June 25, 2007

James W. Morris, Ph.D., P.E.
Chief Technology Officer
Bion Environmental Technologies, Inc.
32 Stoneridge Circle
Standish, Maine 04084-5250

Subject: Greenhouse Gas Emissions Reductions from Bion Technology Applications

Dear Dr. Morris:

Over the past several months, Econergy Consulting has been evaluating the Bion Technology from the perspective of greenhouse gas (GHG) emissions reduction potential. We have developed a computer model which we have used to track the fate and transport of certain GHG emissions (carbon dioxide, methane, and nitrous oxide) through the life cycle of on-farm livestock manure management, both for the baseline (business as usual) scenario and for projects using Bion technology. We have applied the most current, realistic, and widely accepted emissions factors available to us in the development of this model. In addition, we have used what is, in our judgment, a rigorous and comprehensive approach to the GHG reduction calculations.

As part of our evaluation, we also calculated off-farm GHG emissions reduction potential associated with the use of the coarse solids captured from the proprietary Bion process as a carbon-neutral alternative fuel to offset the burning of fossil fuels for combined heat and power generation. In the particular case illustrated below, modeled farm operations have been integrated with an ethanol distillery. This configuration enables the avoidance of fossil fuel usage that would otherwise be required to provide process heat to the distillery. Further fossil fuel usage is avoided by using the wet distiller grains produced by the distillery as feed rations at the farm (also known as a concentrated animal feeding operation – CAFO), instead of the business-as-usual practice of burning fossil fuels to produce heat for drying the distiller grains.

Our findings can be summarized in the bar graph shown below. Emissions are measured in units of metric tons per year of carbon dioxide-equivalent per head (tCO$_2$/hd-yr).
Bion Carbon Offset Potential

The baseline bars show the amount of GHG emissions (also known as carbon emissions) from a typical CAFO, where livestock manure is managed using an anaerobic lagoon and land-spreading of stored manure liquids and solids. Depending on the amount of manure volatile solids produced by the herd being modeled and the specific value assumed for the methane conversion factor (MCF), predicted baseline carbon emissions vary widely. The 6.2 tCO₂e/hd-yr depicted in the graph is considered a typical CAFO baseline situation, representative of current practice at many large-scale dairy operations. A particular CAFO baseline analysis could quantify substantially lower or appreciably greater carbon emissions, depending on the specifics of the animal production facility being modeled (baseline emissions usually fall in the range of 4.5 to 8.7 tCO₂e/hd-yr).

The Bion bars show the full life cycle of carbon emissions when a Bion system is applied to the typical CAFO base case situation. The Bion application consists of coarse solids removal, waste treatment in a bioreactor, fine solids removal, and irrigation of cropped acreage with lagoon effluent such that there are minimal methane emissions from the lagoon. Depending on the amount of volatile solids in the manure, the specific value assumed for MCF, and whether or not separated solids are used for energy production, predicted emissions reductions attributable to the Bion system vary widely. When Bion technology is applied to the typical CAFO baseline illustrated in the graph, estimated on-farm emissions are reduced to 0.62 tCO₂e/hd-yr. If the separated solids substitute for fossil fuel in an energy production process at an integrated CAFO/ethanol distillery, as illustrated in the graph, net carbon emissions attributable to this Bion example are further reduced below zero (to -0.6 tCO₂e/hd-yr). A particular Bion project analysis could
quantify substantially lower or higher carbon emissions, depending on the specifics of the project being modeled.

As depicted in the graph, use of the Bion technology at the illustrated typical CAFO, use of all separated solids as replacement fuel (substituting for natural gas), and use by the CAFO of the wet distiller grains produced by an integrated ethanol plant, would result in a net emissions reduction of approximately 6.8 tCO₂e/hd-yr, relative to the comprehensive baseline. Even if separated solids are not used as fuel; even if wet distiller grains are not supplied to the CAFO, the Bion system would still produce net emissions reductions. These carbon offsets could be used as credits in a carbon-trading program.

Thus, a 10,000-head CAFO with a Bion installation would generate approximately 68,000 metric tons/year of carbon offsets, if the project particulars are consistent with the example illustrated here. Based upon our assessment, it appears that the Bion technology is capable of producing substantial carbon emissions reductions from CAFOs.

Please do not hesitate to contact us should you have any questions.

Sincerely,

Evan A. Evans, P.E.
Vice President and Director of Consulting Engineering
About Econergy:
Econergy has extensive experience working within the Clean Development Mechanism (CDM) of the Kyoto Protocol. Econergy’s up-to-date knowledge and understanding of the carbon market is critical in its ability to act as a world-leading resource for entities concerned about their carbon emissions.

Econergy prepares all required documentation to prepare a project for the CDM and manages the validation and registration process. Most importantly, owing to its relationship with key institutions, Econergy can identify buyers and negotiate emission reductions purchase agreements on behalf of its clients.

Econergy developed the world’s first methodology to be submitted to the governing body of the CDM. Econergy has already provided advisory services for more than 40 projects in several Latin American countries, 28 of which are now registered.

Econergy is actively participating in the political and regulatory debate over post-2012 Kyoto and US carbon markets and is considered a focal point for accurate and punctual information on Carbon Credit market prices and trends. Econergy’s market analysts ensure that our clients’ carbon transactions reflect current prices and prevailing contractual terms with reliable buyers.