Evaluating NRCS Air Quality and Atmospheric Change Resource Concerns

January 25, 2022

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NRCS National Air Quality & Atmospheric Change Team

Today's Webinar
2:00 pm ET

Evaluating NRCS Air Quality and Atmospheric Change Resource Concerns

Presenters:
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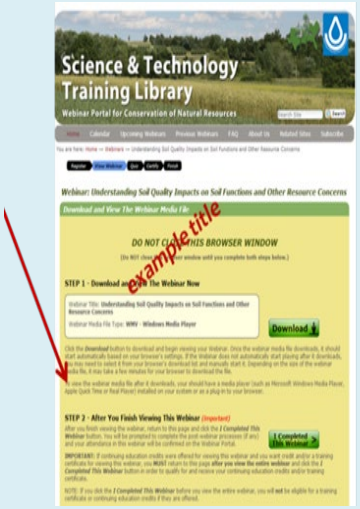
Continuing Education Units



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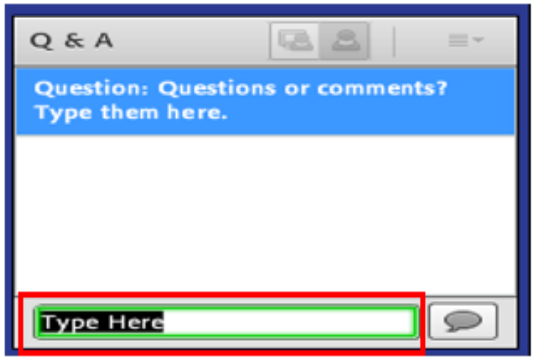
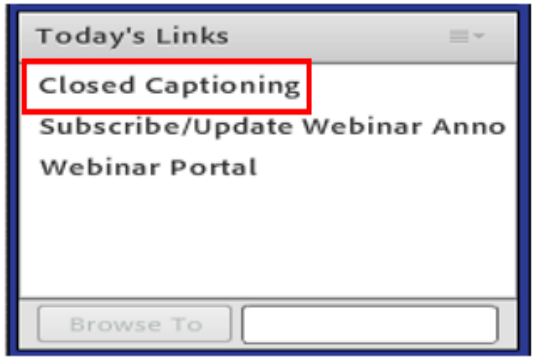


Today's Links



Today's Handouts

Evaluating NRCS Air Quality and Atmospheric Change Resource Concerns

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Outline

- Overview of AQAC in conservation planning
- Overview of AQAC resource concerns and components
  - What are they?
  - Why are we worried about them?
  - Where do they come from?
- Steps for evaluating each component
- Practices for addressing each component
- Additional resources

AQAC in Conservation Planning

- Aligned CART procedures with National Planning Procedures Handbook for AQAC (for the most part)
  - CART doesn't like use of outside tools, so a few other options in NPPH

AQAC Resource Concerns

- Emissions of Particulate Matter (PM) and PM Precursors
- Emissions of Ozone Precursors
- Emissions of Greenhouse Gases (GHGs)
- Emissions of Airborne Reactive Nitrogen (ARN)
- Objectionable Odors

PM and PM Precursors

- Small particles in the air and other gases that create those particles
- Can cause:
  - Health issues
  - Visibility degradation
  - Deposition

PM and PM Precursors

- Directly-emitted PM
  - Dust
  - Smoke
  - Combustion
  - Chemical drift
- PM Precursors
  - Form PM via chemical reactions or condensation
    - Ammonia
    - Nitrates
    - Sulfates
    - Volatile organic compounds (VOCs)

PM Resource Concern Components

- Diesel engines
- Non-diesel engine combustion equipment
- Open burning
- Pesticide drift
- Nitrogen fertilizer
- Dust from field operations
- Dust from unpaved roads
- Windblown dust
- Confined animal activities

Ozone Precursors

- Gases that create ozone via chemical reaction
  - Oxides of nitrogen (NOx)
  - Volatile organic compounds (VOCs)
- Can cause:
  - Health issues
  - Visibility degradation

Ozone Resource Concern Components

- Diesel engines
- Non-diesel engine combustion equipment
- Open burning
- Pesticide VOCs
- Confined animal activities

Greenhouse Gases

- Gases that contribute to climate change
  - Methane (CH_4)
  - Nitrous oxide (N_2O)
  - Carbon dioxide (CO_2)

GHG Resource Concern Components

- Nitrogen fertilizer
- Carbon stock
- Confined animal activities

Airborne Reactive Nitrogen

- Focused on:
  - Ammonia
  - Oxides of nitrogen (NOx)
- Can cause:
  - Atmospheric chemical reactions
  - Visibility degradation
  - Deposition

ARN Resource Concern Components

- Diesel engines
- Non-diesel engine combustion equipment
- Open burning
- Nitrogen fertilizer
- Confined animal activities

Odors

- Gases that create an objectionable smell
  - Volatile organic compounds (VOCs)
  - Ammonia
  - Odorous sulfur compounds
- Cause nuisance issues

Odor Resource Concern Components

- Nitrogen fertilizer
- Confined animal activities

Agricultural Sources

- Diesel engines
- Non-diesel engine combustion equipment
- Open burning
- Nitrogen fertilizer
- Dust from field operations
- Dust from unpaved roads
- Windblown dust
- Pesticides – drift and volatilization
- Carbon stock
- Confined animal activities

Diesel Engines

- Evaluation:
  - All diesel engines larger than 25 brake horsepower are certified to at least EPA Tier 3 standards

Diesel Engines

- What to do:
  - Apply Conservation Practice Standard (CPS) 372 – Combustion System Improvement to replace diesel engines, if necessary

Non-Diesel Engine Combustion Equipment

- Evaluation:
  - At least 50% of the normal annual fuel usage for non-diesel engine combustion sources is either natural gas or propane

  OR

  - At least 50% of the non-diesel engine combustion sources utilize emissions controls for PM and NOx

Non-Diesel Engine Combustion Equipment

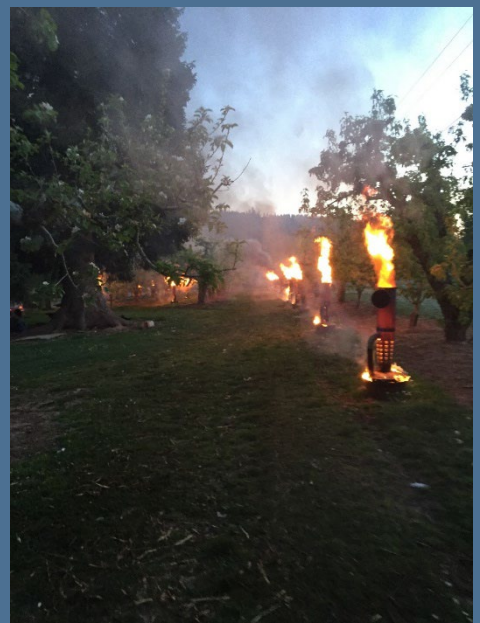
- Evaluation (for PM and Ozone nonattainment areas):
  - At least 75% of the normal annual fuel usage for non-diesel engine combustion sources is either natural gas or propane

  OR

  - At least 75% of the non-diesel engine combustion sources utilize emissions controls for PM and NOx

Non-Diesel Engine Combustion Equipment

- What to do:
  - Apply CPS 372 – Combustion System Improvement to replace, retrofit, or repower combustion equipment, if necessary



Open Burning

- Evaluation:
  - If fire is used, Basic Smoke Management Practices are implemented

Open Burning

- What to do:
  - Apply CPS 338 – Prescribed Burning to develop, implement, and follow a prescribed burn plan that includes Basic Smoke Management Practices for all fire events

  OR

  - Implement alternatives to burning by applying one or more of the following practices, as necessary:
    - CPS 376 – Field Operations Emissions Reduction
    - CPS 384 – Woody Residue Treatment
    - CPS 500 – Obstruction Removal
    - CPS 633 – Waste Recycling

Nitrogen Fertilizer

- Evaluation:
  - If nitrogen fertilizer is applied, apply according to a NRCS-approved nutrient management plan that specifically addresses nitrogen

Nitrogen Fertilizer

- What to do:
  - Apply CPS 590 – Nutrient Management to develop, implement, and follow a nutrient management plan that specifically addresses nitrogen when applying fertilizers containing nitrogen

Dust from Field Operations

- Evaluation:
  - Has the client or planner observed any PM/dust issues related to field operations, and have any practices or techniques been previously applied to address the observed PM/dust issues?

Dust from Field Operations

- What to do:
  - Apply one or more of the following practices, as necessary, to address the field operation dust issue:
    - CPS 329 – Residue and Tillage Management, No Till
    - CPS 345 – Residue and Tillage Management, Reduced Till
    - CPS 376 – Field Operations Emissions Reduction
    - CPS 380 – Windbreak/Shelterbelt Establishment and Renovation
    - CPS 422 – Hedgerow Planting

Dust from Unpaved Roads

- Evaluation:
  - Has the client or planner observed any PM/dust issues related to vehicle travel on unpaved roads and surfaces, and have any practices or techniques been previously applied to address the observed PM/dust issues?

Dust from Unpaved Roads

- What to do:
  - Apply one or more of the following practices, as necessary, to address the unpaved road dust issue:
    - CPS 373 – Dust Control on Unpaved Roads and Surfaces
    - CPS 380 – Windbreak/Shelterbelt Establishment and Renovation
    - CPS 422 – Hedgerow Planting
    - CPS 472 – Access Control
    - CPS 560 – Access Road
    - CPS 561 – Heavy Use Area Protection

Windblown Dust

- Evaluation:
  - Has the client or planner observed any windblown PM/dust issues, and have any practices or techniques been previously applied to address the observed PM/dust issues?

Windblown Dust

- What to do:
  - Apply one or more practices, as necessary, to address the windblown dust issue. Practices may include:
    - CPS 327 – Conservation Cover
    - CPS 329 – Residue and Tillage Management, No Till
    - CPS 345 – Residue and Tillage Management, Reduced Till
    - CPS 342 – Critical Area Planting
    - CPS 373 – Dust Control on Unpaved Roads and Surfaces
    - CPS 375 – Dust Management for Pen Surfaces
    - CPS 380 – Windbreak/Shelterbelt Establishment and Renovation
    - CPS 422 – Hedgerow Planting
    - CPS 589 – Cross Wind Trap Strips

Pesticides

- Evaluation:
  - Are pesticides applied while minimizing pesticide use or using techniques to minimize pesticide drift and/or pesticide volatilization?

Pesticides

- What to do:
  - Apply one or more practices, as necessary, to minimize pesticide use, pesticide drift, and/or pesticide volatilization. Practices may include:
    - CPS 311 – Alley Cropping
    - CPS 380 – Windbreak/Shelterbelt Establishment and Renovation
    - CPS 422 – Hedgerow Planting
    - CPS 595 – Pest Management Conservation System

Carbon Stock

- Evaluation:
  - Is total carbon stock stored in soils and/or perennial biomass stable or increasing?
  - CART:
    - Soils interpretations
    - In-field soil health assessment
    - Pasture Condition Score Sheet
    - Interpreting Indicators of Rangeland Health
  - Can also use COMET-Farm or COMET-Planner

Carbon Stock

- What to do:
  - Apply one or more practices, as necessary, to maintain or improve carbon stocks. Practices may include:
    - CPS 327 – Conservation Cover
    - CPS 329 – Residue and Tillage Management, No Till
    - CPS 336 – Soil Carbon Amendment
    - CPS 345 – Residue and Tillage Management, Reduced Till
    - CPS 380 – Windbreak/Shelterbelt Establishment and Renovation
    - CPS 420 – Wildlife Habitat Planting
    - CPS 512 – Pasture and Hay Planting
    - CPS 550 – Range Planting
    - CPS 666 – Forest Stand Improvement

Confined Animal Activities

- Evaluation (for PM and odors):
  - Has the client or planner observed any PM/dust or odor issues associated with confined animal activities, and have any practices or techniques been previously applied to address the observed issues?
  - Can also use NAQSAT

Confined Animal Activities

- Evaluation (for manure management – GHGs, Ozone, and Airborne Reactive Nitrogen):
  - Is manure managed only as a solid or is there any liquid/slurry manure management?
  - Can also use NAQSAT

Confined Animal Activities

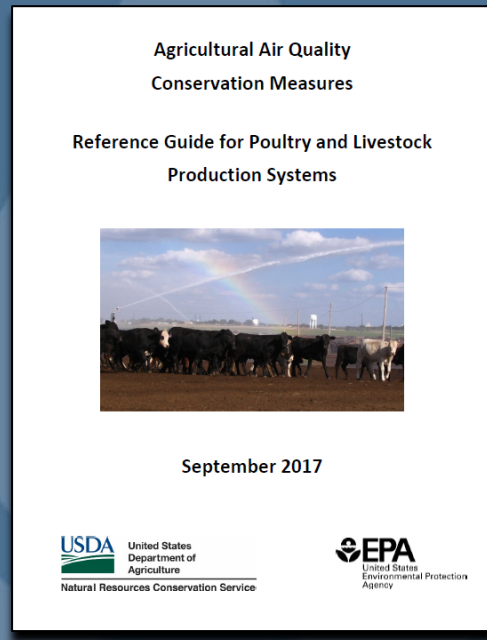
- Evaluation (for feed management – GHGs and Airborne Reactive Nitrogen):
  - Feed confined livestock according to a NRCS-approved feed management plan that specifically addresses nitrogen excretion
  - Can also use NAQSAT

Confined Animal Activities

- What to do:
  - Apply one or more practices, as necessary, to address the appropriate resource concern. Practices may include:
    - CPS 366 – Anaerobic Digester
    - CPS 367 – Roofs and Covers
    - CPS 371 – Air Filtration and Scrubbing
    - CPS 375 – Dust Management for Pen Surfaces
    - CPS 380 – Windbreak/Shelterbelt Establishment and Renovation
    - CPS 442 – Sprinkler System
    - CPS 591 – Amendments for Treatment of Agricultural Waste
    - CPS 592 – Feed Management

Additional Resources

- USDA/EPA Agricultural Air Quality Conservation Measures Reference Guides
  - Cropping Systems and General Land Management
  - Poultry and Livestock Production Systems
- USDA Dust Mitigation Handbook
  - https://dust.swclimatehub.info/



Questions?

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