



Today's Webinar Host  
Evelyn.M.Johnson@por.usda.gov  
Portland, OR

## USDA Natural Resources Conservation Service Science and Technology

### 2015 Conservation Webinars



Today's Webinar Presenter  
Greg.Zwicke@ftc.usda.gov  
Ft. Collins, Colorado



Today's Webinar Presenter  
Shawn.Archibeque@colostate.edu  
Ft. Collins, Colorado

Date	2015 Conservation Webinars Topics
------	-----------------------------------

Aug 11 Using the National Air Quality Site Assessment Tool for Air Quality Conservation Planning at Dairies

Aug 12 Using the National Air Quality Site Assessment Tool for Air Quality Conservation Planning at Swine Operations

Aug 13 Using the National Air Quality Site Assessment Tool for Air Quality Conservation Planning at Poultry Operations

On-demand replays are available within a couple of days of the live webinar.  
<http://conservationwebinars.net>

#### Participant Feedback, CEUs, and Certificates

Return to the webinar portal and complete Step 2 when the presentation has concluded

Rate and comment on the webinar

Take a brief post-test for CEUs/certificate

Enter your certification credentials, including your certification number, if appropriate

Receive your training certificate by email

We submit Professional Viewing CEUs the first of the month on your behalf (AFGC, ARPAS, CCA, SAF, SRM, and/or TWS), but not for Conservation Planner or other state-specific certification programs

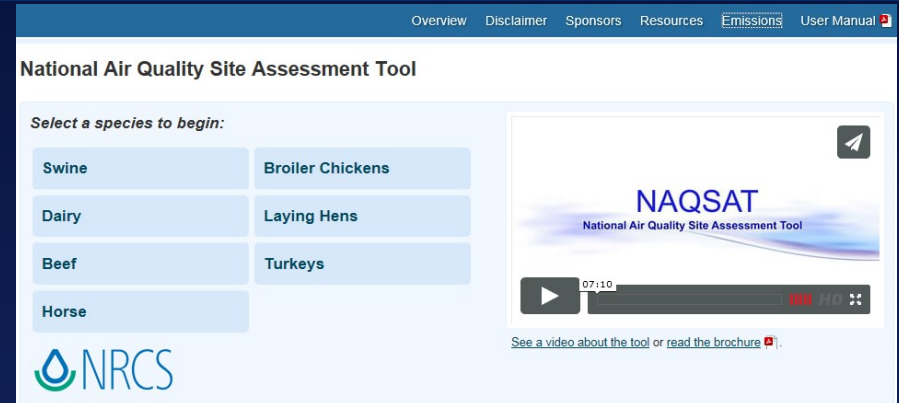


Join information for our webinars (live and on-demand) is made available at the Science and Technology Training Library at [ConservationWebinars.net](http://ConservationWebinars.net). The webinar portal at [ConservationWebinars.net](http://ConservationWebinars.net) is provided in partnership with Southern Regional Extension Forestry.



USDA is an equal opportunity employer and provider.





# NAQSAT Overview

August 11-13, 2015

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

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, age, disability, and where applicable, sex, marital status, familial status, parental status, religion, sexual orientation, genetic information, political beliefs, reprisal, or because all or a part of an individual's income is derived from any public assistance program. (Not all prohibited bases apply to all programs.) Persons with disabilities who require alternative means for communication of program information (Braille, large print, audiotape, etc.) should contact USDA's TARGET Center at (202) 720-2600 (voice and TDD). To file a complaint of discrimination write to USDA, Director, Office of Civil Rights, 1400 Independence Avenue, S.W., Washington, D.C. 20250-9410 or call (800) 795-3272 (voice) or (202) 720-6382 (TDD). USDA is an equal opportunity provider and employer.

# 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?

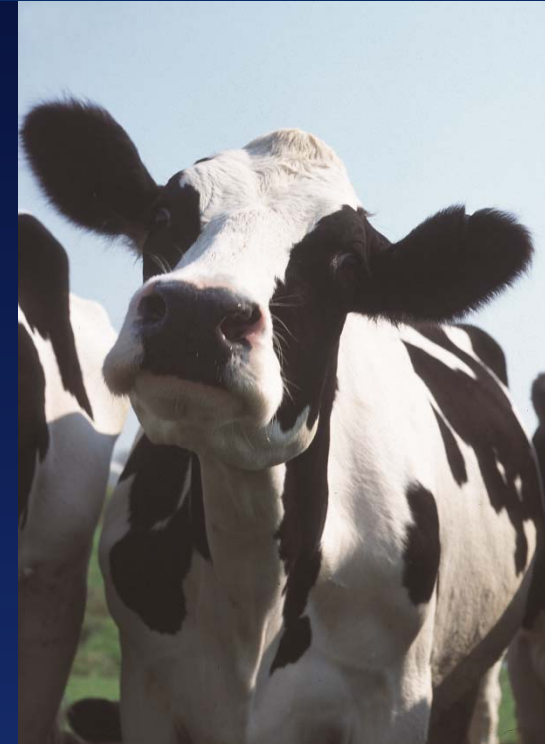
- See updated NRCS National Instructions 190-309 (July 2015)
- Required for confined livestock and poultry operations with  $\geq 300$  AU
  - Swine
  - Dairy
  - Beef
  - Horse
  - Broiler chickens
  - Laying hens
  - Turkeys

# 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 - Dairy

August 11, 2015



### Dairy National Air Quality Site Assessment Tool

**Note:** Do not use your browser's back button to navigate this form. Save often using the **Save Progress** buttons at the end of each section.

#### 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.

Housing type: Select the photo that best represents your facility for each set of photos revealed below.

- Pasture
- Freestall/Tiestall/Standion/Confinement
- Freestall/Tiestall/Standion with lot

Bedding conditions: (Click on an image below; your selection will highlight in green.)



Uneven wet bedding, manure accumulation



Some wet stalls with manure



Dry, groomed regularly



Dry, full, clean, well groomed

Percentage of floor wet or manure covered:

- Up to 25%
- 26 to 50%
- >50%

Lot condition:

- Deep wet manure, significant ponding
- Large wet areas, poorly drained
- Varied surface and wetness
- Dry throughout and well drained

At what time of day do animals have access to the lot? (Check all that apply)

- Morning
- Mid-day
- Evening

Time of day that harrowing occurs?

- Morning
- Mid-day

Bedded pack/compost barn

### Dairy National Air Quality Site Assessment Tool

Note: Do not use your browser's back button to navigate this form. Save often using the Save Progress buttons at the end of each section.

**Animals and Housing**

**Feed and Water**

Number of rations formulated for your lactating herd:

1  
 2-3  
 4 or more

How often are feed ingredients analyzed?

Weekly  
 Twice monthly  
 Monthly or less frequently  
 Never  
 I don't know

What is your roughage source? (Check all that apply)

Fermented forages  
 Unfermented forages  
 Coproduct feeds (cottonseed hulls, pulps)

Using ionophores (i.e. Rumensin)?

Yes  
 No

Formulating for crude protein or metabolizable protein?

Metabolizable protein  
 Crude protein

CP for each ration identified:

$\geq 17\%$   
  $< 17\%$

I don't know

What percent of distillers grains are fed (including dry and wet sources as a % of diet on dry basis)?

0  
 1-10%  
 10-20%  
 20-40%  
  $> 40\%$

Do you notice a sulfur odor (rotten eggs) in your water?

Yes  
 No

What is your diet fat content on a dry matter basis?

$< 5\%$   
 5-8%

Do you notice a sulfur odor (rotten eggs) in your water?

Yes  
 No

What is your diet fat content on a dry matter basis?

< 5%  
 5-8%  
 > 8%  
 I don't know

What ration inputs are processed onsite, not including crop harvest? (Check all that apply)

Roughage  
 Are you doing anything to try to control dust when processing?  
 Yes  
 No

Grain grinding/processing  
 Other products (i.e. Total Mixed Ration)

How are fermented and wet feeds (hays, grains, co-products) stored onsite? (Check all that apply)

Upright silo  
 Uncovered bunker/piles  
 Covered bunker/piles  
 Commodity barn  
 Bags/wraps  
 No fermented feeds onsite

How is water supplied to your animals in the freestall/tiestal/stanchion with lot facility?

Cups, bowls, or balls  
 Stock tank or circulating tank  
 Overflow waterers (seasonal and run continuously)

How often are all waterers checked then repaired for leaks?

Daily  
 At least weekly  
 Weekly or less frequently

Save Progress

Collection and Transfer  
 Manure Storage  
 Land Application  
 Mortalities  
 On-farm Roads  
 Perception

Get Results Save Progress Copy Session Last saved at: 8/5/2015 11:30:39 AM

Select a new species and start over

### Dairy National Air Quality Site Assessment Tool

Note: Do not use your browser's back button to navigate this form. Save often using the Save Progress buttons at the end of each section.

#### Animals and Housing

#### Feed and Water

#### 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.

Which best describes your manure handling system? (Check all that apply)

- Flush
- Scrape/vacuum

How often do you scrape or vacuum?

- Less than once daily
- Once daily
- 2 to 3 times daily
- More than 3 times daily

Which photo best represents the typical floor conditions half way between cleanings? (Click on an image below; your selection will highlight in green.)



complete manure coverage, deep manure, cows splash when walking



majority manure coverage, minimal splashing



some manure accumulation



minimal manure coverage

- Gutter
- Deep pit
- Solid Removal

Do you transfer the majority of manure from housing to storage using an open or closed channel?

- Open conduit or channel

Does ponding occur?

- Yes

- Gutter
- Deep pit
- Solid Removal

Do you transfer the majority of manure from housing to storage using an open or closed channel?

Open conduit or channel

Does ponding occur?

Yes

No

Closed conduit or pipe or channel

Does not apply

Is the majority of liquid manure typically loaded into the storage above or below the surface?

Above

Below

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

Pipe, closed channel, hose or drag hose

Open channel

Tank-type spreader or tanker

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

Is the manure spilled at the loading station/area?

Yes

Is it tracked offsite?

Yes

No

No

 Save Progress

Manure Storage

Land Application


Mortalities

On-farm Roads

Perception

 Get Results

 Save Progress

 Copy Session

Last saved at: 8/5/2015 11:30:39 AM

Select a new species and start over

### Dairy National Air Quality Site Assessment Tool

Note: Do not use your browser's back button to navigate this form. Save often using the Save Progress buttons at the end of each section.

- Animals and Housing
- Feed and Water
- Collection and Transfer
- 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 you haul manure daily?  
 Yes  
 No

Is milkhouse washwater stored separate from manure?  
 Yes  
 No

What percent of your farm's manure is stored as a liquid or slurry (does not stack) in your predominant housing type?  
Please slide to change value:  
value: 67%

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

Are you following a specific recipe?  
 Yes  
What is your recipe?  
 3:1 or greater carbon source (stalks, sawdust, straw, etc) manure  
 < 3:1 carbon source (stalks, sawdust, straw, etc) manure  
 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

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 is compost cover added?

With each manure addition

At least once daily

Less frequently than each manure addition

How often are maggots noticed?

Rarely

Commonly

How often are flies noticed?

Rarely

Commonly

- Pelletizing
- Gasification
- Incineration/burn

For each stage of manure storage you have, click the "Add Stage" button below and complete the questions for each stage. For example, if you have a 3-stage manure storage system, you will need to complete the first stage below, and then add 2 stages (click the "Add stage" button twice).

**Stage 1**

Does your manure contain greater or less than 5 lb of nitrogen per 1000 gallons (600 mg/kg) or less than 4% solids?

Less than 5 lbs/1000 gallons or 600 mg/kg and be less than 4% total solids

Greater than 5 lb N / 1000 gal and greater than 4% total solids

I don't know

Which best describes the consistency of your liquid?

Water

Motor oil

Regarding your manure storage structure, describe the material for any cover that you may have on it.

Natural crust

Permeable cover (such as straw, stalks, geotextile material)

Impermeable cover (such as plastic)

Building (for slatted or deep pit buildings)

No cover

What percent of the surface is exposed or uncovered?

< 25%

26-40%

41-60%

61-85%

> 86%

**Stage 2**

Does your manure contain greater or less than 5 lb of nitrogen per 1000 gallons (600 mg/kg) or less than 4% solids?

Less than 5 lbs/1000 gallons or 600 mg/kg and be less than 4% total solids

Greater than 5 lb N / 1000 gal and greater than 4% total solids

I don't know



### Dairy National Air Quality Site Assessment Tool

Note: Do not use your browser's back button to navigate this form. Save often using the Save Progress buttons at the end of each section.

- Animals and Housing
- Feed and Water
- Collection and Transfer
- Manure Storage
- Land Application**

Where does manure go?

- Moved offsite (sold or given away) directly from the housing
- Composted or stockpiled, then sold or given away
- Year-round pasture-based
- 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

Do you typically... (Select the predominant practice)

- inject?
- incorporate within 24 hours?
- incorporate 24 hours or greater following application?
- irrigate?

Choose your irrigation method

- Flood or furrow irrigation
- High pressure sprinkler or gun
- Low pressure sprinkler (drop drag line)
- Low pressure sprinkler (low canopy system)

Does ponding occur following irrigation?

- Yes
- No

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

Do you typically... (Select the predominant practice)

inject?

incorporate within 24 hours?

incorporate 24 hours or greater following application?

irrigate?

Choose your irrigation method

Flood or furrow irrigation

High pressure sprinkler or gun

Low pressure sprinkler (drop drag line)

Low pressure sprinkler (low canopy system)

Does ponding occur following irrigation?

Yes


No

Is freshwater added?

Yes

No

Surface applied and not incorporated

 Save Progress

▾ Mortalities

▾ On-farm Roads

▾ Perception

 Get Results  Save Progress  Copy Session

Select a new species and start over

Dairy | National Air Quality ... x

naqsat.tamu.edu/dairy/

Search

- Feed and Water
- Collection and Transfer
- Manure Storage
- Land Application
- Mortalities**

Other than during freezing weather, how long before carcasses are picked up or put into the disposal system?

Within 24 hours of death

Within a week of death

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 or greater carbon source (stalks, sawdust, straw, etc):mortality

< 3:1 carbon source (stalks, sawdust, straw, etc):mortality

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 noticed?

Rarely

Commonly

How often are 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

### Dairy | National Air Quality Site Assessment Tool

**Note:** Do not use your browser's back button to navigate this form. Save often using the Save Progress buttons at the end of each section.

- Animals and Housing
- Feed and Water
- Collection and Transfer
- Manure Storage
- Land Application
- Mortalities
- 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

Dairy National Air Quality Site Assessment Tool

Note: Do not use your browser's back button to navigate this form. Save often using the Save Progress buttons at the end of each section.

- Animals and Housing
- Feed and Water
- Collection and Transfer
- Manure Storage
- Land Application
- Mortalities
- On-farm Roads
- 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

This is the last section of questions. Use the Get Results button below to see your score.

## 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
Feed and Water							N/A
Collection and Transfer							N/A
Manure Storage							
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



**Print My Report**

View a print version of your results, questions, and answers.



**Take a survey**

Did you find this tool useful? Help us improve by taking a short survey.


 **Select a new species and start over**

(Note your save URL on the right or you will lose this session)

### Saved Session Information:

If you wish to retrieve your session at a later time, copy the following URL:

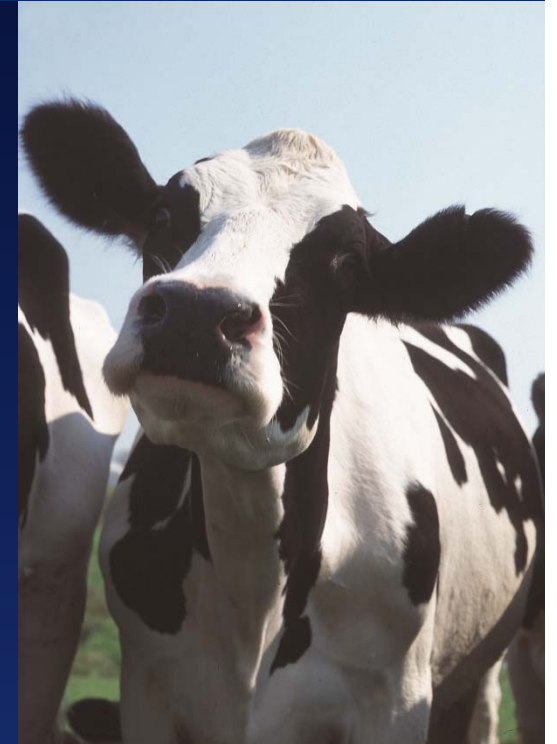
<http://naqsat.tamu.edu/dairy/?key=65331d43>

 Create a bookmark to this page in your browser

Your session will be kept in our system until 9/10/2015.

# Using NAQSAT Results

August 11, 2015



# Where Do We Start?

## 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
Feed and Water							N/A
Collection and Transfer							N/A
Manure Storage							
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

**Print My Report**

View a print version of your results, questions, and answers.

**Take a survey**

Did you find this tool useful? Help us improve by taking a short survey.

**Select a new species and start over**  
(Note your save URL on the right or you will lose this session)

### Saved Session Information:

If you wish to retrieve your session at a later time, copy the following URL:

<http://naqsat.tamu.edu/dairy/?key=65331d43>

Create a bookmark to this page in your browser

Your session will be kept in our system until 9/10/2015.

# 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)
Animals and Housing							N/A
Feed and Water							N/A
Collection and Transfer							N/A
Manure Storage							
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

**Print My Report** View a print version of your results, questions, and answers.

**Take a survey** Did you find this tool useful? Help us improve by taking a short survey.

**Select a new species and start over**  
(Note your save URL on the right or you will lose this session)

**Saved Session Information:**  
If you wish to retrieve your session at a later time, copy the following URL:

<http://naqsat.tamu.edu/dairy/?key=65331d43>

Create a bookmark to this page in your browser  
Your session will be kept in our system until 9/10/2015.

# 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

## 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
Feed and Water							N/A
Collection and Transfer							N/A
Manure Storage							
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

**Print My Report**

View a print version of your results, questions, and answers.

**Take a survey**

Did you find this tool useful? Help us improve by taking a short survey.

**Select a new species and start over**

(Note your save URL on the right or you will lose this session)

### Saved Session Information:

If you wish to retrieve your session at a later time, copy the following URL:

<http://naqsat.tamu.edu/dairy/?key=65331d43>

Create a bookmark to this page in your browser

Your session will be kept in our system until 9/10/2015.

# Ozone Precursors Resource Concern

- Focus on score bar for:
  - Volatile organic compounds

**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	<div style="width: 20%; background-color: green;"></div>	<div style="width: 20%; background-color: green;"></div>	<div style="width: 20%; background-color: green;"></div>	<div style="width: 20%; background-color: green;"></div>	<div style="width: 20%; background-color: green;"></div>	<div style="width: 20%; background-color: green;"></div>	N/A
Feed and Water	<div style="width: 20%; background-color: green;"></div>	<div style="width: 20%; background-color: green;"></div>	<div style="width: 20%; background-color: green;"></div>	<div style="width: 20%; background-color: green;"></div>	<div style="width: 20%; background-color: green;"></div>	<div style="width: 20%; background-color: green;"></div>	N/A
Collection and Transfer	<div style="width: 20%; background-color: green;"></div>	<div style="width: 20%; background-color: green;"></div>	<div style="width: 20%; background-color: green;"></div>	<div style="width: 20%; background-color: green;"></div>	<div style="width: 20%; background-color: green;"></div>	<div style="width: 20%; background-color: green;"></div>	N/A
Manure Storage	<div style="width: 20%; background-color: green;"></div>	<div style="width: 20%; background-color: green;"></div>	<div style="width: 20%; background-color: green;"></div>	<div style="width: 20%; background-color: green;"></div>	<div style="width: 20%; background-color: green;"></div>	<div style="width: 20%; background-color: green;"></div>	<div style="width: 20%; background-color: green;"></div>
Land Application	<div style="width: 20%; background-color: green;"></div>	<div style="width: 20%; background-color: green;"></div>	<div style="width: 20%; background-color: green;"></div>	<div style="width: 20%; background-color: green;"></div>	<div style="width: 20%; background-color: green;"></div>	<div style="width: 20%; background-color: green;"></div>	N/A
Mortalities	<div style="width: 20%; background-color: green;"></div>	N/A	<div style="width: 20%; background-color: green;"></div>	<div style="width: 20%; background-color: green;"></div>	<div style="width: 20%; background-color: green;"></div>	<div style="width: 20%; background-color: green;"></div>	N/A
On-farm Roads	<div style="width: 20%; background-color: green;"></div>	<div style="width: 20%; background-color: green;"></div>	<div style="width: 20%; background-color: green;"></div>	N/A	N/A	<div style="width: 20%; background-color: green;"></div>	N/A
Perception	<div style="width: 20%; background-color: green;"></div>	<div style="width: 20%; background-color: green;"></div>	N/A	N/A	N/A	N/A	N/A

**Print My Report** View a print version of your results, questions, and answers.

**Take a survey** Did you find this tool useful? Help us improve by taking a short survey.

**Select a new species and start over**  
(Note your save URL on the right or you will lose this session)

**Saved Session Information:**  
If you wish to retrieve your session at a later time, copy the following URL:

<http://naqsat.tamu.edu/dairy/?key=65331d43>

Create a bookmark to this page in your browser  
Your session will be kept in our system until 9/10/2015.

# 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) ✕

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
Feed and Water							N/A
Collection and Transfer							N/A
Manure Storage							
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

**Print My Report**

View a print version of your results, questions, and answers.

**Take a survey**

Did you find this tool useful? Help us improve by taking a short survey.

**Select a new species and start over**

(Note your save URL on the right or you will lose this session)

### Saved Session Information:

If you wish to retrieve your session at a later time, copy the following URL:

<http://naqsat.tamu.edu/dairy/?key=65331d43>

Create a bookmark to this page in your browser

Your session will be kept in our system until 9/10/2015.

# Odors Resource Concern

- Focus on score bars for:
  - Odor
  - Volatile organic compounds
  - Hydrogen sulfide
  - 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 practical 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
Feed and Water							N/A
Collection and Transfer							N/A
Manure Storage							
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

**Print My Report** View a print version of your results, questions, and answers.

**Take a survey** Did you find this tool useful? Help us improve by taking a short survey.

**Select a new species and start over**  
(Note your save URL on the right or you will lose this session)

**Saved Session Information:**  
If you wish to retrieve your session at a later time, copy the following URL:

<http://naqsat.tamu.edu/dairy/?key=65331d43>

Create a bookmark to this page in your browser

Your session will be kept in our system until 9/10/2015.

# 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
Feed and Water							N/A
Collection and Transfer							N/A
Manure Storage							
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

**Print My Report** *View a print version of your results, questions, and answers.*

**Take a survey** *Did you find this tool useful? Help us improve by taking a short survey.*

**Select a new species and start over**  
(Note your save URL on the right or you will lose this session)

### Saved Session Information:

If you wish to retrieve your session at a later time, copy the following URL:

<http://naqsat.tamu.edu/dairy/?key=65331d43>

Create a bookmark to this page in your browser

Your session will be kept in our system until 9/10/2015.

# GHG Resource Concern

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

**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
Feed and Water							N/A
Collection and Transfer							N/A
Manure Storage							
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

**Print My Report** View a print version of your results, questions, and answers.

**Take a survey** Did you find this tool useful? Help us improve by taking a short survey.

**Select a new species and start over**  
(Note your save URL on the right or you will lose this session)

**Saved Session Information:**  
If you wish to retrieve your session at a later time, copy the following URL:

`http://naqsat.tamu.edu/dairy/?key=65331d43`

Create a bookmark to this page in your browser  
Your session will be kept in our system until 9/10/2015.

# 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

## 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
Feed and Water							N/A
Collection and Transfer							N/A
Manure Storage							
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

**Print My Report** *View a print version of your results, questions, and answers.*

**Take a survey** *Did you find this tool useful? Help us improve by taking a short survey.*

**Select a new species and start over**  
(Note your save URL on the right or you will lose this session)

**Saved Session Information:**  
If you wish to retrieve your session at a later time, copy the following URL:

<http://naqsat.tamu.edu/dairy/?key=65331d43>

Create a bookmark to this page in your browser  
Your session will be kept in our system until 9/10/2015.

# Example

- Western dairy
- No nonattainment issues
- Received some odor complaints

# 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
Feed and Water							N/A
Collection and Transfer							N/A
Manure Storage							
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

**Print My Report** *View a print version of your results, questions, and answers.*

**Take a survey** *Did you find this tool useful? Help us improve by taking a short survey.*

**Select a new species and start over**  
(Note your save URL on the right or you will lose this session)

### Saved Session Information:

If you wish to retrieve your session at a later time, copy the following URL:

<http://naqsat.tamu.edu/dairy/?key=65331d43>

Create a bookmark to this page in your browser

Your session will be kept in our system until 9/10/2015.

# 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
Feed and Water							N/A
Collection and Transfer							N/A
Manure Storage							
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



**Print My Report**

View a print version of your results, questions, and answers.



**Take a survey**

Did you find this tool useful? Help us improve by taking a short survey.

**Select a new species and start over**

(Note your save URL on the right or you will lose this session)

### Saved Session Information:

If you wish to retrieve your session at a later time, copy the following URL:

<http://naqsat.tamu.edu/dairy/?key=65331d43>

Create a bookmark to this page in your browser

Your session will be kept in our system until 9/10/2015.

# Feed and Water

Dairy | National Air Quality ...

naqsat.tamu.edu/dairy/

Overview | Disclaimer | Sponsors | Resources | Emissions | User Manual

### Dairy National Air Quality Site Assessment Tool

Note: Do not use your browser's back button to navigate this form. Save often using the Save Progress buttons at the end of each section.

**Animals and Housing**

**Feed and Water**

Number of rations formulated for your lactating herd:

1  
 2-3  
 4 or more

How often are feed ingredients analyzed?

Weekly  
 Twice monthly  
 Monthly or less frequently  
 Never  
 I don't know

What is your roughage source? (Check all that apply)

Fermented forages  
 Unfermented forages  
 Coproduct feeds (cottonseed hulls, pulps)

Using ionophores (i.e. Rumensin)?

Yes  
 No

Formulating for crude protein or metabolizable protein?

Metabolizable protein  
 Crude protein

CP for each ration identified:

$\geq 17\%$   
  $< 17\%$

I don't know

What percent of distillers grains are fed (including dry and wet sources as a % of diet on dry basis)?

0  
 1-10%  
 10-20%  
 20-40%  
  $> 40\%$

Do you notice a sulfur odor (rotten eggs) in your water?

Yes  
 No

What is your diet fat content on a dry matter basis?

$< 5\%$   
 5-8%

# Feed and Water

Dairy | National Air Quality ... x +

naqsat.tamu.edu/dairy/

Search

Do you notice a sulfur odor (rotten eggs) in your water?

Yes  
 No

What is your diet fat content on a dry matter basis?

< 5%  
 5-8%  
 > 8%  
 I don't know

What ration inputs are processed onsite, not including crop harvest? (Check all that apply)

Roughage

Are you doing anything to try to control dust when processing?

Yes  
 No

Grain grinding/processing  
 Other products (i.e. Total Mixed Ration)

How are fermented and wet feeds (hays, grains, co-products) stored onsite? (Check all that apply)

Upright silo  
 Uncovered bunker/piles  
 Covered bunker/piles  
 Commodity barn  
 Bags/wraps  
 No fermented feeds onsite

How is water supplied to your animals in the freestall/tiestall/stanchion with lot facility?

Cups, bowls, or bells  
 Stock tank or circulating tank  
 Overflow waterers (seasonal and run continuously)

How often are all waterers checked then repaired for leaks?

Daily  
 At least weekly  
 Weekly or less frequently

Save Progress

Collection and Transfer

Manure Storage

Land Application

Mortalities

On-farm Roads

Perception

Get Results Save Progress Copy Session

Last saved at: 8/3/2015 11:30:39 AM

Select a new species and start over

# Feed and Water

Dairy | National Air Quality ... x +

naqsat.tamu.edu/dairy/

Do you notice a sulfur odor (rotten eggs) in your water?

Yes  
 No

What is your diet fat content on a dry matter basis?

< 5%  
 5-8%  
 > 8%  
 I don't know

What ration inputs are processed onsite, not including crop harvest? (Check all that apply)

Roughage  
Are you doing anything to try to control dust when processing?  
 Yes  
 No

Grain grinding/processing  
 Other products (i.e. Total Mixed Ration)

How are fermented and wet feeds (hays, grains, co-products) stored onsite? (Check all that apply)

Upright silo  
 Uncovered bunker/piles  
 Covered bunker/piles  
 Commodity barn  
 Bags/wraps  
 Fermented feeds onsite

How is water supplied to your animals in the freestall/tiestal/stanchion with lot facility?

Cups, bowls, or bells  
 Stock tank or circulating tank  
 Overflow waterers (seasonal and run continuously)

How often are all waterers checked then repaired for leaks?

Daily  
 At least weekly  
 Weekly or less frequently

Save Progress

Collection and Transfer  
Manure Storage  
Land Application  
Mortalities  
On-farm Roads  
Perception

Get Results Save Progress Copy Session Last saved at: 8/3/2015 11:30:39 AM

Select a new species and start over

# Feed and Water

Dairy | National Air Quality ... x +

naqsat.tamu.edu/dairy/

Do you notice a sulfur odor (rotten eggs) in your water?

Yes  
 No

What is your diet fat content on a dry matter basis?

< 5%  
 5-8%  
 > 8%  
 I don't know

What ration inputs are processed onsite, not including crop harvest? (Check all that apply)

Roughage

Are you doing anything to try to control dust when processing?

Yes  
 No

Grain grinding/processing  
 Other products (i.e. Total Mixed Ration)

How are fermented and wet feeds (hays, grains, co-products) stored onsite? (Check all that apply)


Upright silo  
 Uncovered bunker/piles  
 Covered bunker/piles  
 Commodity barn  
 Bags/wraps  
 No fermented feeds onsite

How is water supplied to your animals in the freestall/tiestall/stanchion with lot facility?



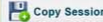
Cups, bowls, or balls  
 Stock tank or circulating tank  
 Overflow waterers (seasonal and run continuously)

How often are all waterers checked then repaired for leaks?

Daily  
 At least weekly  
 Weekly or less frequently



Collection and Transfer  
Manure Storage  
Land Application  
Mortalities  
On-farm Roads  
Perception

   Last saved at: 8/3/2015 11:30:39 AM

Select a new species and start over

# 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
Feed and Water							N/A
Collection and Transfer							N/A
Manure Storage							
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

**Print My Report** *View a print version of your results, questions, and answers.*

**Saved Session Information:**  
If you wish to retrieve your session at a later time, copy the following URL:

**Take a survey** *Did you find this tool useful? Help us improve by taking a short survey.*

<http://naqsat.tamu.edu/dairy/?key=65331d43>

**Select a new species and start over**  
*(Note your save URL on the right or you will lose this session)*

*Create a bookmark to this page in your browser*  
Your session will be kept in our system until 9/10/2015.

# Manure Storage

Dairy | National Air Quality Site Assessment Tool

Note: Do not use your browser's back button to navigate this form. Save often using the Save Progress buttons at the end of each section.

- Animals and Housing
- Feed and Water
- Collection and Transfer
- 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 you haul manure daily?

Yes  
 No

Is milkhouse washwater stored separate from manure?

Yes  
 No

What percent of your farm's manure is stored as a liquid or slurry (does not stack) in your predominant housing type?

Please slide to change value:  67%

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

Are you following a specific recipe?

Yes  
What is your recipe?  
 3:1 or greater carbon source (stalks, sawdust, straw, etc):manure  
 < 3:1 carbon source (stalks, sawdust, straw, etc):manure

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

# Manure Storage

Dairy | National Air Quality ... x

naqsat.tamu.edu/dairy/

Search

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 is compost cover added?

- With each manure addition
- At least once daily
- Less frequently than each manure addition

How often are maggots noticed?

- Rarely
- Commonly

How often are flies noticed?

- Rarely
- Commonly

Pelletizing

Gasification

Incineration/burn

For each stage of manure storage you have, click the "Add Stage" button below and complete the questions for each stage. For example, if you have a 3-stage manure storage system, you will need to complete the first stage below, and then add 2 stages (click the "Add stage" button twice).

**Stage 1**

Does your manure contain greater or less than 5 lb of nitrogen per 1000 gallons (600 mg/kg) or less than 4% solids?

- Less than 5 lbs/1000 gallons or 600 mg/kg and be less than 4% total solids
- Greater than 5 lb N / 1000 gal and greater than 4% total solids
- I don't know

Which best describes the consistency of your liquid?

- Water
- Motor oil

Regarding your manure storage structure, describe the material for any cover that you may have on it.

- Natural crust
- Permeable cover (such as straw, stalks, geotextile material)
- Impermeable cover (such as plastic)
- Building (for slatted or deep pit buildings)
- No cover

What percent of the surface is exposed or uncovered?

- < 25%
- 26-40%
- 41-60%
- 61-85%
- > 85%

**Stage 2**

Does your manure contain greater or less than 5 lb of nitrogen per 1000 gallons (600 mg/kg) or less than 4% solids?

- Less than 5 lbs/1000 gallons or 600 mg/kg and be less than 4% total solids
- Greater than 5 lb N / 1000 gal and greater than 4% total solids
- I don't know

# Manure Storage

Dairy | National Air Quality ...

naqsat.tamu.edu/dairy/

25-40%  
41-60%  
61-85%  
> 85%

**Stage 2**

Does your manure contain greater or less than 5 lb of nitrogen per 1000 gallons (600 mg/kg) or less than 4% solids?

Less than 5 lbs/1000 gallons or 600 mg/kg and be less than 4% total solids  
 Greater than 5 lb N / 1000 gal and greater than 4% total solids  
 I don't know

Which best describes the consistency of your liquid?

Water

Is your solids content less than 1%?

Yes  
 No

Do you aerate?

Yes  
 No

Pick the color that best describes your storage:

Black or brown

Regarding your manure storage structure, describe the material for any cover that you may have on it.

Natural crust  
 Permeable cover (such as straw, stalks, geotextile material)  
 Impermeable cover (such as plastic)  
 No cover

What percent of the surface is exposed or uncovered?

< 25%  
 26-40%  
 41-60%  
 61-85%  
 > 85%

Red/maroon to purple  
 Motor oil

Add Stage

Save Progress

Land Application

Mortalities

On-farm Roads

Perception

Get Results Save Progress Copy Session

Last saved at: 8/5/2015 11:30:39 AM

Select a new species and start over

# Manure Storage

Dairy | National Air Quality ... x

naqsat.tamu.edu/dairy/

Search

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 is compost cover added?

- With each manure addition
- At least once daily
- Less frequently than each manure addition

How often are maggots noticed?

- Rarely
- Commonly

How often are flies noticed?

- Rarely
- Commonly

Pelletizing  
 Gasification  
 Incineration/burn

For each stage of manure storage you have, click the "Add Stage" button below and complete the questions for each stage. For example, if you have a 3-stage manure storage system, you will need to complete the first stage below, and then add 2 stages (click the "Add stage" button twice).

**Stage 1**

Does your manure contain greater or less than 5 lb of nitrogen per 1000 gallons (600 mg/kg) or less than 4% solids?

- Less than 5 lbs/1000 gallons or 600 mg/kg and be less than 4% total solids
- Greater than 5 lb N / 1000 gal and greater than 4% total solids
- I don't know

Which best describes the consistency of your liquid?

- Water
- Muddy

Regarding your manure storage structure, describe the material for any cover that you may have on it.

- Natural crust
- Permeable cover (such as straw, stalks, geotextile material)
- Impermeable cover (such as plastic)
- Building (for slatted or deep pit buildings)
- No cover

What percent of the surface is exposed or uncovered?

- < 25%
- 26-40%
- 41-60%
- 61-85%
- > 85%

**Stage 2**

Does your manure contain greater or less than 5 lb of nitrogen per 1000 gallons (600 mg/kg) or less than 4% solids?

- Less than 5 lbs/1000 gallons or 600 mg/kg and be less than 4% total solids
- Greater than 5 lb N / 1000 gal and greater than 4% total solids
- I don't know

# Manure Storage

Dairy | National Air Quality ... x

naqsat.tamu.edu/dairy/

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 is compost cover added?

- With each manure addition
- At least once daily
- Less frequently than each manure addition

How often are maggots noticed?

- Rarely
- Commonly

How often are flies noticed?

- Rarely
- Commonly

Pelletizing

Gasification

Incineration/burn

For each stage of manure storage you have, click the "Add Stage" button below and complete the questions for each stage. For example, if you have a 3-stage manure storage system, you will need to complete the first stage below, and then add 2 stages (click the "Add stage" button twice).

**Stage 1**

Does your manure contain greater or less than 5 lb of nitrogen per 1000 gallons (600 mg/kg) or less than 4% solids?

- Less than 5 lbs/1000 gallons or 600 mg/kg and be less than 4% total solids
- Greater than 5 lb N / 1000 gal and greater than 4% total solids
- I don't know

Which best describes the consistency of your liquid?

- Water
- Motor oil

Regarding your manure storage structure, describe the material for any cover that you may have on it.

- Natural crust
- Permeable cover (such as straw, stalks, geotextile material)
- Impermeable cover (such as plastic)
- Building (for slatted or deep pit buildings)
- No cover

What percent of the surface is exposed or uncovered?

- < 25%
- 26-40%
- 41-60%
- 61-85%
- > 85%

**Stage 2**

Does your manure contain greater or less than 5 lb of nitrogen per 1000 gallons (600 mg/kg) or less than 4% solids?

- Less than 5 lbs/1000 gallons or 600 mg/kg and be less than 4% total solids
- Greater than 5 lb N / 1000 gal and greater than 4% total solids
- I don't know

# 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
Feed and Water							N/A
Collection and Transfer							N/A
Manure Storage							
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

**Print My Report**

View a print version of your results, questions, and answers.

**Take a survey**

Did you find this tool useful? Help us improve by taking a short survey.

**Select a new species and start over**

(Note your save URL on the right or you will lose this session)

### Saved Session Information:

If you wish to retrieve your session at a later time, copy the following URL:

<http://naqsat.tamu.edu/dairy/?key=65331d43>

Create a bookmark to this page in your browser

Your session will be kept in our system until 9/10/2015.

# Possible Solution

- Feed and Water
  - Change waterers
- Manure Storage
  - Cover Stage 1 storage with permeable cover

# 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 browser interface includes a menu bar (File, Edit, View, Favorites, Tools, Help) and a toolbar with various icons. The main content area is titled "Additional Resources" and contains a list of links:

- 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

Below the list, there are two expandable sections: "State Contacts" and "About the Tool".

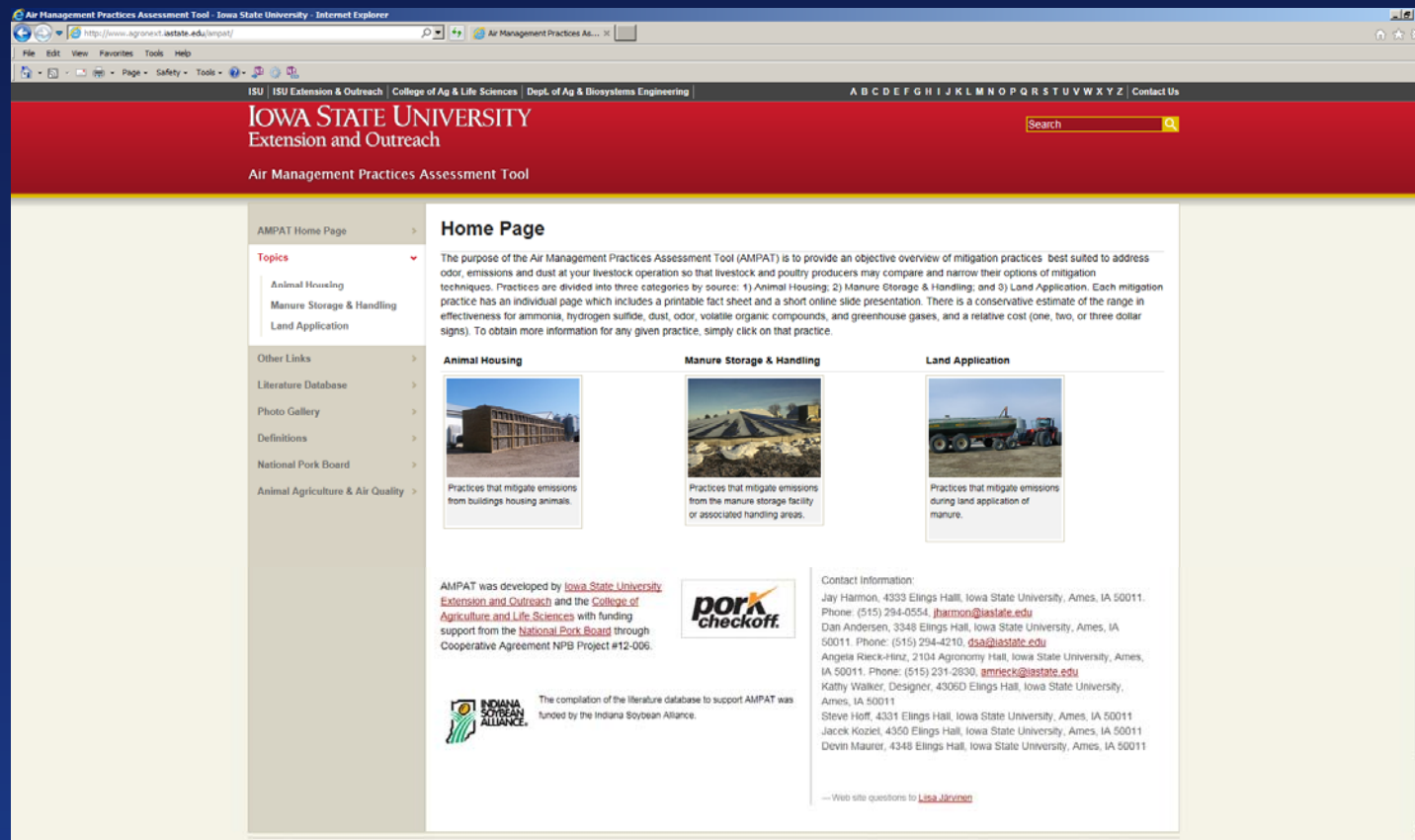
# LPE Learning Center

- 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 is dated February 04, 2015. It features a navigation menu with "Home", "Resource Areas", "About", "Support Us", and "Recent". A search bar is located in the top right corner. The main content area is titled "Air Quality in Animal Agriculture" and includes a "Print" button and social media sharing options for Facebook, Twitter, and YouTube. Below the title, there are links to "Educational Curricula", "Tools for Farmers", "Regulations", "Archived Webinars & Videos", "Self-Learning Lessons", "Mono-slope Barns (New)", and "Research Summaries". A section titled "Educational Curricula" provides a description of the materials and lists three categories of resources: "Introducing the Issues", "Measuring Air Emissions", and "Managing Air Emissions". Each category contains a table of links to specific resources. The "Introducing the Issues" table includes links for Atmospheric Ammonia, Dust (Particulate Matter), Regulations, Odors, and Health Impacts. The "Measuring Air Emissions" table includes links for Introduction to Measurement, Hydrogen Sulfide, Particulate Matter, and Odors. The "Managing Air Emissions" table includes links for Ammonia, Airborne Emissions, Manure and Litter Additives, Manure Storage Covers, Biofilters, Wet Scrubbers, Dust (Particulate Matter), and Diet & Feed Management. Below the tables, there is a section for "Tools For Farmers" featuring the National Air Quality Site Assessment Tool (NAQSAT). On the right side of the page, there is a "Connect with us" section with social media icons, a "Your Local Extension:" section with logos for Texas A&M Agrilife Extension and Prairie View A&M University, and an "Upcoming Webinars" section listing two webinars: "Manure as a Solid Waste and Clean Air Issues in Animal Agriculture Webinar" on August 6 and "Agronomic and Environmental Uses of Biochar - Part 2" on August 21.

# AMPAT

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



# Questions?

Greg Zwicke

greg.zwicke@ftc.usda.gov  
(970) 295-5621

Dr. Shawn Archibeque

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