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October 27, 2014

Alexander "Lex" Mitchell  
Air Pollution Specialist  
California Air Resources Board  
Submitted via electronic mail to amitchel@arb.ca.gov

**Re: Official written comments from the National Biodiesel Board on the proposed Alternative Diesel Fuel (ADF) regulation presented October 20<sup>th</sup>, 2014.**

Dear Mr. Mitchell:

We continue to value the positive working relationship we have with Air Resources Board (ARB) staff members. As an organization comprised of environmental entrepreneurs, we appreciate the important role staff fulfills in protecting the public health of California's citizens.

While the October 20<sup>th</sup> draft regulation is a meaningful improvement over the previous regulatory concept, we still believe the significance level should be set at B20. This level is based on air shed modeling studies that utilized data from the South Coast Air Quality Management District (SCAQMD). As we have discussed previously, the totality of data related to biodiesel emissions – namely reductions in particulate matter (PM) and volatile organic compounds (VOCs) – results in a self-mitigating effect, at least up to a 20% threshold.

Ultimately, while the current draft proposal represents a significant step in the right direction, we would be remiss if we failed to mention that it still leaves the industry mired in survival mode at a time when it should be flourishing like never before. Biodiesel benefits the environment, public health, and the economy, while serving as a key player in achieving the goals of the Low Carbon Fuel Standard (LCFS). Biodiesel has never been more important than it is today.

Thank you, in advance, for your consideration of our comments. We appreciate your efforts and look forward to working together in the coming weeks.

Sincerely,

A handwritten signature in black ink that reads "Shelby Neal". The signature is fluid and cursive.

Shelby Neal  
Director of State Governmental Affairs

Biodiesel industry views on key points related to the proposal can be found on this and the following pages.

### **1. Human Health Impacts of Biodiesel**

Biodiesel has played a key role in the LCFS, not only in helping meet greenhouse gas (GHG) reduction requirements, but in creating family-supporting, green jobs in disadvantaged areas of the state. Biodiesel, which is the nation's first U.S. EPA-designated "Advanced Biofuel," is already in commercial production with existing capacity that can be further utilized to provide low-cost, low-carbon fuel to meet the important goals of the LCFS policy.

In addition to reductions in GHG emissions ranging from 50 to 95% relative to petroleum diesel fuel, biodiesel offers the added benefit of reducing criteria air pollutants, producing a direct benefit to human health. Often this health benefit is focused on vulnerable populations such as school children who benefit from B20 used in school buses with older engines.

Biodiesel emission benefits include:

- Reducing unburned hydrocarbons by 67%;
- Reducing carbon monoxide by 48%;
- Reducing particulate matter (PM) by 47%;
- Reducing polycyclic aromatic hydrocarbons by 80%;
- Reducing nitrated PAHs by 90%; and
- Reducing ozone potential of speciated hydrocarbons by 50%.<sup>1</sup>

The impact of these emissions are significant to human health. Nitrated PAHs have been identified as potential cancer-causing compounds. PM emissions have been associated with 130,000 premature deaths annually in the U.S., corresponding to 1.1 million years of lost life.<sup>2</sup> Nationwide, 11.4 percent of PM<sub>2.5</sub> emissions contributing to these deaths originate from transportation and mobile sources. PM<sub>2.5</sub> emissions from mobile sources in California (51,209 tons per year)<sup>3</sup> account for 8.1 percent of national PM<sub>2.5</sub> emissions from mobile sources (626,859 tons per year)<sup>4</sup>. Based on these ratios, approximately 1,200 premature deaths can be attributed to PM emissions from mobile sources in California, and those emissions derive primarily from conventional diesel use. This approximation does not account for health impacts, which are likely to be more severe in densely populated areas where emissions from traffic are concentrated with greater effects on nearby people.

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<sup>1</sup> U.S. EPA; A Comprehensive Analysis of Biodiesel Impacts on Exhaust Emissions; 2002; <http://www.epa.gov/otaq/models/analysis/biodsl/p02001.pdf>

<sup>2</sup> <http://www.epa.gov/blackcarbon/2012report/fullreport.pdf>

<sup>3</sup> California Air Resources Board Emissions Inventory for 2005; <http://www.arb.ca.gov/app/emslv/emssumcat.php>

<sup>4</sup> <http://www.epa.gov/blackcarbon/2012report/fullreport.pdf>

The health benefits of reducing particulate matter emissions include reduced mortality of adults and infants, reduced chronic and acute bronchitis, reduced acute myocardial infarctions, reduced cardiovascular hospital admissions, reduce upper and lower respiratory symptoms, reduced exacerbation of asthma, and reduction in lost work days.<sup>5</sup> The economic benefits of these health impacts range between \$230,000 and \$880,000 per ton of particulate matter reduced.<sup>6</sup> This brings the range of economic benefits to \$110 - \$792 million solely from reducing particulate matter in diesel engines using biodiesel.

In its 2012 Report to Congress on Black Carbon, the U.S. EPA states that control measures which reduce PM<sub>2.5</sub> emissions are “virtually certain to achieve health benefits.” The same report quantifies the benefit from control of direct PM<sub>2.5</sub> emissions up to 300 times greater than the benefits per ton estimated for reductions of precursors such as NOx.<sup>7</sup> Based on this, the PM reduction of biodiesel provides a 30-to-1 benefit ratio for reducing health impacts of PM while sacrificing no significant impact on ozone as a result of NOx emissions.

## **2. Air Quality Modeling Studies**

Both the U.S. Department of Energy and the NBB have commissioned air quality modeling evaluations to assess the overall health impacts of high rates of B20 use in the South Coast AQMD. These studies took into account the entire, unique emissions profile of biodiesel. The evaluations were conducted by Environ, an emissions modeling firm located in Novato, CA.

For its analysis, Environ used ARB and South Coast AQMD sanctioned emissions models and data to evaluate the impact of B20 at 50 and 100 percent penetration levels on heavy duty engines in Southern California during a well-studied ozone event in 1997. Environ updated the study with new estimates in 2013, using current inventories and emissions models. For purposes of the analysis, a 2 to 3 percent NOx increase was assumed for biodiesel use, along with the normal decreases in other pollutants which occur with biodiesel consumption.

The analyses showed the following:

- Both increases and decreases in maximum impacts of ground level ozone that were generally so small that they were not considered measurable;
- The only measurable impacts were *decreases* due to use of B20;
- The maximum decreases with B20 occurred when ozone was at its highest level, which is to say when biodiesel’s benefits were needed most;
- “...the ozone benefits (reductions) are obvious and out-weigh the disbenefits in terms of the magnitude of the peaks and are far more widespread in terms of spatial extent.”

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<sup>5</sup> <http://www.epa.gov/blackcarbon/2012report/fullreport.pdf>

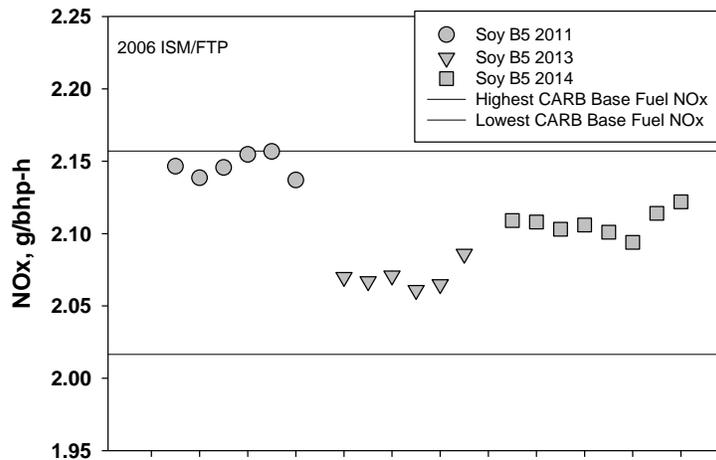
<sup>6</sup> <http://www.epa.gov/blackcarbon/2012report/fullreport.pdf>

<sup>7</sup> <http://www.epa.gov/blackcarbon/2012report/fullreport.pdf>

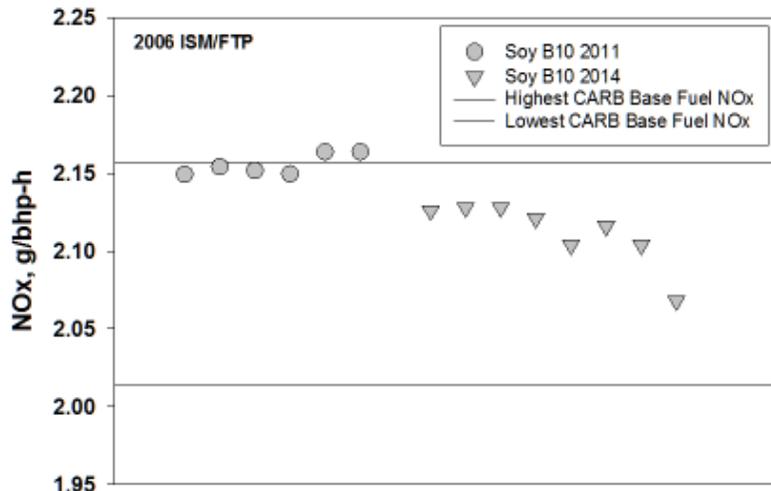
### 3. Technical Evaluation

We believe the three studies that have been conducted on biodiesel should be combined to show the data in a more statistically powerful way. It seems less appropriate to base the regulation only on the most recent study. Below, we have included charts created by the National Renewable Energy Laboratory (NREL) of the ARB/Durbin data from 2011, 2013, and 2014. These plots show the emissions of biodiesel relative to the CARB certified diesel fuel tested.

**The chart below aggregates B5 test results from the 2011, 2013, and 2014 studies, illustrating that all soy biodiesel data points are within the natural variability of the CARB diesel fuel tested.**



**The chart below aggregates B10 test results from the 2011, 2013, and 2014 studies, illustrating that all except 2 of the 14 soy biodiesel data points are within the natural variability of the CARB certified diesel fuel tested. These points are outside the natural variability by 1/100<sup>th</sup> of a gram, far less than what is generally considered measurable.**



#### **4. Additive Pathway for Mitigation**

Although we are not convinced the current marketplace would embrace a mitigation solution that included per-gallon blending of a CARB-approved additive due to cost and infrastructure considerations, we would like the regulation to provide this avenue in the event the marketplace changes during the course of the policy, which could span 10 years in duration. As the carbon intensity standards become more stringent, cost tolerances may increase with it, making additization a viable option at some point in the future.

Additives that may be candidates for certified formulations include cetane-enhancing products such as Oryx, Viscon, and 2EHN. These would be blended at treat rates of less than 1 percent, a fraction of what has been proposed for DTBP in the draft regulatory document. We estimate three years would be necessary to complete the certification testing and receive ARB approvals.

Finally, we request that the ARB clarify in the regulation that the 1991 Detroit Diesel Series 60 engine will be an option for additive certification, at least during the regulation's three-year phase-in period. This is the engine all other fuels currently in the California marketplace have used and the one that the industry has previously utilized for similar testing. It would be beneficial for the biodiesel industry to be able to build on the existing knowledge available for this engine, both in terms of time and financial resources.

#### **5. Implementation Timeframe**

Regardless of regulatory structure and possibility of an "additive solution" for B20, an appropriate timeframe will be needed for the fuel industry (biodiesel producers, wholesalers, retailers, etc.) to develop and implement compliance mechanisms. Industry will need to identify and develop compliance strategies, secure capital to execute those plans, and work through the permitting (local and state) and construction phase of infrastructure development. This will be a significant challenge.

We estimate three years from the regulation's implementation date would be necessary to complete this process though, of course, any realistic estimate would depend upon the complexity and workability of the final regulation. A four-year implementation period would be most beneficial.

## **6. Different Biodiesel Limits During High and Low Ozone Periods**

Based on the technical analysis performed by NREL of the ARB/Durbin data, we believe the Air Resources Board would be on solid ground allowing at least a B10 blend all year around without mitigation. Nevertheless, we do not oppose the framework presented during the workshop regarding B5 and B10, which largely mirrors the current approach utilized in California for regulation of gasoline. We do not believe limiting biodiesel to different levels during two time periods (B5 during the high ozone period, B10 during the low period) would pose a challenge to the wholesale and retail industries.

While it is true that fuel pumps and street signs must accurately reflect when blends above B5 are being sold, it should be noted that dozens of California retailers are already navigating this system today with success. It should also be noted that the B10 winter ozone provision simply presents an opportunity to exceed B5. If a particular retailer prefers not to change his or her pump label and signage, they can simply purchase diesel containing 5% or less biodiesel. In other words, the proposed regulation changes nothing in today's marketplace with regard to pump labels and signage requirements, including the voluntary nature of the system. It simply provides additional opportunities to use biodiesel, improving the state's air quality and decreasing its carbon emissions.

## **7. High and Low Saturation Feedstock Differentiation**

Though we have some anxiety about potential reporting requirements, we support the approach outlined in the regulation, which relies on chemical properties rather than reporting feedstocks.

The draft regulation recommends cetane as a proxy for saturation level. While this is appropriate, we would note that cloud point is just as closely correlated with feedstock saturation level but is much more commonly used in the marketplace and is a much less expensive test to administer. For these reasons, we recommend that biodiesel producers be allowed the option of using either a cetane test or a Celsius cloud point test for purposes of regulatory compliance.

The regulation suggests that a specific cetane level of 56 is needed to qualify as a high saturation feedstock. According to a poll of our members, a value of 54 would be more consistent with what resides in the marketplace. As such, we recommend replacing the 56 value with 54. The corresponding Celsius cloud points for those cetanes would be 8 and 7, respectively. Data demonstrating these correlations can be provided to ARB staff upon request.

During the workshop, staff indicated that cetane enhancing agents could not be added to B100 prior to testing. We believe B100 testing with the cetane enhancing additive should be allowed for two reasons. First, according to data we can share upon request, cetane enhancers do not impact the cetane value of B100. They have no measurable impact until the fuel is blended into petroleum diesel. So while they do likely mitigate NOx in biodiesel blends, they do not actually improve cetane in B100.

Second, industry plans to pursue an “additive solution” for B10 and B20 blends. If an additive formulation is approved, we would need to test the B100 with the additive present, which would likely be a cetane enhancing agent.

We propose the following structure for this provision:

- Producers would be required to submit results from three tests to demonstrate a high saturation feedstock. The average of the three tests would be used to demonstrate compliance.
- Producers would be required to submit tests annually or when the feedstock mix changes significantly. A significant change would be defined as a 20% or greater alteration of any single feedstock component.
- For purposes of compliance, producers could use any of the following: Celsius cloud point test; derived cetane test; or ASTM D613, the primary cetane number test.
- Producers selling a low saturation feedstock would be exempt from any testing and reporting requirements associated with this provision of the regulation.

#### **8. New Technology Diesel Engines (NTDE’s)**

As you know, NTDEs reduce NOx emissions by more than 90% with both biodiesel and ULSD petroleum diesel compared to 2004 model year diesel engines. Because NTDEs adjust their operations to meet emissions standards for NOx regardless of fuel type, testing shows no NOx increases when biodiesel is used in these engine systems up to B20 (little testing has been done on higher blends). Ultimately, fleet turnover mandates under California state law that require a steady transition to NTDEs will provide significant NOx reductions over the course of the next ten years as well as certain NOx neutrality for biodiesel.

#### **9. Applications for Exemptions**

We recommend inclusion of a provision that allows fleets (or fuel retail locations) to apply to the ARB for specific, limited exemptions to the regulation. For example, school systems use B20 because of its significant PM benefits in busses, which emit pollution in close proximity to school children. We believe such fleets should be able to obtain exemptions based on a finding by ARB that positive air quality and public health impacts would occur as a result of higher level biodiesel use.

#### **10. Sunset Date**

NTDE’s currently comprise 31% of the California marketplace and should represent 90% of the market by 2023 as a result of ARB fleet turnover regulations. Based on ARB testing data, we believe the biodiesel provisions should sunset when fleet turnover reaches 80%. Based on the totality of the data available (amount of animal fat biodiesel in the marketplace, etc.), we believe the sunset could be directed at an even lower percentage. We also suggest annual reviews to quantify fleet turnover to ensure biodiesel is not subject to the regulation longer than specified under the rule.