



FPPC

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

January 15th, 2008

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

From: Bob Monley, General Manager, FPPC, Inc.
Dr. Robert Carnahan, Managing Director, FPPC, Inc.

Copy: Carolyn Adams, NRCS – Director ENTSC
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Lauren Seigel, FPPC Operations Associate
Dudley Voorhees, FPPC Field Coordinator
Shetal Patel, FPPC Business Development Manager

Re: Quarterly Report for period from October 1st through December 31st, 2007

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

Executive Summary

Since the last quarterly report, FPPC has commissioned start up on three of the five projects approved in the 2007 proposal round. FPPC continues to finalize agreements on the other two projects. In November, a Request For Proposal was issued with a focus on serving the nutrient management needs of the "limited resource" farmer.

All pilot project demonstrations funded in the 02/03 FPPC grant have now been completed and the final grant close out procedure has begun. Review of one remaining final report review is currently outstanding.

FPPC has begun planning and negotiations for the 2008 Technology Summit.

OPERATIONS -----

- A. Board of Directors:** The FPPC Board met in October 2007 to review project status at various sites as well as the release of the next Request for Proposal. The Board was briefed on the due diligence of the Five Rivers Cattle Feeding – BGP gasification project following a site visit and a Tampa meeting in September held between FPPC, Five Rivers, and BGP Inc. The Board approved limited funding for a) the evaluation/development of a smaller scale gasifier features and/or b) the 3rd party testing and monitoring of the system at the Five Rivers site. The Board believed that the proposed energy use of steam flaking to be too specialized and that the planned deployment of three (3) 50T gasification units at Grants County Feeders was scaled too large to be advantageous for most CAFO sites.
- B. White Paper:** FPPC has begun serious consideration of nutrient management systems that are more strongly linked to energy benefits. Recognizing the continued interest in renewable energy and knowing that energy related systems are likely more to be capital intensive, the Board authorized a white paper to explore various pathways to energy and to narrow the field to the most attractive options. The next solicitation from FPPC awaits completion of this January study.
- C. North Carolina Lagoon Treatment Efforts:** FPPC was invited to participate with the new efforts of the North Carolina Swine Advisory Board. Presently the State's Division of Soil and Water Conservation is chartered to administer and oversee the North Carolina newly funded grant program. Richard Salem and Shetal Patel have visited Raleigh to discuss the need and to offer assistance.
- D. Field Day – Unveiling of 25 Ton BGP Gasifier –** In December, FPPC was invited to participate in a field day hosted by BGP, where BGP unveiled their 25 ton gasifier at the North Carolina State University Lake Wheeler Farm in Raleigh, NC. FPPC met with NRCS representatives as well as conducted a productive meeting with Five Rivers and BGP regarding the proposed pilot project at Grant County Feeders in Kansas.
- E. Request for Proposal:** FPPC released a Request for Proposal (RFP) in November of 2007. This RFP effort targeted the limited resource farmer and lower cost nutrient management methods/technologies better suited at a small scale. Proposals are due in January 2008. Thus far – Dr. Reddy from NC A&T has visited to brief FPPC on appropriate concepts.
- F. Updating website:** FPPC continues to work on its webpage and plans to launch a new site in January 2008.
- G. Technology Summit:** FPPC has begun active planning and negotiating for the 2008 Technology Summit. This year we will encourage sharing and promote the benefits of energy derived from the conversion of this waste stream. After researching different possibilities, FPPC has decided to host the Summit in St. Petersburg, Florida. FPPC will pursue virtual tours during the conference as an option for those not able or willing to invest the travel time to a nearby farm demonstration site. Virtual tours will offer Summit participants with a visual record of FPPC demonstration projects.

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

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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:

Initial sampling and testing has begun upstream on the feedstocks and digestate from the digester. During the month of December, the focus was on normalizing the feedstock schedule for the digester resulting in a more representative overall substrate in the digester. Once startup conditions and stabilization are complete, comprehensive testing and the test protocol will begin.

FPPC's General Manager met with the project manager in December to discuss project status and to explore waste to energy decision making and benefits.

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

Project Description:

- Low pressure and 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 and evaluated in light of waste stream differences (ie. – manure derived from the storage pit under the production house and manure pumped from a storage pond).

Project Status:

Envirowaste Technologies conducted its second event in October 2007. The FPPC team installed a weir on the newly launched Geotube. The weir was monitored to determine dewatering performance of the geotextile bag. A total of 484,000 gallons were processed from the first stage of the three-stage lagoon/sprayfield system to the newly launched Geotube and existing "combo" Geotube. Samples were retrieved for analysis. See Figure 1. The next event is scheduled to be in January.

Figure 1

Environmental/Sludge Analysis		ve1023014 10-17 raw		ve1023012			ve0817006				
		Wet	#/Ton	Wet	#/Ton	lbs/Ton Reduced	% Reduced	Wet	#/Ton	lbs/Ton Reduced	% Reduced
TS	Total Solids %	4.47	89.4	0.64	12.7	76.7	86%	0.64	12.7	76.7	86%
TSS	Total Sus. Solids %	2.45	49.0	0.02	0.4	48.6	99%	0.02	0.4	48.6	99%
TVS	Total Vol. Solids %	2.11	42.3	0.17	3.4	38.9	92%	0.15	3.0	39.3	93%
TKN	Total Kjeldahl N %	0.16	3.2	0.09	1.8	1.4	44%	0.12	2.4	0.9	27%
OrgN	Nitrogen-Organic %	0.16	3.2	0.09	1.8	1.4	44%	0.12	2.4	0.9	27%
TP	Total Phos. %	0.58	11.5	0.02	0.4	11.1	96%	0.02	0.3	11.2	97%
P2O5	Phos. Oxide %	1.32	26.4	0.05	1.0	25.4	96%	0.04	0.7	25.7	97%
SO4	Sulfate mg/kg	688.52		659.69				869.50			
	Alkalinity mg/kg	389.87		31.79				29.73			
	pH S.U.	7.43		7.48				7.50			
	E. Coli MPN/g										

Environmental/Sludge Analysis		ve1120004 11-2raw		ve1120002			ve1120003				
		Wet	#/Ton	Wet	#/Ton	lbs/Ton Reduced	% Reduced	Wet	#/Ton	lbs/Ton Reduced	% Reduced
TS	Total Solids %	3.53	70.6	0.76	15.1	55.5	79%	0.64	12.8	57.8	82%
TSS	Total Sus. Solids %	1.92	38.4	0.02	0.5	37.9	99%	0.17	3.4	35.0	91%
TVS	Total Vol. Solids %	1.57	31.5	0.15	3.0	28.5	91%	0.17	3.5	28.0	89%
TKN	Total Kjeldahl N %	0.21	4.2	0.13	2.6	1.7	40%	0.13	2.6	1.6	38%
OrgN	Nitrogen-Organic %	0.21	4.2	0.13	2.6	1.7	40%	0.13	2.6	1.6	38%
TP	Total Phos. %	0.17	3.4	0.03	0.5	2.9	85%	0.01	0.1	3.3	97%
P2O5	Phos. Oxide %	0.39	7.9	0.06	1.1	6.7	85%	0.01	0.3	7.6	97%
SO4	Sulfate mg/kg	391.58		899.84				2007.84			
	Alkalinity mg/kg	7545.00		6136.60				1.99			
	pH S.U.	7.80		8.23				7.81			
	E. Coli MPN/g										



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

Process Description:

- Fluidized bed – pyrolysis conversion of poultry litter to bio-fuel for on-site use

Project Status:

Following a site visit, FPPC and Virginia Tech have finalized all agreements and FPPC sent copies out for signature in December.

The farm owner and Virginia Tech are still waiting for the delivery of the pyrolysis unit from Colorado.

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

Further development and study of a dewatering methods using high pressure filling of geotextile bags and metal salt/polymer flocculation. Testing is now being planned for three (3) swine sites in Iowa.

Project Status:

All agreements have been executed and initial dewatering unit research and optimization has been started by PCE and Agri-Environmental Engineering (AEE). PCE anticipates its first event early 2008.

Dairy, Utah (#4.04)-----**Utah State University, Center for Profitable Uses of Agricultural Byproducts****Blaine Wade Dairy near Ogden, Utah****Process description:**

- This system utilizes an existing induced blanket reactor (IBR) type of anaerobic digester converting organic carbon in the manure to methane and carbon dioxide.
- The (IBR) effluent will be treated by a new electro-coagulation unit.
- Individual contributions of nutrient reduction of the screw press, settling basin and the electro-coagulator units will also be quantified.
- Testing of the Houle 2 stage separator

Project Status:

Testing of the Houle two stage separator continues. Utah State's project manager anticipates a final report by April of 2008.

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

Process description:

- Upgrading the existing nutrient management system, making waste treatment of manure more operationally friendly and cost effective.
- Fine sand removal, added solids separation capability and a conveyor, blower & controls, building expansion, windrow turner and curing pad to support a composting operation.

Project Status:

In October the Vincent screw press was removed to allow for the installation of a more efficient screw press by Integrity. The mechanical installation and start up is anticipated in January 2008.

Dairy, Vermont (#5.02)-----
BioProcess Technologies
North Williston Cattle Co.

Process description:

- The existing system incorporates a solid separator, a digester, composting capability and effluent treatment.
- The proposed project will take the biological effluent treatment to a new level of effectiveness by upgrading pretreatment of fine suspended solids and optimizing organic treatment in the bio-filter towers
- Belt press will be installed as the primary solid separator

Project Status:

The AWS belt system has been installed at the North Williston Cattle Co. BioProcess anticipates start up of the bio-filter towers in mid-February.

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, augers from the centrifuge to the hopper and from the hopper to the gasifier. All equipment sits on a 25 by 35 foot concrete pad, with a gas compressor and storage tank. Utilities are plumbed to the pad, and the gasifier can run on either natural gas or its produced gas from the storage tank.

Project Status:

During the fourth quarter, the AgWaste system processed flushed dairy wastes, dry-corrals dairy wastes, poultry wastes and mixed dairy and poultry wastes. The highest energy gas values (~ 1000 btu/cu.ft.) were obtained from freshly flushed dairy waste separated through the centrifuge.

After the solids are separated from the liquids by the centrifuge, the pre-drier of the gasifier utilizes waste heat from the flue to dry the manure 15-20% further. This additional drying both lowers the parasitic energy required to fully gasify the material and allows for more dry solids to be processed per hour. By reducing the moisture content from ~ 70% to ~ 55%, the pre-drier increases the efficiency of the gasification process by almost 50%.

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 N 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.

This project scales up from last year's smaller prototypic demonstration effort to a farm scale - commercial size operation and will demonstrate stability, uniformity and consistency of higher grade compost for the fertilizer marketplace. It will also address the two common waste streams at layer facilities.

Project Status:

In October, the Board of Directors approved the additional funding to expand air emission testing and monitoring of the system. John Weiss, the project manager, anticipates the sensors to be installed in January 2008.

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

Process description:

- This 2nd generation technology system deploys a “mobile” solid separation capability
- It can be deployed to serve multiple farm sites of different scales; however three 4360 hog production sites are being interconnected to replicate the waste output of one large swine facility and to test the scalability of this concept.
- The project goal is to demonstrate lower overall cost by spreading the capital investment across several sites and with operations significantly different in scale.

Project Status:

In November 2007 Super Soils submitted a revised work scope to FPPC for the pending pilot project. FPPC is currently reviewing the plan of work to determine the best action forward.

Dairy, New York (#5.05) -----
AWS, LLC (formerly Nutracycle LLC)
Noblehurst Dairy Farm

Project description:

This dairy has approximately 1200 milking cows and is located in Linwood, New York. This farm owner has made a sizable investment in digester facilities and waste to energy capability. A belt press will be utilized to remove the bulk of the suspended solids coming from the digester.

Project Status:

Primary testing was completed in December 2007 yielding results that were less than optimal due to the inconsistency of the digester material. FPPC representatives visited the site in December to oversee initial testing. However, due to an early freeze the tests were not able to be documented. The farm owner committed to provide an enclosed and heated building to the project in order to operate during the winter months. Concern over digester anomalies caused AWS to characterize raw and digested streams of manure. It was determined that several batch tests should be completed prior to commencement of the full scale project. AWS has put together six configurations to be tested after the heating component of the building has been installed.

Dairy, Vermont (#6.02) -----
AWS, LLC (formerly Nutracycle LLC)
Belt press application

Project status:

The electrical and mechanical installation at the farm site was completed in December. The belt press was checked by pouring twenty gallons of raw dairy waste manually onto the press.

The press cake came out dry and with properties exactly like the raw dairy waste testing previously in Georgia. Final start-up and commissioning is planned for mid-January.

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:

During October and November, Wastewater Services continued to operate the brush screen separator and pull samples. The project has been significantly delayed due to equipment delivery delays. In December, the Technical Advisory Board met to discuss a pathway forward. The Board gave Wastewater Services the approval to terminate the subcontractor's agreement. The project manager from Wastewater Services has begun to research alternative options for solid separation needed to fulfill project requirements.



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

Process description:

- development of solids removal via vacuum dewatering bed and polymer addition

Status:

During the month of November, White Technologies, Inc. completed the installation of the vacuum dewatering bed tiles and in December the polymer tanks were installed. FPPC and NRCS representatives visited the site in December to observe the progress made. The project manager, Dave Temple, is projecting start up in January, once the control panel and polymer pump have been installed.



Attachment A

Final report status of sixteen 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 Microgenics (#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 has been reviewed, issued and posted on the FPPC website.
- 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 has been reviewed, issued and posted on the FPPC website. Additional testing on current conditions at farm site is being conducted. A report will be issued at a later date.
- 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: During the month of October, FPPC representatives were present in Eldora, IA to observe and assist in the testing and monitoring of the system. All testing was conducted and a final report has been submitted for review.

P. Dairy, Colorado -----

Applied Chemical Magnesias Corp. (ACM) (#3.12)

Bella Holsteins, Inc. in Platteville, Colorado

Report Status: A final report has been issued, reviewed, and posted on the FPPC website.