

# **Biodiesel Working Group Meeting**

**March 20, 2007**

**9:00 AM-1:00 PM**

**Conference Call Access (866) 747-3140**

**Pass Code 2264298#**

**Web Cast: <http://www.arb.ca.gov>**

# Agenda

- Introductions
- Update of Draft Biodiesel Advisory
- Biodiesel research study
  - Biodiesel emissions evaluation
  - NOx formation and mitigation evaluation
  - Multi-media evaluation
- Presentation by others
- Open discussion

# Introductions

Dean Simeroth, Chief  
Criteria Pollutants Branch

Gary M. Yee, Manager  
Industrial Section

Robert Okamoto,  
Staff Air Pollution Specialist

# **Draft Biodiesel Advisory**

## **Purpose:**

Clarify the use of biodiesel with respect to existing ARB regulations and provide guidance on the voluntary use of biodiesel.

# Comments

Consider:

- Definition to address mono-alkyl esters
- Joint Advisory with DMS
- ASTM efforts
- Efforts to ensure fuel quality
- Biodiesel blending with California diesel fuel

# **Discussion**

# **Draft Biodiesel Research Study**

- Biodiesel emissions evaluation
- NOx formation and mitigation evaluation
- Multi-media evaluation

# **Biodiesel Emissions Evaluation**

## **Objectives:**

- Fully evaluate emissions
- Address NO<sub>x</sub> impact



# **NO<sub>x</sub> Formation and Mitigation Study**

## **Objective:**

Investigate the mechanism of NO<sub>x</sub> formation and evaluate possible NO<sub>x</sub> mitigation options

- Changes in fuel specifications-match blending
- Refinery process
- Additives

# **Pollutants**

- Criteria emissions
- Toxic pollutants
- Selected greenhouse gases
- Other species
- Biological assays and chemical analysis

# Test Design

- Integrate Emission and NOx mitigation evaluation
- Reference fuels: CARB and U.S. EPA 15 ppm sulfur
- Feedstocks: Soy and recycled grease
- Blend levels: B5, B20, B50, and B100
- Engine and chassis dynamometer
  - Up to two engines tested
  - Up to four vehicles tested (on-road and off-road)
  - Up to three test cycles
- Possible study expansions: Additional engines, LD vehicles, feedstocks, emission controls, toxics

# Comments

- Engine, fuels, and test cycle selection
- Harmonize with US EPA biodiesel test program
- Create an advisory group to assist design of studies

# Coordination with Stakeholders

- Form an advisory group
  - CRC, U.S. EPA, NBB
  - Other stakeholders
- Coordinate with US EPA biodiesel emissions study

# **Coordinate with US EPA Biodiesel Emissions Study**

- Areas of common or overlapping interest
  - Engine selection
  - Fuel selection
  - Test cycle selection
- Areas where there are differences
  - NOx mitigation and multimedia
  - ARB wider range of emissions tested: characterization of unregulated chemical species, ultrafines, and biological endpoints
  - More biodiesel blend levels tested
  - Chassis dynamometer tests

# **NO<sub>x</sub> Mitigation Study**

- Follow-on work could be done at ARB heavy duty emissions test facility
  - Requires upgrade of the engine dynamometer

# **Important Issues to Resolve**

- Criteria for engine/vehicle selection
- Criteria for fuel selection
- Selection of test cycles
- Work out details of the advisory group
- NOx mitigation study-rely heavily on advisory committee to address:
  - Additives tested
  - Define refinery process
  - Second generation biodiesel fuels tested
  - Update ARB engine dynamometer at additional cost



# **Research Team**

- UCR CE-CERT
  - Modern engine test facility
- UCD
  - Unique capability to conduct toxic and biological sampling and analysis
- ARB
  - In-house chassis dynamometer testing and unregulated emissions including ultra-fine particle testing

# **Estimated Cost**

- Biodiesel Emissions characterization study
  - Estimated core cost \$750,000
  - Additional funding address other issues such as additional feedstocks and vehicles/engines
- Biodiesel NO<sub>x</sub> mitigation study
  - \$450,000

# **In Kind Contributions Needed**

- Fuels
  - Biodiesel and biodiesel blends
  - CARB diesel
- Fuel specification analysis
  - ASTM D975
  - ASTM D6751
  - Blend level measurement
- Engines/Vehicles to be tested
  - Longer term commitment
  - Shorter term commitment
- Double up with US EPA with biodiesel fuels and engines

# **Multimedia Evaluation**

## **Objectives:**

- Evaluate impact of biodiesel and biodiesel blends relative to CARB ULSD fuel
- Consider feedstocks common to California

# **Multimedia Research Team**

- UCD/UCB team
- Principle Investigators
  - Tom McKone, UCB
  - Tim Ginn, UCD

# **Estimated Cost of Multimedia Evaluation**

- Estimated cost about \$400,000

# **Discussion**

# **Presentation by Others**



# Open Discussion