="width: 100%; height: 15px; background-color: #00ff00;"></div>	N/A	N/A	N/A	N/A
Feed and Water	<div style="width: 100%; height: 15px; background-color: #00ff00;"></div>	N/A	<div style="width: 100%; height: 15px; background-color: #00ff00;"></div>	N/A	N/A	N/A	N/A
Collection and Transfer	<div style="width: 100%; height: 15px; background-color: #00ff00;"></div>	<div style="width: 100%; height: 15px; background-color: #00ff00;"></div>	<div style="width: 100%; height: 15px; background-color: #00ff00;"></div>	<div style="width: 100%; height: 15px; background-color: #00ff00;"></div>	<div style="width: 100%; height: 15px; background-color: #00ff00;"></div>	<div style="width: 100%; height: 15px; background-color: #00ff00;"></div>	N/A
Manure Storage	<div style="width: 100%; height: 15px; background-color: #00ff00;"></div>	N/A	<div style="width: 100%; height: 15px; background-color: #00ff00;"></div>	<div style="width: 100%; height: 15px; background-color: #00ff00;"></div>	<div style="width: 100%; height: 15px; background-color: #00ff00;"></div>	<div style="width: 100%; height: 15px; background-color: #00ff00;"></div>	<div style="width: 100%; height: 15px; background-color: #00ff00;"></div>
Land Application	<div style="width: 100%; height: 15px; background-color: #00ff00;"></div>	<div style="width: 100%; height: 15px; background-color: #00ff00;"></div>	<div style="width: 100%; height: 15px; background-color: #00ff00;"></div>	<div style="width: 100%; height: 15px; background-color: #00ff00;"></div>	<div style="width: 100%; height: 15px; background-color: #00ff00;"></div>	<div style="width: 100%; height: 15px; background-color: #00ff00;"></div>	N/A
Mortalities	<div style="width: 100%; height: 15px; background-color: #00ff00;"></div>	N/A	<div style="width: 100%; height: 15px; background-color: #00ff00;"></div>	<div style="width: 100%; height: 15px; background-color: #00ff00;"></div>	<div style="width: 100%; height: 15px; background-color: #00ff00;"></div>	<div style="width: 100%; height: 15px; background-color: #00ff00;"></div>	N/A
On-farm Roads	<div style="width: 100%; height: 15px; background-color: #00ff00;"></div>	<div style="width: 100%; height: 15px; background-color: #00ff00;"></div>	<div style="width: 100%; height: 15px; background-color: #00ff00;"></div>	N/A	N/A	<div style="width: 100%; height: 15px; background-color: #00ff00;"></div>	N/A
Perception	<div style="width: 100%; height: 15px; background-color: #00ff00;"></div>	<div style="width: 100%; height: 15px; background-color: #00ff00;"></div>	N/A	N/A	N/A	N/A	N/A

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# Where Do We Start?

- Look at each AQ resource concern
  - Emissions of Particulate Matter (PM) and PM Precursors
  - Emissions of Ozone Precursors
  - Objectionable Odors
  - Emissions of Greenhouse Gases
  
  - Some may be more important for your site than others

# Particulate Matter Resource Concern

- Focus on score bars for:
  - Particulate matter
  - Ammonia

**Effectiveness Results:** (Close / Go Back) ✕

Width of white box identifies room for improvement to reduce emissions within each constituent of concern. More white area signifies greater opportunities to make changes and reduce air emissions. Click the box to view practice standards applicable to your scores. Click on a management category to quickly modify your answers.

Management Category	Odor	Particulate Matter (Dust)	Ammonia (NH <sub>3</sub> )	Hydrogen sulfide (H <sub>2</sub> S)	Methane (CH <sub>4</sub> )	Volatile organic compounds (VOCs)	Nitrous Oxide (N <sub>2</sub> O)
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Mortalities		N/A					N/A
On-farm Roads				N/A	N/A		N/A
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# Particulate Matter

- Focus on score bars for:
  - Animals and Housing
  - Onfarm Roads
  - Manure Storage – if dry manure is managed
  - Land Application – if dry manure is managed
  - Feed and Water – if dry feed ingredients are stored or mixed onsite

# Ammonia

- Focus on score bars for:
  - Feed and Water
  - Manure Storage
  - Land Application
  - Animals and Housing
  - Collection and Transfer

# Particulate Matter Resource Concern

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Land Application							N/A
Mortalities		N/A					N/A
On-farm Roads				N/A	N/A		N/A
Perception			N/A	N/A	N/A	N/A	N/A

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# Ozone Precursors Resource Concern

- Focus on score bar for:
  - Volatile organic compounds

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Land Application							N/A
Mortalities		N/A					N/A
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# Volatile Organic Compounds

- Focus on score bars for:
  - Manure Storage
  - Feed and Water
  - Animals and Housing

# Ozone Precursors Resource Concern

## Effectiveness Results:

(Close / Go Back) ✕

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On-farm Roads				N/A	N/A		N/A
Perception			N/A	N/A	N/A	N/A	N/A

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# Odors Resource Concern

- Focus on score bars for:
  - Odor
  - Volatile organic compounds
  - Hydrogen sulfide
  - Ammonia

**Effectiveness Results:** (Close / Go Back) ✕

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# Odor

- Focus on score bars for:
  - Mortalities
  - Manure Storage
  - Feed and Water
  - Land Application
  - Animals and Housing

# Volatile Organic Compounds

- Focus on score bars for:
  - Manure Storage
  - Feed and Water
  - Animals and Housing

# Hydrogen Sulfide

- Focus on score bars for:
  - Manure Storage
  - Feed and Water

# Ammonia

- Focus on score bars for:
  - Feed and Water
  - Manure Storage
  - Land Application
  - Animals and Housing
  - Collection and Transfer

# Odors Resource Concern

**Effectiveness Results:** (Close / Go Back) ✕

Width of white box identifies room for improvement to reduce emissions within each constituent of concern.  
More white area signifies greater opportunities to make changes and reduce air emissions.  
Click the box to view practice standards applicable to your scores.  
Click on a management category to quickly modify your answers.

Management Category	Odor	Particulate Matter (Dust)	Ammonia (NH <sub>3</sub> )	Hydrogen sulfide (H <sub>2</sub> S)	Methane (CH <sub>4</sub> )	Volatile organic compounds (VOCs)	Nitrous Oxide (N <sub>2</sub> O)
Animals and Housing				N/A	N/A	N/A	N/A
Feed and Water		N/A			N/A		N/A
Collection and Transfer							N/A
Manure Storage		N/A					
Land Application							N/A
Mortalities		N/A					N/A
On-farm Roads				N/A	N/A		N/A
Perception			N/A	N/A	N/A	N/A	N/A

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# GHG Resource Concern

- Focus on score bars for:
  - Methane
  - Nitrous oxide

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Management Category	Odor	Particulate Matter (Dust)	Ammonia (NH <sub>3</sub> )	Hydrogen sulfide (H <sub>2</sub> S)	Methane (CH <sub>4</sub> )	Volatile organic compounds (VOCs)	Nitrous Oxide (N <sub>2</sub> O)
Animals and Housing				N/A	N/A	N/A	N/A
Feed and Water		N/A		N/A	N/A	N/A	N/A
Collection and Transfer							N/A
Manure Storage		N/A					
Land Application							N/A
Mortalities		N/A					N/A
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# Methane

- Focus on score bars for:
  - Manure Storage
  - Feed and Water

# Nitrous Oxide

- Focus on score bars for:
  - Feed and Water
  - Manure Storage
  - Land Application

# GHG Resource Concern

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Land Application							N/A
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Perception			N/A	N/A	N/A	N/A	N/A

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# Example

- Hall County, GA – PM<sub>2.5</sub> nonattainment
- Some dust complaints
- No other issues identified

# Particulate Matter Resource Concern

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# Collection and Transfer

## Collection and Transfer

**Note to User:** Many farms may use more than one of the listed choices below. In order to allow the use of NAQSAT as a "What If" tool only one of the choices can be selected at a time. The user can click on "Get Results" for that selection and see how changing the answer will affect their results. **See user's manual for more information.**  If only a general overview is desired, identifying the predominant practice will accomplish that result.

**How often does a complete clean-out occur?**

- More than once per year
- Yearly
- Less than once per year

**Are more than 1 flock are on the same litter?**

- Yes
- No

**What method is used to transfer the majority of manure from storage to the field?**

- Open spreader or truck

If a truck or spreader is used to transport manure to fields, is it covered (whether the truck leaves the farm and goes on a public road or not)?

- Yes
- No

- Does not apply



**Save Progress**

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- No

**Check all that apply:**


- Do you till or windrow your litter between flocks?
- Do you de-cake your litter between flocks?
- Do you do nothing?

**What method is used to transfer the majority of manure from storage to the field?**

- Open spreader or truck
- Does not apply

**If a truck or spreader is used to transport manure to fields, is it covered (whether the truck leaves the farm and goes on a public road or not)?**

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# Particulate Matter Resource Concern

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# Land Application

## Land Application

### Where does manure go?

- Moved offsite (sold or given away) directly from the housing
- Composted or stockpiled, then sold or given away
- Land applied

### What form of manure is land applied? (Check all that apply)

- Solid

#### How long are solids piled, or staged, on the field prior to application?

- < 3 days
- >= 3 days

#### Are solids covered?

- Yes
- No

#### Is there ponded leachate?

- Yes
- No

- Directly land applied; not piled or staged

#### Are the majority of your solids composted prior to land application?

- Yes
- No

- Liquid



Save Progress

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# On-farm Roads

## ▲ On-farm Roads

Are unpaved roads used for any of the following activities? (check all that apply)

- Routine service traffic (feed delivery, milk truck, renderer)
- Less frequent service traffic (manure handling)
- General transportation (veterinarians, maintenance, nutritionists, managers, employees, farm tours)
- Does not apply

Unpaved roads are surfaced with: (Check all that apply)

- Caliche/limestone
- Unimproved dirt road
- Washed gravel
- Gravel

Which is the predominant road-surface treatment used?

- Petroleum products, resins, emulsions as per manufacturer recommendations
- Salts or hygroscopic materials (e. g., magnesium chloride)
- Fresh water
- Holding pond wastewater
- None

Are speed limits strictly enforced, or is speed controlled by passive means (e. g., speed bumps)?

- Speed limits are not present or are not enforced by management
- Speed limits are enforced by management
- Speed is controlled by speed bumps or other passive means

Do you restrict public access to private roads?

- Yes
- No

Are most roads lined with windbreaks or shelterbelts?

- No
- Some or all roads are lined with vegetation



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# Particulate Matter Resource Concern

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# Possible Solutions

- Collection and Transfer
  - Use bedding for more than 1 flock (i.e., don't clean out as often)
- Land application
  - Cover piled solids
- On-farm Roads
  - Surface with gravel
  - Apply water or other dust suppressant
  - Install windbreaks along roadways

# NAQSAT Resources Page

- <http://naqsat.tamu.edu/resources.aspx>



The screenshot shows a web browser window titled "National Air Quality Site Assessment Tool - Internet Explorer". The address bar displays "http://naqsat.tamu.edu/resources.aspx". The page content is organized into sections with expandable/collapsible headers:

- Additional Resources**
  - Air Management Practices Assessment Tool
  - California Dairy Quality Assurance Program
  - Carbon Credits from Livestock Production
  - Iowa Department of Natural Resources Air Quality
  - ISU Animal Agriculture and Air Quality
  - LPE Learning Center's Air Quality page
  - Manure Du Jour: Serving Pennsylvania's Best Practices on Animal Agriculture, Air and Water Quality Protection
  - Michigan State University Animal Agriculture and the Environment
  - Minnesota OFFSET (updated version)
  - Nebraska Odor Footprint Tool
  - NRCS Practice Standards
  - Practices to Reduce Odor from Livestock Operations (07/12/2004)
  - Practices to Reduce Ammonia Emissions from Livestock Operations (07/12/2004)
  - Practices to Reduce Hydrogen Sulfide from Livestock Operations (07/12/2004)
  - Practices to Reduce Dust and Particulates from Livestock Operations (07/12/2004)
  - University of California Manure Management
  - UNL Manure Management Air Quality Page
  - U.S. EPA Air
  - U.S. EPA Region 7 Air Program
- State Contacts**
- About the Tool**

# LPE Learning Center

- Air Quality in Animal Agriculture on eXtension.org
- <http://www.extension.org/pages/15538/air-quality-in-animal-agriculture#.VcE85v4w9GE>

The screenshot shows the eXtension.org website page for "Air Quality in Animal Agriculture". The page features a navigation menu, a search bar, and a main content area with various sections including "Educational Curricula", "Tools For Farmers", and "Upcoming Webinars".

**Air Quality in Animal Agriculture**  
February 04, 2015

**Educational Curricula**  
These materials are suitable for widespread use, but were developed especially to assist educators in their classrooms and educational programs. These include fact sheets suitable for handouts. Additional materials vary by topic but may include archived webinars, videos, technology summaries, photos, or presentation slides.

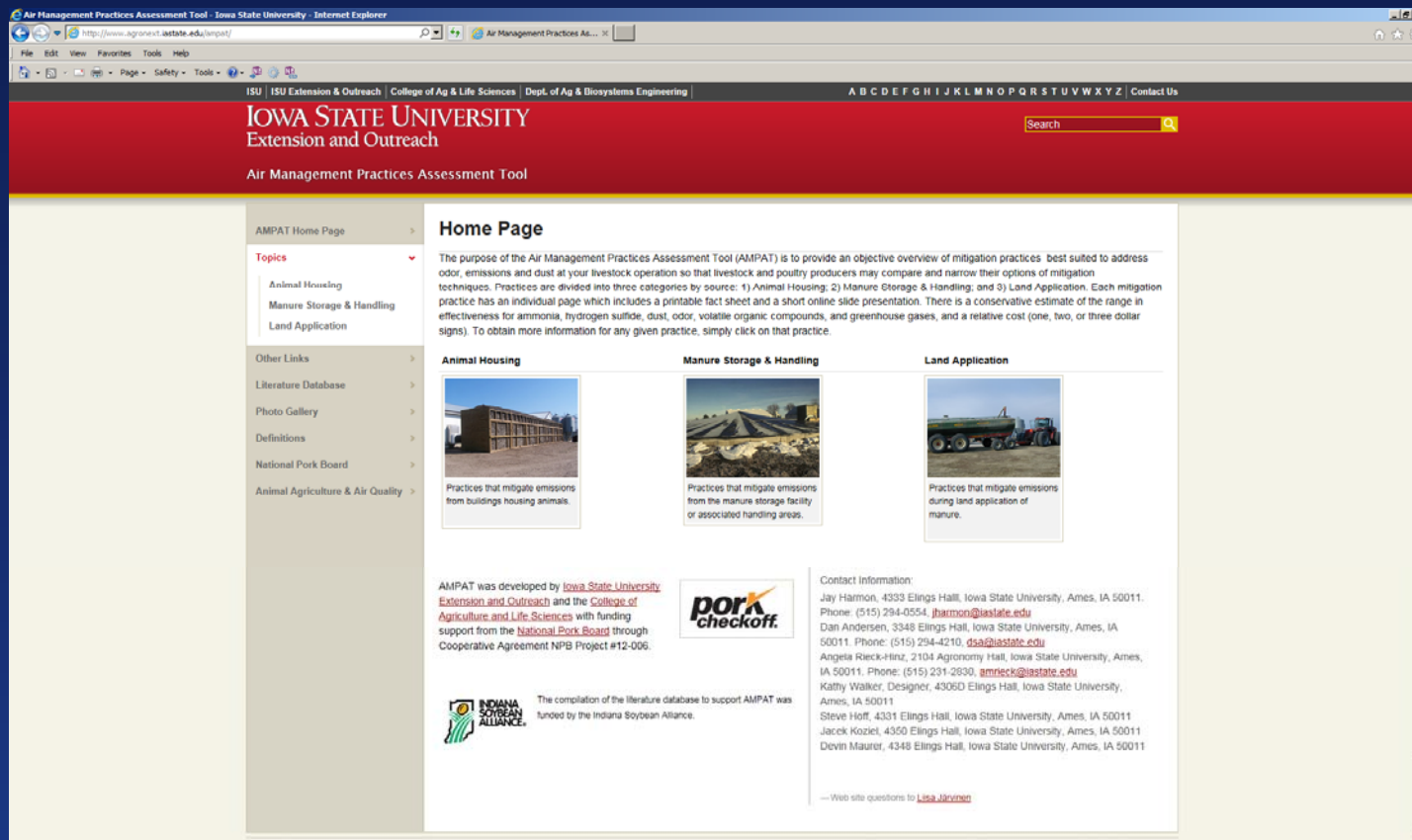
Introducing the Issues			
Atmospheric Ammonia	Dust (Particulate Matter)	Regulations	Odors
Health Impacts	Hydrogen Sulfide		
Measuring Air Emissions			
Introduction to Measurement	Hydrogen Sulfide	Particulate Matter	Odors
Bioaerosols			
Managing Air Emissions			
Ammonia	Airborne Emissions	Manure and Litter Additives	Manure Storage Covers
Biofilters	Wet Scrubbers	Dust (Particulate Matter)	Diet & Feed Management
Odors and Setbacks			

**Tools For Farmers**  
National Air Quality Site Assessment Tool (NAQSAT) - a confidential, non-quantitative way to look at different management practices and see what impacts those changes are likely to have on the gases and odors emitted from your farm. Related: NAQSAT for swine and poultry, beef and dairy.

**Upcoming Webinars**  
August 6  
Manure as a Solid Waste and Clean Air Issues in Animal Agriculture Webinar  
August 21  
Agronomic and Environmental Uses of Biochar - Part 2

# AMPAT

- Air Management Practices Assessment Tool
- <http://www.agronext.iastate.edu/ampat/>



The screenshot shows the AMPAT website in an Internet Explorer browser window. The page features a red header with the Iowa State University logo and navigation links. A search bar is located in the top right. The main content area is divided into a left sidebar with navigation options like 'AMPAT Home Page', 'Topics', and 'Other Links', and a main content area. The main content area includes a 'Home Page' section with a descriptive paragraph, three categories of mitigation practices (Animal Housing, Manure Storage & Handling, and Land Application) each with a representative image and a brief description, and a 'Contact Information' section with contact details for Jay Hammon, Dan Andersen, Angela Reck-Hinz, Kathy Walker, and Steve Hoff. There are also logos for the National Pork Board and the Indiana Soybean Alliance.

# Questions?

Greg Zwicke

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(970) 295-5621

Dr. Shawn Archibeque

shawn.archibeque@colostate.edu  
(970) 491-6649