

**Biodiesel Permitting Issues**  
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WPC, Inc. provides our services with 225 staff in the southeast and provides design and construction testing efforts for new biodiesel and ethanol plants or other projects. We are currently working on site remediation, Brownfields, and permitting for the Spring Hope Biofuels project east of Raleigh, a Phase I Environmental Site Assessment for an Augusta, GA cellulosic ethanol project, a permitting for a biodiesel facility in Hemingway, SC, and we recently completed compliance plans for a Charleston, SC Biodiesel project, and evaluation of the wastewater system for an ethanol project in Monte Vista Colorado.

There are a number of air pollution control regulations under the Federal Clean Air Act that potentially impact biodiesel production facilities, and some of our clients are being hit with these regulations, but we have found that the various states are imposing these regulations sporadically. EPA Region V in Chicago has recently confirmed that several of the SOCOMI regulations described below apply to biodiesel facilities (George Czerniak, chief of the EPA's Air Enforcement and Compliance Assurance Branch correspondence to Wisconsin DNR dated December 1, 2006). As a result, WPC has coordinated with EPA Region 4 legal staff for clarification and attempts to exempt biodiesel production facilities from these burdensome requirements. These requirements are operationally onerous, and can delay permitting from a typical three month period to a process that takes twelve months or more based on triggering NSPS requirements for air pollution control permits.

Permitting engineers at various states hold that the biodiesel production reaction produces glycerin (also referred to as glycerol) as a byproduct. Glycerol is listed as a Synthetic Organic Chemical Manufacturing Industry (SOCMI) chemical. Processes that produce SOCOMI chemicals as products, byproducts, co-products or intermediates may be subject to applicable New Source Performance Standards (NSPS), as promulgated under 40 CFR 60, for SOCOMI processes. NSPS are designed to control emissions of Volatile Organic Compounds (VOC) by imposing emissions limits, equipment standards, and performance standards on new installations.

Biodiesel production processes that cause emissions of chemicals and materials that have been identified as Hazardous Air Pollutants (HAP or HAPs) must be evaluated related to National Emissions Standards for Hazardous Air Pollutants (NESHAPs) as promulgated under 40 CFR 61 and 40 CFR 63. The NESHAPs promulgated under 40 CFR 63 are known as Maximum Achievable Control Technology (MACT) Standards.

We have also noted that various state have held that 40 CFR 60, Subparts Kb (NSPS for Volatile Organic Liquid Storage Vessels), V V (NSPS for SOCOMI Equipment Leaks of VOC), NNN (SOCMI Distillation Operations), and RRR (SOCMI Reactor Processes) potentially apply to biodiesel production operations. If a storage tank has a capacity of 20,000 gallons or more, then Subpart Kb would apply when relatively high vapor pressures (e.g., methanol) organic liquids are present. Subparts NNN and RRR may also apply except for specifically exempted batch processes, If the processes are continuous, then biodiesel production facilities are required to comply with these regulations. Subpart V V does not exempt batch processes, and therefore applies to both continuous and batch facilities, except for equipment that is in vacuum service. Only those unit operations that operate under vacuum (which is sometimes the case because such operation facilitates alcohol recovery) would be exempted from some of the requirements, but the vacuum unit operations would be subject only to some record keeping requirements under

Subpart V V. If a plant has some units in vacuum service and others under atmospheric or greater pressure, then those unit operations must comply with all of the regulatory requirements.

There is a size related exemption for each of the three SOCFI-related subparts for small facilities, and such exemptions are based on design capacity to produce chemicals rather than on potential-to-emit. The exemptions for Subparts NNN and RRR apply to sources “with a total design capacity for all chemicals produced within that unit of less than one gigagram per year”. The exemptions for Subpart VV apply to sources that have “the design capacity to produce less than 1000 Mg/yr”, which doesn’t specify whether the production limit applies to all chemicals produced (as is specified in Subparts NNN and RRR) or to SOCFI chemicals only.

The following guidance concerning the exemption clauses was provided by Rick Colyer of EPA:

“...the design capacity exemption in Subpart VV applies only to the design capacity for SOCFI chemicals produced as intermediates or final products. The Subpart V V design capacity exemption does not apply to the production of products that are not listed SOCFI chemicals. This is indicated in the preamble for the final Subpart VV regulation (48 Federal Register 48328 – October 18, 1983), which states – EPA is exempting from the standards facilities producing less than 1,000 megagrams (Mg) of SOCFI chemicals per year ....”

Additionally, the federal regulation continues,

“However, unlike the Subpart VV exemption, the design capacity exemption provided in Subpart NNN does not apply only to the production of SOCFI chemicals. As explained in the background document for Subpart NNN (EPA-450/3-83-005b, June 1990), the low capacity exemption does not pertain only to the production of chemicals listed in Section 60.667. The EPA exempts any distillation from coverage by the standards, except for recordkeeping and reporting requirements, when the process unit has a total design capacity less than 1 Gg/hr (2.2 million lbs/yr) of all products manufactured by the process unit. This includes all listed and unlisted chemicals.”

Presumably, since the wording concerning the small facility exemption in Subpart RRR is the same as in Subpart NNN, the guidance for the two rules in this area would also be the same.

The Maryland Department of the Environment (MDE) identifies volumetric requirements for biodiesel plants, as follows:

Batch Plants:

1 gigagram/yr =  $10^9$  grams/yr = 1102.3 tons/yr = the NSPS small source exemption level, which for Subpart VV (the only SOCFI-related subpart that applies to batch plants) takes into account only the amounts of SOCFI chemicals produced.

Density of biodiesel = 7.33 lbs/gal

Density of anhydrous glycerol = 10.55 lbs/gal

Production of anhydrous glycerol is approximately 10% of that of biodiesel

1,000,000 gallons biodiesel x 7.33 lbs/gallon / 2000 lbs/ton = 3,665 tons biodiesel

3,665 tons biodiesel x 0.10 = 366.5 tons anhydrous glycerol per MM tons biodiesel produced

1102.3 tons glycerol/366.5 tons glycerol per MMgal biodiesel = 3.01 MMgal biodiesel that can be produced before the exemption level for applicability of Subpart VV is exceeded.

So for a batch biodiesel production facility that has a design capacity  $\leq 3.0$  MMgal biodiesel/yr none of Subparts VV, NNN and RRR would apply. This assumes valid the assumption that glycerol production is 10% of biodiesel production. The validity of the assumption would have to be determined on a case-by-case basis. For batch biodiesel plants that exceed 3.0 MMgal biodiesel/yr only Subpart VV would apply.

#### Continuous Plants:

1102.3 tons/yr = the NSPS small source exemption level, which for Subparts NNN and RRR applies to all chemicals produced (combined total of SOCFI and non-SOCFI chemicals)

Again assume that production of anhydrous glycerol is approximately 10% of that of biodiesel

X tons biodiesel/yr + 0.1X tons glycerol/yr = 1102.3 tons chemicals produced/yr; therefore X = 1002 tons biodiesel, which would be the exemption level for biodiesel production at plants subject to Subparts NNN and RRR (i.e., continuous plants).

1002 tons/yr x 2000 lbs/ton / 7.33 lbs biodiesel/gal = 273,397 gallons biodiesel/yr.

So, if the assumption concerning the ratio of biodiesel production to glycerol production is valid, then for a continuous plant that produces more than 273,397 gallons but less than 3.0 MM gallons of biodiesel, Subparts NNN and RRR would apply. For continuous plants that exceed 3.0 MMgal biodiesel/yr all three SOCFI-related Subparts would apply.

#### **40 CFR 63 (MACT Rules):**

A biodiesel plant that is a major source of HAP (i.e., has a potential-to-emit  $\geq 10$  tpy of an individual Hazardous Air Pollutant, or HAP or  $\geq 25$  combined total tpy of all HAPs), or is located at a premises that is a major source of HAP, would be subject to 40 CFR 63, Subpart FFFF (the so-called MON rule for Miscellaneous Organic Chemical Production and Processes). Methanol, which is a typical raw material in biodiesel production, is a HAP, but generally emissions of methanol from biodiesel facilities can be expected to be less than the major source level. Glycerol is not a HAP.

Additionally, there is the potential that a biodiesel facility that either stores methanol under pressure (unlikely) or uses methanol in a process under pressure and heat (a distinct possibility) would be subject to the RMP regulations 112(r) because although there is no quantity listed for methanol, there is the possibility for inclusion under the "Boiling Liquid Vapor Explosion" requirement, if, for example, a process tank with a 20% methanol concentration were to rupture, the release would cause a boiling of the methanol at the lower pressure and trigger this requirement.

#### Other Permits Required

In addition to the discussion above, we identified other state and federal requirements as listed below, and while not meant to be the sum total of every permit needed, it gives an idea of the level of requirements which may vary from state to state:

LICENSE/REGISTRATION TYPE	GOVERNMENTAL BRANCH	LEAD TIME
1. Business Name Registration	Secretary of State	2 weeks
2. Federal Tax Number	U.S. Department of Treasury Internal Revenue Service	10 min/phone
3. Business License	City Government	Varies
4. Building Permit	County Government	Varies
5. Erosion and Sediment Control Plan (Needed for building permit)	U. S. Department of Agriculture Natural Resource Conservation Service State Soil and Water Conservation Commission	30 days
6. State Tax Registration Number	State Department of Revenue	14 days
7. Motor Fuel Distributor License	State Department of Revenue	14 days
8. Product Registration	State Department of Agriculture	14 days
9. Application for Registration (Form 637) Blender's /Distributors License	U.S. Department of Treasury Internal Revenue Service	Varies
10. Fuels Program Company/Entity Registration (EPA Form No.3520-20A)	U.S. Environmental Protection Agency	14 days
11. Diesel Programs Facility Registration (EPA Form No. 3520-20B1)	U.S. Environmental Protection Agency	14 days
12. Fuel Manufacturer Notification for Motor Vehicle Fuel (EPA Form No. 3520-12)	U.S. Environmental Protection Agency	Before producing
13. Fire Safety Analysis Worksheet	Office of Commissioner of Insurance Local Fire Department	30 days
14. Plans Transmittal and Tank Spill Control Certification	Office of Commissioner of Insurance State Fire Marshall	30 days
15. Hazardous Materials Inspection Report	Office of Commissioner of Insurance Regional Fire Marshall	30 days
16. Plan Review Process	Office of Commissioner of Insurance State Fire Marshall	30 days

17.	State Air Permit	Environmental Protection Division Air Protection Branch	a. 60-90 days
a.	Minor Source (B) or Synthetic Minor (SM) Permits		b. 9-12 months
b.	Major Source (Title V) Permit, Subparts NNN, RRR, VV		
18.	Boiler Permit	State Department of Labor	120 days before construction
19.	Boiler Inspection Includes all pressure vessels	State Department of Labor	Before producing
20.	Rail Inspection	State Transportation Department and Servicing RR	60-90 days
21.	Wastewater Permits	City Government, State	1 week-1 year
22.	Well Water and Drilling Permits	City Government, state	Before Construction
23.	Storm Water Pollution Prevention Plan	State Department of Natural Resources	Before Construction
24.	U.S. Army Corps of Engineers Wetlands Review	U. S. Army Corp of Engineers	3-6 months
25.	Process Safety Management	State Occupational Safety and Health Administration (OSHA)	Start at design phase
26.	National Biodiesel Board Membership (Access to required Health Effects Data)	National Biodiesel Board	14 days
27.	BQ9000 Certification	National Biodiesel Board	Once producing
28.	Product Registration	State Department of Agriculture	90 days prior to marketing
29.	State Clearinghouse (Federal and State Grants & Loan Program)	Governor's Office of Planning & Budget	30 days
30.	Fuel Manufacturer Notification for Motor Vehicle Gasoline and Diesel Fuel (EPA 3520-12A)	U.S. Environmental Protection Agency	30 days
31.	Fuel Manufacturer Quarterly Report for Motor Vehicle Gasoline or Diesel Fuel (EPA Form No. 3520-12Q)	U.S. Environmental Protection Agency	30 days
32.	Fuel Additive Manufacturer Notification (EPA Form No.3520-13)	U.S. Environmental Protection Agency	30 days
33.	Supplemental Fuel Additive Manufacturer Annual Report (EPA Form No. 3520-A,B)	U.S. Environmental Protection Agency	30 days