Manure Management Public Consultation Meeting

Agenda

Welcome and Introduction
Manure Management Measures
Manure Management Protocols
Open Discussion

Sept. 5, 2007 - Sacramento, CA
Welcome and Introduction

Linda Murchison
September 5, 2007
Purpose of Today’s Meeting

- First in a series of workshops on manure management strategies
- Explore potential approaches and strategies
- CCAR manure digester protocol
- Invite suggestions from all stakeholders
Background

- Climate Action Team Report
- CCAR Protocol
- First Early Action Report
- Scoping Plan needs to quantify emission reductions to achieve 2020 target
AB 32 Timeline

- 2007: Publish list of early actions
- 2008: Mandatory reporting & 1990 Baseline
- 2009: GHG reduction measures operative
- 2010: Publish scoping plan
- 2011: Adopt enforceable early action regulations
- 2012: GHG reduction measures adopted
- 2020: Identification/implementation of further emission reduction strategies

- GHG reduction measures adopted
- GHG reduction measures operative
- Publish scoping plan
- Mandate reporting & 1990 Baseline
- Publish list of early actions
Collaborative Process

- Public Agency Involvement
  - Air Resources Board
  - Climate Action Team and Subgroups
  - Energy Commission
  - Public Utilities Commission
  - Water Board, Regional Board
  - California Integrated Waste Management Board
  - Local Air Districts
  - California Climate Action Registry

- Engage all stakeholder groups in an extensive and transparent public process
Next Steps

Today
- Present our process and goals
- Receive your ideas and concepts

Moving Forward
- Incorporate suggestions and maintain an ongoing dialogue with stakeholders
- Series of focused workshops and workgroups over the next year
Today’s Agenda

Manure Management Measures: Kitty Howard

Manure Management Protocols:
  Voluntary GHG Reductions: Shelby Livingston
  CCAR Overview and Protocol Development:
    Derek Markolf
  CCAR Protocol: Kevin Eslinger

Open Discussion

Adjourn
Greenhouse Gas Reduction: Manure Management Strategies

Kitty Howard
Sept. 5, 2007
Overview

- Today’s Goal
- Ground Rules for Strategies
- Background
- ARB’s Process
- Activities to Date
- Call for Information
- Next Steps
- More Information
- Discussion
Today’s Goal

- Start Public Process for Identification and Development of Manure Management Strategies

- Solicit Your Help in Information-Gathering Phase
Ground Rules for Strategies

- Rely upon best available economic and scientific information
- Assess existing and projected technological capabilities
- Achieve the maximum technologically-feasible and cost-effective GHG reductions
- Do not interfere with efforts to achieve and maintain federal and state ambient air quality standards and to reduce toxic air contaminant emissions
- Ensure that GHG reductions are real, permanent, quantifiable, verifiable, and enforceable
Manure Management Sources

- ARB Inventory Categories
  - Sheep, Goats, Horses, Swine, Poultry, Cattle
    (Dairy Cows and Other Cattle)

- Other Categories
  - Zoos, Fairs, Racetracks, Breeding Facilities, Research, Shelters
Manure Management Emissions

- **GHGs**
  - 1990 Levels
    - 5 MMT CO$_2$ E (1% of total GHG inventory)
  - 2004 Levels
    - 7 MMT CO$_2$ E (1% of total GHG inventory)

- **ROGs**
  - 1990 Levels
    - 77 Tons Per Day (TPD) (2% of total ROG inventory)
  - 2004 Levels
    - 89 TPD (4% of total ROG inventory)
  - 2006 Levels
    - 89 TPD (4% of total ROG inventory)

- **PM$_{10}$**
  - 1990 Levels
    - 28 TPD (1% of total PM inventory)
  - 2004 Levels
    - 33 TPD (2% of total PM inventory)
  - 2006 Levels
    - 33 TPD (2% of total PM inventory)
ARB’s Process

- Gather and evaluate information
- Solicit stakeholder input
- Conduct needs assessment
- Develop, propose, and prioritize options
  - Voluntary and/or regulatory measures
  - Recognize/Encourage early reductions
- Develop Schedule
- Hold public meetings, expand outreach, obtain first-hand knowledge
- Make recommendations to our Board
Activities to Date

- Established website and list serve
- Getting out into the field
- Introducing ourselves to the stakeholders
- Gathering Information
  - Understanding how the industries operate (financial, other regulations, large vs. small, culture)
  - Identification and initial evaluation of technologies and practices
  - Evaluation of current rules and regulations
Technologies and Practices

- Aeration
- Anaerobic Digestion
- Biochemical Treatment
- Composting
- Covered Lagoons
- Enclosed Barns
- Feed Management
- Gasification
- Incineration
- More Frequent Flushing, Scraping, and Vacuuming
- Pyrolysis
Several air districts have rules related to manure management

- Amador APCD
- Butte County APCD
- Great Basin APCD
- Imperial County APCD
- Sacramento Metropolitan APCD
- San Joaquin Valley APCD
- South Coast AQMD
- Yolo-Solano AQMD
Call for Information

- Help Us Identify Additional:
  - Stakeholders
  - Technologies
  - Research
  - Sources
  - Cost information
  - Incentive programs

- Get back to us by September 24, 2007
Next Steps

- Field visits
- Continued information gathering and evaluation
- Public outreach
- Future public meetings
Discussion
Voluntary Manure Digester Protocol Meeting Outline

- Voluntary GHG Reductions: Shelby Livingston
- CCAR Overview: Derek Markolf
- CCAR Livestock Protocol: Kevin Eslinger
- Next Steps
- Open discussion
Introduction

Voluntary Greenhouse Gas Reductions:
Manure Digester Protocol

Shelby Livingston
Sept. 5, 2007
Overview

- Background on Voluntary GHG Reductions
- ARB Process
- CCAR Protocol
Voluntary Reductions

- Not required by any law or regulation
- May be reported
- If reported, they must follow established calculation and verification guidelines or protocols
- Important aspect of achieving GHG emission reduction goals
Voluntary Reduction Protocols

- Protocols provide:
  - Basis for quality accounting
  - Methodology for calculating GHG emissions and emission reductions
  - Standard eligibility rules, monitoring instructions, and procedures for reporting project information
California Climate Action Registry (CCAR) developed a Livestock protocol for greenhouse gas accounting for manure digesters

- Extensive CCAR public process and expert review
- Approved by CCAR Board in June of 2007
- AB32 requires ARB to use California Climate Action Registry (CCAR) protocols
ARB’s Process & Goals

- Hold public meetings on the CCAR protocol to inform the public and provide opportunity for questions & comments
- Consider taking the voluntary CCAR livestock protocol to our Board for endorsement for voluntary purposes
- Overall goal – to encourage early voluntary GHG emissions reductions
ARB Process for New Protocol Development

- Recognition of the wide variety and varying complexity of voluntary GHG emission reduction projects and activities
- One-size doesn’t fit all, new approaches and applications will continue to be developed by ARB and CCAR in full public consultation
- ARB staff will be exploring avenues for addressing additional project types
Voluntary Manure Digester Protocol Meeting Outline

- Voluntary GHG Reductions: Shelby Livingston
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The Livestock Project Reporting Protocol

CARB Public Consultation Meeting
September 5, 2007

Derek Markolf
Senior Policy Manager
Overview

- What is the California Climate Action Registry?
- What are project protocols?
- How was the Livestock project protocol developed?
- ARB staff will discuss the protocol in more detail.
Background on the Registry

- Established as a business initiative
- Public/private partnership created by state legislation in 2000
  - Create a GHG accounting standard
  - Encourage voluntary public reporting and early actions for reduction
  - Board represents business, government, NGOs
- Defines a “standard of excellence” in California
Role of Protocols

- Detailed accounting standard
  - Gives step-by-step guidance in measuring emissions and ensures that “a ton is a ton” across different organizations
- Two types: Entity and Project
- Entity protocols – footprint for an organization, snapshot
Project Protocols

- GHG Project: Specific project that reduces GHG emissions or increases GHG sequestration
- Projects are generally done for trading purposes
- Protocol is the tool that determines the GHG impact of the project activity
Project Protocol Components

- Define the GHG reduction project
- Determine eligibility (e.g., “additionality”)
- Establish the accounting boundary
- Calculate GHG reductions
  - Baseline emissions
  - Project emissions
- Verify project performance
- Register GHG reductions
Registry Core Values

- Engage industry experts and public stakeholders in protocol development process
- High quality standards
- Error on side of conservatism
Livestock Protocol Development Process

- Scoping meeting – April 2006
- Literature review and discussion paper production
  - Options and recommendations
  - A Protocol seed document
- Form workgroup – October 2006
- Develop draft protocols
- Public review – May 2007
- Board approval – June 2007
The Protocol Workgroup

- CA Air Resources Board
- CA Department of Food and Agriculture
- California Farm Bureau
- Western United Dairymen
- U.S. EPA
- The Center for Energy Efficiency and Renewable Technology
- Environmental Defense
- UC Davis
- Applied Geosolutions
- AgCert
- The Dolphin Group
- Inland Empire Utility Agency
- Manitoba Agriculture, Food and Rural Initiatives
- Sustainable Conservation
Currently project activity is anaerobic digester only
- Baseline methodology well suited for other project activities to be added in future

N2O impacts not currently included in project protocol due to level of uncertainty in available emission factors
- As methods to calculate N2O emissions at the farm level become available the Registry will incorporate them into this protocol.
Contact Information

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Manure Digesters

- Store manure & enhance digestion (anaerobic = in the absence of oxygen)
- Capture methane biogas produced by the naturally occurring anaerobic microbes (methanogenic bacteria)
- Make use of the biogas by…
  - burning/flaring it,
  - combusting it in an engine to generate electricity,
  - or purifying & injecting it into natural gas pipelines
CCAR’s “Livestock Project Reporting Protocol” Overview

- Provides methodologies for calculating greenhouse gas (GHG) benefits of manure digesters
- Encompasses multiple digester technologies
- Allows for additions, revisions, & updates
Source of Protocol Methodologies

- Derived from international methodologies
  - Kyoto Protocol’s Clean Development Mechanism (CDM)
    - ACM0010
  - EPA’s Climate Leaders Program
    - Draft Manure Management Offset Protocol
CCAR Protocol Details

- Designed for bovine & swine manure digesters
- Variables include:
  - Animal size & population
  - Volatile solid excretion
  - Feed energy
  - Maximum methane producing capacity
  - Methane collection & destruction efficiencies
  - Ambient average temperature
CCAR Protocol Details, cont.

- What emissions are included?
  - CH4
  - CO2

- What emissions are excluded?
  - CO2 resulting from burning biogas
  - Indirect emissions benefits of displacing grid electricity
  - N2O (currently)
Project boundaries

- Includes everything affected by installation of a digester
  - Waste production
  - Waste treatment & storage
  - Waste disposal
  
  E.g. changes in emissions resulting from transporting manure
Eligibility

- **Additionality**
  - Emissions reductions and/or activity (installing a digester) must exceed what is required by law
  - Must meet all air & water quality regulations

- **Location**
  - Must be based in the U.S.
CCAR Protocol Details, cont.

- Monitoring
  - Direct measurement
    - Continuous rate of biogas flow
    - Methane concentration of biogas to the combustion devices

- Reporting
  - All CH4 & CO2 emissions
  - No “de minimis” reporting provision

- Certifying
  - Annual certification by an approved entity
CCAR Protocol Development Process

- Initiated “Livestock Project Reporting Protocol” development in April 2006
  - Performed extensive public/stakeholder review which involved:
    - CA Farm Bureau, CA Dept. of Food & Ag, Center for Energy Efficiency & Renewable Technology, Environmental Defense, UC Davis, EPA, Western United Dairymen, SMUD, Bioenergy Solutions, Provost & Pritchard, CARB, and many others
- Adopted by CCAR Board in June 2007
How It Works in the Real World

- Information required for protocol calculations:
  - From tables in protocol
    - Methane Conversion Factors
    - by temperature (avg monthly) and by system (confined, grazing, etc.)
    - Volatile Solids by livestock category & system
How It Works in the Real World, cont.

- Reporting Parameters
  - Form 1 - General information (examples)
    - For dairy
      - Breed
      - # of lactating/dry/replacement cows & manure fraction
      - Types of manure collection & frequency
    - For swine
      - Type of swine operation
      - Animal types & #s
How It Works in the Real World, cont.

- Reporting Parameters
  - Form 2 - Biogas control system (examples)
    - Type of digester (mixed, plug-flow, covered lagoon, etc.)
    - # & type of animals
    - Average live weight or average milk production
    - Manure &/or wastewater volume
    - Manure treatment before & after digestion
    - Method of digester effluent storage
How It Works in the Real World, cont.

- Reporting Parameters
  - Form 3 – Biogas utilization information
    - How biogas is being utilized (boiler, electricity, flare, etc.)
    - Type of engine-generator set, flare, etc.
    - Pretreatment of biogas
    - Exhaust gas emissions control
Discussion Points

- Science
  - Cross-media impacts

- Policy
  - Interagency issues
  - Permits
  - Co-digestion
  - General order

- Marketability/Feasibility
  - Cost
  - Incentives
Next Steps

- Consider taking the protocol to our Board for endorsement
- Moving forward with a series of workshops over the next year
  - Address potential improvements to the existing protocol
  - Initiate the process for development and adoption of a voluntary verification & enforcement regulation
For More Information

- Manure Management Websites:
  - ARB Manure Management homepage
    http://www.arb.ca.gov/ag/manuremgmt/manuremgmt.htm
  - Manure management strategies
    http://www.arb.ca.gov/ag/manuremgmt/measures/measures.htm
  - Manure management protocols
    http://www.arb.ca.gov/ag/manuremgmt/protocols/protocols.htm

- Manure management list serve:
  - http://www.arb.ca.gov/listserv/manuremgmt.htm
Contacts

- Manure Management Measures
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- Manure Protocol
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