AgLand Renewables LLC
1099 E Champlain Dr, Ste A
Fresno, CA 93720
info@aglandrenewables.com
410.514.6488

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The Honorable Liane Randolph, Chair
California Air Resources Board
1001 I Street
Sacramento, CA 95814

RE: Comment Letter in Response to Methane, Dairies and Livestock, and Renewable Natural Gas in California Workshop

Dear Chair Randolph:

Thank you for the opportunity to provide comments following the *Methane, Dairies and Livestock, and Renewable Natural Gas in California* Workshop (Workshop) held by the California Air Resources Board (CARB) on March 29. AgLand Renewables appreciates the focus on reducing emissions in the agricultural sector to help California achieve its climate goals.

AgLand Renewables LLC, the California subsidiary of CleanBay Renewables Inc., owns and develops bioconversion facilities to provide the sustainable processing and conversion of poultry litter into renewable natural gas (RNG) and organic controlled-release fertilizer. AgLand's process combines field-proven Anaerobic Digestion (AD) and Nutrient Recovery (NR) technologies into community scale bioconversion facilities specifically designed to process poultry litter. Unlike most AD projects, these bioconversion facilities are fully enclosed, closed-loop systems, meaning that all water and liquids are reused in the AD process and are not released into the environment. The processing of poultry litter into RNG and organic controlled-release fertilizer will significantly reduce nitrous oxide (N_2O) emissions, which are 300 times more potent than carbon dioxide and 10-15 times more potent than methane.

California is the leader in agricultural production, including poultry, and has a long history of supporting sustainable pollution prevention techniques and technologies to reduce emissions, improve resiliency, and provide economic benefits. AgLand is helping resolve pressing environmental and energy challenges facing California food and agricultural producers and providing low-carbon fuel and waste reduction solutions that substantially reduce greenhouse gas emissions, provide soil, and water quality benefits, and drive economic development in disadvantaged communities in the Central Valley. AgLand plans to install two bioconversion facilities in the Central Valley—home of California's vast poultry production industry—within the next five years. The state-of-the-art facilities will provide a long-term, sustainable source of renewable transportation fuels and controlled-release organic fertilizers that substantially reduce climate pollutants and improve soil health in California.

California is in the top 10 of poultry production in the United States (egg layers and broilers) and generates approximately 700,000 tons of poultry litter annually from over 288 million broiler chickens. Each bioconversion facility would generate 2,250,000 MMBtu's of RNG each year, which would avoid approximately 1,00,000 tons Carbon Dioxide equivalent (CO2e) emissions annually. In addition to generating millions of MMBtus of RNG each year, the two California bioconversion facilities would create 250,000 tons of organic, controlled-release fertilizer each year, which will double the amount of land that California's organic poultry litter can serve organic fertilizers to and avoid harmful, conventional, non-organic chemical fertilizers.

AgLand Renewables is committed to supporting climate smart agriculture and environmental health, particularly in California's most disadvantaged agricultural communities. The controlled released organic fertilizer produced through the bioconversion facilities brings Precision Agriculture to organic farming, as well as helping to improve nitrogen use efficiency and produces greater crop yields with less fertilizer and pesticide use. Organic production is currently limited due to constraints associated with manure, specifically its composition, pathogen issues, and physical properties. Manure in its raw and unmodified form has fairly low nutrient concentrations, high fecal bacterial counts, and low bulk density/high moisture. These characteristics either limit how much can be applied which in turn limits growth rates, or if manure is over-applied to hit target growth rates, there are significant risks associated with fecal bacteria and/or air and water pollution. Whereas organic controlled release fertilizers are engineered and created using specific steps that result in a product with higher nutrient concentrations (i.e. 5-5-5), improved density/crushing strength for precision spreading, and properties designed to dramatically reduce air and water pollution.

In addition, controlled release fertilizers help to maintain and improve crop yields by closely matching plant growth requirements with a more natural nutrient stewardship framework. Nutrient stewardship focuses on the principles of the 4Rs: right source, right rate, right time and right place. In partnership with nutrient management planning, controlled release fertilizer support the 4Rs in a way that conventional fertilizers are unable to meet, as controlled release fertilizer sources are only used as the plant requires nutrients. Specifically, repeated lab and field-based studies have concluded that controlled released fertilizers provide healthy soils that allow for substantial reductions of fertilizer loads and less need for fumigants, fungicides, and pesticide applications.

Market-based programs, such as the Low Carbon Fuel Standard, are essential to deploy these important environmental projects in California. Nitrogen is generally considered the most important nutrient from an agronomic standpoint, but it is also a major source of GHG emissions and causes water quality issues throughout the state. There is a need to account for these N_2O emissions from animal manures and synthetic fertilizers that currently off gas harmful N_2O in massive quantities. N_2O is one of the more stable major greenhouse gasses, and, as a result, it has the potential to perform significant long-term damage to the atmosphere and is the only major greenhouse gas that also destroys the ozone layer. Compared to the 12-year life of methane, the atmospheric lifetime of N_2O is estimated to be about 150 years, which contributes to a global warming potential nearly 300x that of CO_2 before it is degraded back to N_2. In addition, the "Ten New Insights in Climate Science for 2021" named N_2O as the leading non-CO_2 contributor to climate change[1].

There is an opportunity now to include the avoided N_2O emissions to reduce emissions within the LCFS program to help the State's AB 32 emission reduction goals, help further decarbonize transportation fuel, and accelerate substantial reduction of pesticide and fertilizer use and enhance sustainable farming practices. In addition, developing a N_2O avoidance pathway provides the opportunity for market-driven approach to address critically important N_2O emission, without additional regulatory pressure on California's agriculture sector.

In partnership with the Climate Action Reserve and ICF International, AgLand has developed a methodology and approach to calculating nitrous oxide emissions based on fertilizer pollution, including proposed methods for quantification, monitoring, reporting, and verification of avoided nitrous oxide impacts using controlled released fertilizers. Using best practices in GHG accounting, the approach utilizes geographically differentiated emission factors as compared to international or national scale emission factors to calculate the emissions and emission reductions more accurately. We

[1] https://10insightsclimate.science/

look forward to the opportunity to work with ARB to develop an appropriate carbon intensity (CI) score for avoided N_2O emissions associated with feedstocks used in anaerobic digestion for RNG.

Thank you for the opportunity to comment on the recent workshop and for the excellent work that CARB is doing in leading the way in reducing the impact of harmful climate pollutants for California and the entire nation.

Sincerely,

Thomas Spangler
Executive Chairman
AgLand Renewables