



Farm Pilot Project Coordination, Inc.
"Technologies for Nutrient Management"

January 15th, 2009

To: Mr. William Boyd - Leader, Manure Management Team
East National Technical Support Center - NRCS

From: Bob Monley, General Manager, FPPC, Inc.
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Preston Burnette, FPPC Mechanical Engineer
Christopher Tubbs, FPPC Site Project Manager

Re: Quarterly Report for period from October 1st through December 31st, 2008

This report is intended to update the NRCS and the FPPC Board of Directors on the status of the innovative technology pilot projects.

Executive Summary

During the fourth quarter of 2008, FPPC initiated its first waste-to-energy project targeting production of dual-use pellets derived from dairy solids. In addition a proposal has been written and submitted to the State of Florida for bio-energy funding consideration at multiple Florida dairy farms. In December, FPPC participated in a one day workshop in Orlando hosted by the Florida Renewable Energy Producers Association. This workshop overviewed upcoming grant, loan and financing opportunities available to farm owners and industry producers.

Staffing has been increased at FPPC allowing a more proactive role at existing and new project sites. At existing sites engineering, field and management personnel are being encouraged to lead critical debugging efforts. Going forward, FPPC will assume responsibility for project management and assuring that complete solutions generate an acceptable economic return.

OPERATIONS -----

A. Location change: FPPC moved its operating personnel from downtown Tampa to a new location 21 miles away in Pinellas County, Florida. The new location took advantage of available and unused space at the Young-Rainey STAR Center and is located at the corner of Belcher and Bryan Dairy Roads. All contact information, phones, email and mailing address are unchanged. The office at the Young-Rainey STAR Center will also support the expanded project management facilities and team.

Our new personnel include:

- Mr. Ted Key – Manager, Product and Strategic Planning
- Mr. Chris Tubbs – Field Site Coordinator/project manager
- Mr. Preston Burnette – Chief Engineer
- Mrs. Tammy Jahn – Operation Associate

B. Energy conversion projects: During the 4th quarter, the Board of Directors met twice. The Board was presented a project to capture solids and convert it into dual-use pellets for either fertilizer or energy use. An agreement was reached with AWS, LLC, to provide assistance as needed based on the previous favorable experience with the earlier belt press separators in Vermont and New York. As previously noted, FPPC is now self-directing all projects. In this case FPPC will project manage the effort on up to three sites where waste stream variability can be addressed.

Several thermal conversion projects were considered this quarter. In order to further evaluate, FPPC has initiated an energy audit program. This effort will be self-directed and allow our staff to assess how well the energy use matches farm needs. A fully defined thermal project solution is anticipated for Board consideration by the end of the second quarter, 2009.

Consideration of “liquid fuel” projects has been deferred. Based on assessments of complexity and scaling factors, technologies reviewed thus far are still in the experimental stages and cost prohibitive. However, in the past month FPPC has been contacted to consider four (4) different methods of biodiesel production. Monitoring in this area will continue.

C. Unsolicited proposals: To better focus ongoing FPPC interests and opportunities a policy for unsolicited proposals was adopted. FPPC will post a Broad Area Announcement (BAA) focused on technologies needed to support our current and planned self-directed projects.

D. Advisory Board: The Board of Directors has approved the formation of an Advisory Board of outstanding professionals and industry experts to assist its management in maximizing the benefit of geographic and technical experience. Invitations to prospective have been sent. Director, Larry Clark will serve as the Chairman of this non-decision making advisory group. The first meeting of the PAB is likely to be held in the second quarter of this calendar year.

E. FREPA – Florida Renewable Energy Producers: In December, FPPC representatives attended a one day waste-to-energy workshop in Orlando, Florida. The agenda provided insight into USDA and EPA programs. The changes imposed by the investment community and risk-adverse financial markets were discussed in detail.

F. Site Energy Audits: FPPC is working with EnSave to conduct energy audits at five (5) CAFO sites. These audits will assist FPPC and the farm owners in developing baseline information and a quantifiable understanding of farm needs and an appropriate match for potential manure-to-energy systems.

G. 2009 Technology Summit: FPPC has begun planning its 5th Annual Technology Summit. A new target date for early autumn is being considered.

A. Progress at active pilot demonstration sites is summarized below:

**Poultry, Virginia (#4.06)-----
Virginia Polytechnic Institute and State University
Heatwole Poultry Farm**

Process Description:

- Pyrolysis conversion of poultry litter to bio-fuel for on-site use
- Unit employs a fluidized bed and modern controls to operate the system

Project Status:

During the month of November, FPPC conducted a site visit to the Heatwole farm. Coincidentally, a field day had been scheduled and was attended by US Congressmen Bob Goodlatte and Ms. Kristen Hughes from the Chesapeake Bay Foundation. The event was also attended by prominent members of the Virginia Tech community. Virginia Tech has retrofitted the pyrolysis unit with wheels and is able to transport the unit to alternate sites. Although the machine was not currently running, FPPC was able to see evidence of the char previously produced. Virginia Tech's principal investigator, Dr. Foster Agblevor reported that the char is nutrient rich and is being considered for a slow release fertilizer.

Initial reports show the process output of chicken litter is composed mixed products i.e. 20% char, 40% bio-oil, and 40% syngas. The currently pyrolysis system/configuration starts production with natural gas and the syngas generated becomes the fuel needed to continue operation.



The unit is supported on a platform with wheels
November 2008



Observers at the field day in

**Dairy, Pennsylvania (#5.07) -----
Nutrient Control Systems, Integrity
Mercer Vu Farms in Mercersburg, Pennsylvania**

Process description:

- Upgrading and enhancing the existing nutrient management system, making waste treatment of manure user friendly and cost effective.
- Capability for fine sand removal, additional solids separation capability, conveyor, blower & controls, building expansion, windrow turner and curing pad sufficient to support a viable composting operation.

Project Status:

FPPC field staff conducted a site visit to the Mercer Vu facility in October. The technology provider has installed and is currently testing a cyclone separator to assist in the removal of sand. FPPC staff was able to observe substantial differences in sand capture.

A blender has been installed to mix the sludge from the Kemira system with the sludge solids from the screw press. This is proving to be beneficial in the composting process. At the time of the site visit, FPPC was able to view the windrow composting project on site.

The project is estimated for completion by the third quarter of 2009.



FPPC Chris Tubbs & equipment representative, Kyle Rife



Mercer Vu's composting facility

Dairy, Texas (#4.16)-----
Reaction Energy Corp.
Fisher Dairy, Yantis, Texas

Process description:

- Limited resource farm technology
- Development of struvite formation on a limited resource farm.
- Initial testing will provide a performance milestone for continuing the project.

Project Status:

During the fourth quarter the technology provider conducted the x-ray diffraction (XRD) and energy dispersive x-ray fluorescence analysis (EDXRF) to determine the chemistry of the precipitate being retrieved from the tanks. After the review of the results, FPPC has approved continuation of Phase 2 of the project in order to perform added operational testing of struvite formation.

Dairy, Florida (#5.09 & #5.09a)-----
White Technologies Inc.
U.S. Environmental Products, Inc.
North Florida Holstein, Bell, Florida

Process description:

- Installation and development of solids removal capability via vacuum dewatering bed augmented by polymer additions
- Project 5.09a provides for on-site effort to optimize polymer addition and to debug current dewatering bed process

Project Status:

During the fourth quarter - FPPC has assumed project management responsibility with emphasis on polymer testing. The current filter plates are not functioning as expected. At present, a systematic problem solving method is under way in order to identify the problems and to determine what degree and type of polymer addition affected the vacuum dewatering bed functioning.



FPPC's on site laboratory at North Florida Holstein's dairy to conduct the polymer evaluation

Dairy, Florida (#4.12)-----
AWS, LLC and FPPC
Dual purpose pellets derived from dairy solids

Process description:

- FPPC will work with AWS, LLC to develop a mobile pellet plant leveraging the knowledge gained during the previous belt press demonstrations.
- The system will consist of a belt press, pelletizer, and fluidized bed dryer.

Project Status:

Agreements between FPPC and AWS have been executed and initial project efforts are underway. Ted Key is the FPPC project manager and will provide oversight for AWS and other third party vendors.

Swine, Hawaii (#6.13)-----
University of Hawaii
Janong Natural Farms, Kurtistown, Hawaii

Process description:

- Pigs will be housed on green litter for limited resource farm applications
- Liquids will be absorbed by green waste material
- Project will identify the primary indigenous microorganisms
- Economic analysis of construction and design of a solar and naturally ventilated facility in Hawaii.

Project Status:

Progress during November and December was slow due to the amount of rainfall in the region. The piggery is making progress, including the completion of the concrete work and roofing. The collection of the microbes has started with EM Laboratories and start up is anticipated for February 2009.

Dairy, Virginia (#4.15)-----
Virginia Dairymen's Association
D&D Dairy, Dayton, Virginia

Process description:

- Limited resource farm technology
- Demonstrate and evaluate a high-efficiency screw press to remove solids.
- In conjunction with a struvite precipitation system to remove Phosphorus from the liquid stream

Project Status:

During the fourth quarter, FPPC conducted a site visit. The principal investigator from Virginia Tech has determined that the presence of lime in the bedding material is causing challenges in the separation process. FPPC is working with the farm owner to address mastitic issues.



Solids collected from screw press operation

Swine, Iowa (#4.03)-----
Puck Custom Enterprises (PCE)
Muhlbauer Farm
Greenflash II Farm
Langle Farm

Project Description:

This project will develop and study geotextile as a means of collecting and dewatering and employs high pressure and rapid filling methods with metal salt/polymer flocculation. Comparative testing and evaluation is now being planned for three (3) separate swine sites in Iowa.

Project Status:

Due to flood and winter conditions and current retooling efforts, plans to conduct the fill at the Muhlbauer Farm have been delayed and rescheduled the end of the first quarter 2009.

Swine, North Carolina (#4.14)-----
North Carolina A&T
University Farm, Greensboro, North Carolina

Process description:

- Process will incorporate solid separation, effluent treatment and wetland conservation.
- Designed for a limited resource farm.

Project Status:

During the fourth quarter, agreements have been executed and project start up is anticipated in early 2009

Poultry, Wisconsin (#5.04) -----
R&J Partnership
Creekwood Farms, near Madison
Weiss Poultry Farm in Kewaskum, Wisconsin

Process description:

- Utilizes chicken manure and mortality carcasses, along with a carbon source for conversion into a stable, organic fertilizer derived from laying hen facility.
- A bio-filter acts as a scrubbing mechanism to take out noxious odors associated with composting process.
- A key element in the process is the ammonia capture and the re-introduction of Nitroten into the final composting process.
- Leachate is collected in tanks and is re-used during the process. The net effect is that the process is optimized so that Nitrogen values remain elevated.

Project Status:

In November, FPPC staff conducted a site visit to observe the progress of the project. Currently the project remains behind schedule and some minor changes were observed. FPPC will assume direct project management as set a new schedule for completion.

Swine and Dairy, Michigan (#6.06)-----
Phase 3 Developments & Investments, LLC
Geerlings Hillside Farm

Process Description:

- Treatment of mixed animal waste from both swine and dairy.
- A series of waste treatment technologies (i.e. screw press and dissolved air flotation) have been integrated with an anaerobic digester to provide a complete system.
- Ultimately producing electrical power may be incorporated at a later date.
- Pelletization and transport of nutrients off site to organic fruit farms and other potential end users.

Project Status:

FPPC conducted an energy audit at Geerling Hillside Farm during the fourth quarter. The energy audit will assist in quantifying energy consumed by the farm in contrast to energy being made available from the manure-to-energy projects.

Phase 3 Development is in its final stages of the project and is currently writing their final report

Dairy, Ohio (#4.07)-----
Crossroads RC&D / Wastewater Services, Inc.
Andreas Farm, Royer Farm

Process description:

- Microbial enhancement.
- Flushed and dry scrape dairy sites.
- Dewatering and complete solid separation.
- Package plant to treat effluent.
- Able to achieve nutrient and water quality levels acceptable for discharge.

Project Status:

The pilot project continues to lag behind schedule and is paced by solid separation performance. In October, the Board of Directors approved FPPC's proposed recovery plan to either take on direct project management or curtail the project. Site visits were conducted that included meetings with farm owners and technology vendors.

A change of scope to allow different separation methods is currently underway at both the Andreas Farm and Royer Farm. Each farm will submit modified plans for review. After which, FPPC will determine whether to assume management of the projects or terminate them.

Dairy/Mixed Waste, California (#5.06)-----
Agricultural Waste Solutions, Inc.
Inland Empire Municipal Site, Chino

Process description:

This project utilizes a regional model and a centralized location at the Inland Empire Utilities Agency site in Chino, California. Key elements of the pilot demonstration include the AWS centrifuge and gasification unit. The one-year testing program will test dairy, swine, beef, poultry, horse, digested sludge, food waste and mixes of wastes for their produced energy value. The demonstrations and tests will simulate a large range of farm waste systems, from high-volume flushes to dry-lot manure systems, in order to evaluate energy production, efficiency, costs, automation and maintainability. The

improved centrifuge will remove moisture and is designed to uniformly condition the feed stock entering the gasifier.

The system consists of a skid-mounted centrifuge, a skid-mounted gasifier, an intermediate solids hopper, and augers from the centrifuge to the hopper as well as from the hopper to the gasifier. The unique centrifuge removes 98% of the suspended solids with 70% moisture. It is designed to uniformly condition the feedstock entering the gasifier.

Project Status:

The project is completed and the technology provider has prepared a draft final report. This report will be reviewed and made available in the first quarter.

Swine, Illinois (#4.09)-----
Envirowaste Technology, Inc.
Rensing Family Farms, Inc.

Project Description:

- Low pressure/multiple filling of geo-textile bags to dewater solids from the first stage of a three-stage lagoon system. This farm houses a 2000-head finishing unit in Illinois.
- The effectiveness of this separation method will be compared to manure derived from the storage pit and manure pumped from storage pond

Project Status:

The pilot project is complete and the technology provider has drafted a final report. The report is being reviewed and made available in the first quarter.

Swine, North Carolina (#4.05) -----
Super Soil Systems
Goshen Ridge Farms in North Carolina

Process description:

- This 2nd generation technology system proposed a “mobile” solid separation capability

Project Status: FPPC and Super Soil continue to work together to review outstanding invoices associated with this project. Efforts are also underway to recover equipment, data and other information needed for final evaluation. A final report has been requested and will be a condition precedent to any further remittance of funds.

Attachment A

Final report status of twenty completed pilot demonstration projects is listed below:

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- A. Swine, North Carolina -----**
Super Soil Systems, USA (#3.09)
Goshen Ridge Farms, LLC - in Clinton, NC
“Solids Removal System to Reduce Environmental Impact of Swine Production”
Report Status: The final report has been reviewed, issued and posted on the FPPC website.
- B. Swine, North Carolina -----**
Air Diffusion Systems (#3.02)
Cavanaugh Farm No. 1 - swine farm in Wallace, NC
“Advanced Microbial Treatment System (AMTS) at Cavanaugh Farm No. 1”
Report Status: The final report has been reviewed, issued and posted on the FPPC website
- C. Swine, Iowa -----**
Global Resource Recovery Organization (GRRO) (#3.05)
Burt Farm & Livestock Co. - swine farm in Marshalltown, IA
“Pork Nutrient Management Demonstration”
Report Status: The final report has been reviewed, issued and is posted on the FPPC website.
- D. Dairy, Florida -----**
Royal Consulting Services, Inc. (#3.08)
Posey Dairy in Lake Placid, FL
“Florida Dairy Nutrient Management Demonstration”
Report Status: The final report has been reviewed, issued and is posted on the FPPC website.
- E. Poultry, North Carolina -----**
McGill Environmental Systems (#3.06)
Farms in Sampson County, NC
“Nutrient Management Technology for Animal Feeding Operations”
Report Status: The final report has been reviewed, issued and is posted on the FPPC website.
- F. Poultry, North Carolina -----**
Cape Fear Resource Conservation (#3.03)
Central Processing Facility in Duplin County
“Demonstration Optimum Fertilizer of Ash from the BEST Solution for Swine and Poultry Manure Management”
Report Status: The final report has been reviewed, issued and posted on the FPPC website.
- G. Poultry, North Carolina -----**
Mountain Organic Materials (MOM) (#3.10)
Randy Johnson and David Parsons Farms, Wilkesboro, NC
“Demonstration of Poultry Manure and Mortality Forced Aeration Composting Bin Systems”
Report Status: The final report has been reviewed, issued and posted on the FPPC website.
- H. Poultry, Alabama-----**
Renewable Oil, Inc. (ROI) (#3.07)
Mills Poultry Farm in Russellville, AL
“Demonstrating BioOil Technology for Poultry Litter Nutrient Management”
Report Status: The final report has been reviewed, issued and posted on the FPPC website.

- I. Poultry, Texas -----
RMG Strategies, Ltd and Microganics (#3.11)
Jacobs Ranch in Carmine, TX
Report Status: The final report has been reviewed, issued and posted on the FPPC website.
- J. Dairy, Florida -----
AJT/Agrimond (#3.01)
Watson Dairy in Trenton, FL
Report Status: The final report has been reviewed, issued and posted on the FPPC website.
- K. Dairy, Wisconsin -----
Skill Associates – Phase I & II(#5.08)
Weise Farms in Greenleaf, WI
Report Status: The final report is currently under review.
- L. Dairy, Florida -----
Royal Consulting, Inc. (#4.01)
Butler Oaks in Lorida, Florida
Report Status: The final report has been reviewed, issued and posted on the FPPC website.
- M. Dairy, Florida -----
QED Occtech (#4.02)
Branford–DPS Dairy in High Springs, Florida
Report Status: The final report is currently under review to be re-posted on the FPPC website.
- N. Dairy, Florida -----
Chemical Lime Co. (#3.04)
Aprile Dairy in Riverview, Florida
Report Status: The final report has been reviewed, issued and posted on the FPPC website.
- O. Swine, Iowa -----
Global Resource Recovery Organization, Inc. (#3.13)
Mobile Deployment System, Eldora, Iowa
Report Status: The final report has been reviewed, issued and posted on the FPPC website.
- P. Dairy, Colorado -----
Applied Chemical Magnesias Corp. (ACM) (#3.12)
Bella Holsteins, Inc. in Platteville, Colorado
Report Status: The final report has been issued, reviewed, and posted on the FPPC website.
- Q. Dairy, Utah -----
Utah State University (#5.4.04)
Blaine Wade Dairy near Ogden, Utah
Report Status: A final report has been issued, reviewed, and will be posted on the FPPC website.
- R. Dairy, Vermont -----
AWS, LLC (#6.02)
North Williston Cattle Company (Whitcomb Farm)
Report Status: A final report has been issued, reviewed, and posted on the FPPC website.

S. Dairy, New York -----
AWS, LLC (#5.05)
Noblehurst Farms
Report Status: A final report has been issued, reviewed, and posted on the FPPC website.

T. Dairy, Vermont -----
BioProcess Technologies (#5.02)
North Williston Cattle Co.
Report Status: A final report has been submitted and is currently under review.