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October 27, 2014

Jim Aguila and Lex Mitchell  
California Air Resources Board  
Submitted via email

Re: Comments on Proposed Alternative Diesel Fuel Regulations

Dear Jim and Lex,

I appreciate the open dialog you continue to maintain with stakeholders, your dedication to the process and your open mindedness... not to mention the endless hours you have put into this. I have read the National Biodiesel Board and California Biodiesel Alliance comments and agree with them, but I would like to emphasize a few points.

1. The benefits of biodiesel outweigh the minor NOx increases, if any. CEQA analysis requires an examinations of the impacts of adopting or not adopting regulations. In this case, regulations on biodiesel will restrict the amount of biodiesel consumed in California, and the default fuel is ARB diesel, which increases CO, PM, VOC, air toxics and greenhouse gases for the marginal benefit of perhaps a slight reductions in NOx in limited circumstances. There is no known viable additive for mitigating NOx that is recognized by ARB, so it is not yet possible to reduce all impacts. In comparison to ARB diesel, biodiesel is the preferred alternative for public health reasons, GHG mitigation and providing green jobs.

2. The ARB solution offered is disproportionate to the temporary gains, if any. If the regulations are targeted for implementation in 2018 and will sunset when the NTDE fleet reaches 90% penetration in 2023, there is only a five year window during which there may be some slight reductions in NOx. It is not worth putting the entire biodiesel industry at risk for this small temporary gain.

3. If mitigation is required it will take at least three years to get the testing done and approved by ARB. Because the substance of the proposed regulations are subject to change, we cannot begin testing additives until the final regulations are passed. Once this occurs we will need to establish test protocols that are acceptable to ARB, enter into a contract with a testing lab, find a time slot at the testing lab, conduct the tests, review and write up the results, and then give them to ARB for review and approval. As you know, based upon your own experience, this entire process can take three years or more.

4. If mitigation is required, exemptions should be broadened. Part of the ARB proposal was to exclude fleets that are 90% or more NTDE's. This should be broadened to exclude fleets with 80% or more NTDE, portions of fleets that can selectively fuel just NTDE's, and filling stations that can verify that higher level blends of biodiesel are just being used in NTDE's. Finally, the B5 threshold in 2018 (or later) should be increased every year to reflect the greater penetration NTDE vehicle miles traveled, or just increased to 10% for the entire time.

5. The ideal resolution will be to find an easily identified characteristic linked to NOx and to set a standard that can be reached with inexpensive, off-the-shelf additives. This would avoid the necessity of time consuming and costly testing to achieve a result that will only be applicable for five years. The following standards are based upon the best available scientific research showing their influence on NOx:

1. A minimum Cetane Number value of 54.0;
2. A minimum Cloud Point value of +7 deg C; or
3. A maximum Iodine Value of 85.

Biodiesel producers should be required to meet any 1 of the 3 approaches to provide the maximum flexibility for compliance. Producers should be required to submit the results for three (3) consecutive batches for any one of the three criteria, with the average value being used to prove compliance and confidence. Thereafter, the Producer would be required to submit an annual (possibly semi-annual) result confirming continued compliance unless there is a significant change in feedstock being used in which case an additional three consecutive batches must be tested (similar in enforcement to the BQ-9000 Quality Assurance Program).

Respectfully submitted,



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**Russell Teall** is the President of BIODICO a company which he founded for the purpose of developing and commercializing bioenergy system technology. Under Dr. Teall's leadership Biodico has successfully evolved patented biorefinery production techniques for a wide variety of feedstocks. Beginning with laboratory-scale demonstrations, these technologies eventually led to full-scale commercial operations in California, Nevada, Colorado, Texas and Australia. These plants utilized Teall's patented process with capacities of 3-10 million gallons per year and produced biodiesel predominantly from recycled fryer oils, with the capability of using a wide variety of other feedstocks, including crude vegetable oils and animal fats. BIODICO is continuing to actively develop improvements to the bioenergy system platform in conjunction with the U.S. Navy at the Naval Facilities Engineering Expeditionary Warfare Center at Naval Base Ventura County in Port Hueneme, California where a production unit is being used for research and development involving innovative renewable energy technologies. The most recent generation of equipment, the ARIES<sup>®</sup> Platform brings automation and remote real-time sensing to bioenergy production as part of an integrated self-sustaining system, utilizing anaerobic digestion, gasification, solar, combined heat and power, and advanced algae cultivation (algaculture).



**Jatropha, Algae and Anaerobic Digestion:** Dr. Teall has been working on jatropha as a biorefinery feedstock since 2002 as part of a study in India funded by the U.S. Agency for International Development and the U.S. Trade Development Agency. This comprehensive study analyzed the types of jatropha available and the economics of jatropha cultivation, harvesting, and processing. Subsequent jatropha studies, test plots and cooperative research have been undertaken in the U.S., Bolivia, Haiti, Paraguay, Mexico, Malaysia, the Philippines, Thailand, Ghana and China. Dr. Teall has also conducted extensive research and development programs with algae and other aquatic species in both open ponds and photobioreactors, and is in the process of commercializing these technologies at the National Environmental Technology Test Site, jointly administered by the U.S. Departments of Defense and Energy, and the U.S. Environmental Protection Agency, located at Naval Base Ventura County. Dr. Teall's research group has extensive experience with anaerobic digestion from small village sized bladders, to large commercial facilities in Los Angeles, Texas and Singapore utilizing waste water treatment effluent, restaurant food waste and agricultural by-products such as manure.

**Background in the Bioenergy Industry:** Dr. Teall has over twenty years of experience in all aspects of the bioenergy industry. He is the former Vice-Chairman of the National Biodiesel Board ("NBB," the trade association for the biodiesel industry in the U.S.) and former Chairman of NBB's Legislative/Regulatory Committee, and is currently President of the California Biodiesel Alliance. Dr. Teall serves on the Afghan Energy Project Technical Advisory Board under the Office of the Chief Scientist of the Central Intelligence Agency, and serves on the California Air Resources Board Low Carbon Fuel Standard Advisory Panel. Dr. Teall has provided biorefinery consulting services to private companies, governments and trade associations throughout the world, including the U.S., Argentina, Australia, Bolivia, Canada, China, Dominican Republic, Ghana, Haiti, Hong Kong and the PRC, India, Israel, Malaysia, Mexico, the Philippines, Singapore, South Africa and Thailand.

**Education:** Dr. Teall is a graduate of the University of California at Santa Barbara (1974), and holds a Juris Doctor degree from the University of California at Berkeley (1977).

**Red Rock Ranch Project:** The Red Rock Ranch project began nine years ago between Biodico and John Diener of Red Rock Ranch, a 5,400 acre ranch originating with the Diener family in 1927. John Diener has been an innovative leader in California agriculture focusing on sustainable water and land management, and renewable fuel and power. A selenium bioremediation project in 2005 brought Teall and Diener together to grow canola on selenium contaminated soil for bioremediation and producing animal feed and biodiesel. Currently Red Rock Ranch serves as a demonstration and validation site for the US Navy for various feedstock, biofuel and bioenergy technologies. It showcases an integrated approach to distributed biofuel and bioenergy production, and includes feedstock research at the adjacent UC Davis agricultural research station, biodiesel and ethanol production from sustainable resources, and renewable cogeneration through gasification of dry agricultural waste such as almond and walnut orchard prunings, anaerobic digestion of wet agricultural waste, and solar combined heat and power. The figure below show a diagram of the integrated system approach.

