

Alternative Fuels

William D. Willets, P.E.

Engineering Supervisor

North Carolina Division of Air Quality

Permitting Section

Alternative Fuels

- Recycled oils
- Waste oils
 - On-site generated
 - Salable fat and used cooking oils
- Biofuels
 - Biodiesel
 - Ethanol
 - Biomass

Renewable Energy and Energy Efficiency Portfolio Standard (REPS)

- S.L. 2007-397
- Provides incentives to generate electricity using renewable resources

Recycled Oils

- Meet specifications to qualify as unadulterated fossil fuels
- Specifications found in the Recycled Oil Management Plan
(<http://daq.state.nc.us/toxics/wasteoilplan.pdf>)

Waste Oils

- May burn up to 500 gallons per year of on-site generated waste oils (KO memo May 28, 2004)
- Some rendering facilities permitted to burn animal fats and similar materials
- Additional testing for those fuels may be required in the future

Biodiesel

- Mono alkyl esters of fatty acids
 - Not raw vegetable oil
- Produced from animal or plant fats through transesterification process
- Uses alcohol and caustic catalyst
 - Typically methanol and sodium hydroxide
- ASTM D6751

Biodiesel (cont'd)

- Byproducts include glycerine, sodium or potassium methoxide and methanol
- Methanol recovered for reuse
- Methoxide sometimes neutralized to allow for purified glycerin
- Some trying to burn glycerin/methoxide mixture

Biodiesel (cont'd)

- Manufacturing facilities typically synthetic minor and subject to NSPS Subparts NNN and RRR and possibly VV (LDAR)
- Fuel can be used in mobile or stationary sources

Ethanol

- Produced by fermentation of sugar based or cellulosic feed stocks
- Manufacturing facilities typically synthetic minor; no longer considered “chemical processing” for NSR and title V purposes (fr01my07-11)
- Typically used in mobile sources in combination with gasoline (10 to 85% by volume)
- Reduction in fuel economy; possible negative energy balance

Biomass

- Typically wood
- May be wood waste triggering toxics
- Requires BACT analysis
- Dirtier on a per MW basis than supercritical pulverized coal