



Technology/Service: Integrated anaerobic digestion & livestock waste treatment

Information by: Dominic Bassani

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COMPANY INFORMATION

Company Name: Bion Environmental Technologies, Inc

Phone: 631-499-4930

Web Site: www.biontech.com

Address: P.O. Box 323

State: New York

City: Old Bethpage

Zip Code: 11804

TECHNICAL CONTACT

Name: Dominic Bassani

Phone: 631-499-4930

Email: dbassani@biontech.com

Address: P.O. Box 323

City: Old Bethpage

State: New York

Zip Code: 11804

DEMONSTRATION SITE CONTACT

Site Name: Kreider Farms

Contact: Steve Pagano

Title: Chief Engineer

Phone: 919-631-2853

Email: spagano1@nc.rr.com

Address: 525 Indian Village Road

City: Manheim

State: Pennsylvania

Zip Code: 17545

INITIAL TECHNOLOGY OVERVIEW

This information is to guide in the development of a more specific and detailed Technology Information Request. Please answer the following questions for each Technology or Service provided.

What is the name of the technology or service you provide?

Integrated anaerobic digestion and livestock waste treatment

Describe how this technology is used in a larger Nutrient Management System. Please be as detailed as possible.

Bion's technology is designed to treat anaerobically digested livestock waste from animals where they are housed. Bion's proprietary technology processes the digestate and divert the waste stream assets into commercially equivalent by-products.

How many systems do you have installed on dairy farms or other livestock operations?

	Number of Sites	Size of Installations
Dairy	6	1st generation through 3rd generation systems
Pork	4	
Poultry	0	

Do you have a preferred region or area for the location of projects?

No

Location of farm(s)?

varied

What's the smallest and largest farm using your system?

The third generation technology is designed to be cost effective on producer facilities generating 250,000 gallons per day of waste manure.

Input and output of your unit/system – do you have a mass balance analysis?

If a mass balance is available, please attach or include as a separate document.

Input is raw manure. Output is biogas and commerrical fertilizer products.

Bion's system at Kreider Farnms was intalled based upon an approved verification plan from the state of Pennsylvania wich allowed Bion to generattec tcredits which were approved for use as a qualified Chesapeake Bay TMDL offset.

Input material description/characteristics:

For example: raw manure, digestate, screened digestate, suitable non-farm feedstocks, other.

The input to Bion's technology is raw manure and compatible non farm feedstocks.

Does the technology treat the full manure stream for a farm or a fraction of the stream?

Whatever portion of the manure stream is readily collectible from the housed facilities

Do you consider this a mature system or ongoing farm development?

The Bion's core technology related to ammonia capture and treatment has been in use for over 20 years and is being constantly upgraded. The latest third generation technology has been a significantly upgrade in terms of cost, efficiency, and quality of byproducts.

Any weather constraints? Yes No *Please describe.*

Regular constraints associated with use of an AD in very cold climates.

Any bedding constraints? Yes No *Please describe.*

No sand bedding, biomass bedding is fine.

Output materials description and characteristics:

Please include the % of the total stream for each material, i.e. 10% fiber and 90% screened liquid by weight.

Nitrogen in multiple forms.
Minerals and salts in solid form.
Gray water that can be upgraded for other uses.

Do the Outputs of the process have a resale market identified? Yes No

If so under what brand name or who is the contract with?

There has been no effort to date to initiate a brand name or distribution agreement

Is this process scalable and to what extent (top and bottom limits)? *Please describe.*

The Bion system has been designed for large scale CAFO's of 250,000 gallons per day or greater of manure flow. The system will work on smaller farms, cost effectiveness is more challenging.

Do you have a known scaling factor? *Please describe.*

250,000 gallons perday

Does this technology require any air input? Yes No

What is the preferred air connection? *For example: psi, fitting size, air quality.
If not distributed by the system please list each connected device.*

Does this technology require any water input? Yes No *If so, please describe.*

What is the preferred water connection? *For example: psi, fitting size, water quality, gpm.
If not distributed by the system please list each connected device.*

Does this technology require any electrical input? Yes No *If so, please describe.*

Electricity is required for system operations. Each installation is designed in a site specific manner in concert with the host farmer and local utility.

What is the preferred electrical connection? *For example: phase #, voltage, full load amps.
If not distributed by the system, please list each connected device.*

Does this technology require any mechanical input? Yes No *If so, please describe.*

Bion designs each installation independently, the technology is not a widget that is sold over the counter. Electrical, mechanical, and plumbing design and operational issues are resolved given the uniqueness of each installation.

What is the preferred mechanical connection? *For example: horsepower, connection, rpms.
If not distributed by the system please list each connected device.*

Does this technology require any special plumbing? Yes No *Please describe what is required.*

Does this system require and special foundations or pads? Yes No *If so, please describe.*

Do you consider this technology part of a larger system that you provide? Yes No *If so, please describe.*

Does your system require any other components that you do not provide or are not included in your proposal?

Yes No *If so, please describe.*

How is the system delivered to the site? *For example: skid mounted, assembled on site, constructed on site.*

Some constructed on site, others skid mounted and assembled on site

Is this system portable or configured in such a way that it could be easily transported for use in several locations?

Yes No *Please describe.*

Has your technology been accepted by the NRCS and is it included into a practice standard? Yes No

Describe if necessary.

Previous versions of our technology have been accepted into NRCS Conservation Practice Standard 629

Are there any unusable or hazardous byproducts of this process? Yes No

If so, please describe the product and recommended means of disposal.

What spare parts and redundant components are included with the system?

To date, Bion operates its own systems, therefore spare parts and redundant components are a part of our operational planning. These are clearly critical issues to successful operations.

How is the system controlled and what are the components and capabilities of the control system?

The system is controlled through a programmable SCADA system, accessible both at the farm and through a secure ethernet connection for remote access.

What is the usable life of the system?

At Least 20 years.

What is the salvage value at the end of the usable life?

Varies, to date Bion finances these system, and works out operational cost responsibilities with the host farm.

What is the educational and technical level of competence for the operation of the system?

Farm trained workers can operate our systems.

What level of maintenance is required for the system?

Please indicate if rebuilds or major components must be replaced and what the frequency is for these components.

Maintenance is frequent and important, just like any other manure treatment system. Bion's SCADA system helps with this, as do onsite operators.

Are consumables used in the process? Yes No

Please provide the nature and purchase relationship for these consumables. For example: proprietary, special contract, generally available.

Bion uses a variety of consumables from time to time, but since the host farm isn't responsible, it is our issue to deal with and not the farmers.

Which of these NRCS codes would your technology be classified under? Check all that apply. Add if necessary.

CODE	NRCS DESCRIPTION	APPLIES
472	Access Control	
560	Access Road	
309	Agrichemical Handling	✓
371	Air Filtration and Scrubbing	
591	Amendments for the Treatment of Agricultural Waste	
366	Anaerobic Digester	✓
672	Building Envelope Improvement	
372	Combustion System Improvement	
317	Composting Facility	
554	Drainage Water Management	
375	Dust Control from Animal Activity on Open Lot Surfaces	
373	Dust Control on Unpaved Roads and Surfaces	
374	Farmstead Energy Improvement	
512	Forage and Biomass Planting	
561	Heavy Use Area Protection	
516	Livestock Pipeline	
590	Nutrient Management	✓
521A	Pond Sealing or Lining, Flexible Membrane	
533	Pumping Plant	
558	Roof Runoff Structure	
367	Roofs and Covers	
318	Short-Term Storage of Animal Waste and By-Products	
570	Stormwater Runoff Control	
606	Subsurface Drain	
635	Vegetated Treatment Area	
601	Vegetative Barrier	
360	Waste Facility Closure	
632	Waste Separation Facility	✓
313	Waste Storage Facility	✓
634	Waste Transfer	
629	Waste Treatment	✓
359	Waste Treatment Lagoon	

Can you provide an estimate of the capital required for the installation of this technology?

Please include all components and designate if provided by you or others.

Not in a generic sense, it is a site specific number with many variables.

Can you provide an estimate of the operational costs required for this technology?

Please include all costs and designate if provided by you or others.

Energy costs are tied directly to the level of by-product processing, such as % dry matter in the solids. Maintenance of the system is minimal. Labor is skilled farm level labor with outside specialty assistance.

Is there financing available for this system? Yes No *If so, what are the conditions for this financing?*

Bion finances and owns these systems

Is the system available for lease? Yes No *Please describe.*

What sort of warranty or guarantee do you provide with this technology?

Do you provide any performance guarantees or strictly defects in parts and materials?

Performance Guarantees are associated with nutrient capture rates and environmental outcomes. The systems are installed under long term (20 year) agreements.

Explain how this system is unique or transformative and how does it improve upon or go beyond other technologies that are currently available.

The combination of the business model and technology is unique in that it enables Bion to provide a utility relationship to the CAFO producer at a cost that is affordable. The long term performance risks are held by Bion.

Would you be willing to provide a location for a site visit by Newtrient? Yes No

If so, please provide location.

Manheim, PA installation

Technology References. Please provide customers with whom we can discuss this technology and its performance.
Include a company name, location, contact name and contact information.

Reference 1

Company Name:	Bion
Company Location:	
Contact Name:	Steve Pagano
Contact Information:	upon request

Reference 2

Company Name:	
Company Location:	
Contact Name:	
Contact Information:	

Reference 3

Company Name:	
Company Location:	
Contact Name:	
Contact Information:	

Reference 4

Company Name:	
Company Location:	
Contact Name:	
Contact Information:	

Are there any other facts about this technology that you feel should be included in this document?

Bion's technology utilizes a utility type business model. Bion maintains the financing and technology risk, the host farm simply pays for services on the basis of a long term agreement.