



FPPC

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

April 1st, 2006

To: Mr. William Boyd - Leader, Animal Waste Utilization Team
East National Technical Support Center - NRCS

From: Bob Monley, General Manager, FPPC Inc.

Copy: Carolyn Adams, NRCS – Director ENTSC
Bruce Newton, NRCS - Director WNTSC
Ron Williams, NRCS – Director CNTSC
Richard Salem, Executive Director & Board Chairman, FPPC Inc.
Robert Zaytoun, FPPC Board Director
Dr. Robert Carnahan, FPPC Board Director
Hilliard Eure, FPPC Board Director
Sara Royer, FPPC Treasurer
Peter Hubbell, Principal - Water Resource Associates
Barry Kintzer, NRCS - HDQ/DC
Frank Bordeaux, Executive Director – N.C. Agricultural Finance Authority
Frank Lancaster, N.C. Agricultural Finance Authority
Lauren Seigel, FPPC Operations Associate
Dudley Voorhees, FPPC Field Coordinator
Susan Mcloud, NRCS – AWUT, ENTSC

Re: Quarterly Report for period from January 1st thru March 31st, 2006

This quarterly 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 report, the FPPC Board of Directors took action to conditionally approve funding for seven (7) new pilot projects from those submitted during the last RFP round. To date, FPPC is pursuing technology in twenty-six (26) separate pilot projects in 14 states. With seven (7) project demonstrations now complete, present efforts are underway to complete site visits and negotiate final agreements with technology providers for the most recently released projects.

A cooperative agreement has been signed between FPPC and the State of Florida, Department of Agriculture and Consumer Services (FDOACS). This agreement establishes a collaborative effort in Florida to work towards development of better nutrient management practices at key agriculture sites within the state. We hope that this undertaking will serve as a model for implementation on a national basis.

OPERATIONS -----

1. FPPC participated in a workshop hosted by the Local Government Commission in Sacramento, California on Wednesday, January 11, 2006 to publicly discuss potential pilot demonstrations and selection of waste water treatment options in the San Joaquin Valley. The current effort in the San Joaquin Valley is a well organized, collaborative, interdisciplinary mission among federal, state and local agencies. They are evaluating various technology solutions and defining the comprehensive regional needs of the valley. A short summary of key observations follows:

- Of the 44 technologies evaluated in a technical paper study thus far, the group concluded that existing performance data does not fully support claims made by technology providers.
- In the absence of the “silver bullet”, it is generally recognized that best approach will combine technologies to provide an integrated system solution.
- In general, dairy farmers are not opposed to contributing their fair share, but do not support investment where technology may not deliver required results
- The regional needs of the valley are somewhat unique (but not entirely). As urban sprawl continues, waste treatment will need to include methods for capturing nutrients and salts which continue to concentrate in the groundwater and impact to air quality (i.e. ammonia, NOX emissions, and ozone in the summer and VOCs in the winter).

Bob Monley and Bill Boyd, of FPPC and NRCS representing our program, reviewed the pilot project initiatives sponsored by FPPC and made presentations describing available funding options during the forum. The proceedings are documented and available on line at the Local Government Commission website:

http://www.lgc.org/events1/past/sjv_dairy_forum06.html

2. The Professional Review Panel met on February 27th and February 28th, 2006 to review and evaluate 22 proposals submitted in the latest RFP round. Project recommended for funding were presented and acted upon by the Board of Directors on March 31, 2006. The Board took action to conditionally approve or reserve funding for the following:

- Swine Farm, Kansas; QED Occtech (#6.2) - \$ 470,000.00
- Dairy Farm, Vermont; Bio Process Technologies (#6.4) - \$ 287,000.00
- Swine Farm, North Carolina; NC State University (#6.7) - \$ 400-500,000.00
- Poultry Farm, Wisconsin; R & J Partnership (#6.8) - \$ 247,000.00
- Dairy Farm, New York; Fluid Management of New England (#6.12) – \$ 225,000.00
- Dairy Farm, California; Agricultural Waste Solutions (#6.19) – \$496,000.00
- Dairy Farm, Pennsylvania; Nutrient Control Systems (#6.20) - \$235,000.00

The next Request for Proposal is currently being formulated and is scheduled to be released in early July 2006.

3. FPPC continues to promote second generation technologies by restructuring certain agreements to be more aligned with a commercialization objective. To date, three technology providers have been selected as “Joint Venture Partners” in the new agreement.

An article in this month's "Florida Specifier" provides additional perspective from GRRO's Loran Balvanz and FPPC's Bob Monley. A copy of which is attached.

4. A congressional briefing was held on March 28th, 2006 in Washington, DC to review status of the farm pilot program. The presentation and interaction with congressional staffers was held in the Agriculture Appropriations Committee Hearing Room. Participation in the briefing provided a helpful exchange of ideas and addressed concerns of particular interests from various regions of the country. Background information and support materials on FPPC's goals and objectives were distributed to those in attendance as well as other offices that have stakeholder interest in our program. The presentation provided at the briefing can be viewed at our website at: www.fppcinc.org
5. The May 10-12, 2006 Technology Summit is closely approaching. Our goal is to continue foregoing relationships and cooperation among farmers, technology providers and government agencies. This year's program has been expanded to include a workshop to help guide those wanting to submit better proposals and a site visit to a nearby pilot demonstration for those who are able to attend.
6. A cooperative agreement between the Department of Agriculture and Consumer Services (DOACS) in Florida and FPPC to foster and promote nutrient reduction, conservation practices and leverage funding for key agricultural projects in Florida, was reached on April 10, 2006. It builds on joint project efforts already underway in the Suwannee River Basin and the Okeechobee watershed of Florida.
7. The FY 2006 cooperative agreement between NRCS and FPPC has been drafted and is being routed for final review along with the budget and plan of work.
8. A commitment has been made by the audit firm of Lewis, Birch and Ricardo LLC to initiate the annual A133 audit by the first week of June.

=====

Progress at existing pilot demonstration sites is summarized below:

=====

Dairy Farm, Utah (#4.4) -----
Utah State University
Center for Profitable Uses of Agricultural Byproducts

The process at Blaine Wade Dairy in Ogden, Utah:

- 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) will be supplemented by a new electro-coagulation unit to concentrate nutrients from the effluent of the IBR.
- Individual contributions of nutrient reduction of the screw press, settling basin and the electro-coagulator units will be quantified.
- The observed treated water exiting from the installed IBR system is nearly odorless.

Project Status:

Good progress is being at Wade dairy with the electro-coagulator and the solid separation process. A new more effective separator has been purchased by the farm owner to replace his existing fan separator. Initial data indicates that the new separator is capturing solids with 50% of the Nitrogen and Phosphorus nutrient load. More complete data will be presented in next month's Technology Summit.

Installation of the electro-coagulation unit is now projected for mid-April following added efforts to negotiate cost and delivery with equipment suppliers. FPPC's field engineer is scheduling a site visit to the dairy to review progress in the next couple of weeks.

Swine Farm, Iowa (#3.13)-----
Global Resource Recovery Organization (GRRO)

The process at Teske-Butler Farm, Hardin County, Iowa includes:

- System will use an efficient scraper system, dry manure transfer to capitalize on low water consumption and frequent processing to minimize manure accumulation and odor
- Pre-Separation Cyclone (liquid removal)
- Modular designed cyclonic drying system (Tempest dryer) on modular mobile platform
- Development of value added/commercial grade product - slow release fertilizer.

Project Status:

The FPPC field engineer conducted a site visit in January to determine equipment status on the first project and to disposition unused hardware that could be applied to the next project.

GRRO has named Craig Mushel, project manager, for the existing project. The new construction site has been selected and will be permitted at a distance to meet Iowa's new regulations.

GRRO continues to receive a high level of outside interest from poultry growers and suppliers who are evaluating cost effectiveness of alternate methods for drying poultry litter. The US Congressman for the project area, The Honorable Tom Latham, personally visited the facilities on April 1, 2006. GRRO is one of the technology vendors selected for FPPC's joint venture commercialization program.

Dairy Farm, Florida (#4.2)-----
QED Occtech

The process at DPS - Branford Dairy, High Springs, Florida includes:

- A system to capture nutrients from the waste stream of the 2050 dairy cows by combining QED's tangential flow separator and chemical treatment.
- The owner, Mr. Dave Sumrall, hopes to expand his herd in the future and must have an effective nutrient management system in order to avoid excess land application of the nutrients.

Project Status:

To date, all agreements between FPPC and QED have been signed and the project is quickly underway. A kick-off meeting between all project players was held the first week of April to update all parties and make sure that the critical path items are clarified and that the system is up and operating by the end of June. Don Gribble will be the single source project manager for the multi-faceted efforts at the Branford site.

Dairy Farm, Colorado (#3.12)-----
Applied Chemical Magnesiums Corp. (ACM)

The process Bella Holstein Dairy in Platteville, Colorado:

- Easily-assembled recovery system that utilizes the reaction capabilities of inexpensive, milled brucitic marble to extract between 75% - 90% of most nutrients
- Uses magnesium source to react with Nitrogen & Phosphorous to form a crystal precipitate.
- Uses mechanical cellulose separator, a series of reaction tanks (sized for the anticipated flow) with simple mechanical (paddle) agitation, and a hydro-cyclone separator and drying screen for the recovery of the precipitate.
- Precipitated crystals and liquid are sent to the drying screen; crystals are separated from the liquid then stored for various farmers to use as a slow release fertilizer. The remaining liquid flows to a lagoon for solids settling.

Project status:

A revised plan of work has been reviewed and forms the basis of a new contractual agreement between Colorado State and ACM. CSU will provide technical assistance on the project.

The FPPC field engineer will conduct a site visit within the next month. The revised scope of work remains within the constraints of the original project budget.

**Poultry Farm, Alabama (#3.7)-----
Renewable Oil Inc., (ROI)**

The process at Mills Poultry Farm in Russellville, Alabama includes:

- Mobile processing plant to burn poultry litter.
- Poultry litter would be removed from houses and burned.
- Pyrolysis process produces nutrient rich ash and vapor that is converted to bio-oil.
- Bio-oil and ash would both be available as marketable products.
- Bio-oil produced is a low-grade fuel for heaters to warm poultry houses.

Project status:

A 40 hour test run of the project was completed in early January, 2006, with the run being monitored by Mississippi State University (MSU). Renewable Oil Inc. (ROI) has begun analyzing results from MSU for the test run, but has not received all final data. The final report for the project is targeted in the next quarter and will be posted in due course.

The Daniel Mills Farm is scheduled to be sold and close in April. ROI will be cleaning and preparing to move the test plant to another nearby farm site.

**Swine Farm, North Carolina (#4.5) -----
Super Soil Systems
Goshen Ridge Farms**

The process at Goshen Ridge Farms in North Carolina includes:

- This technology system deploys a mobile platform for solid separation capable of serving multiple farm sites.
- The goal is to lower overall cost by spreading investment across sites.

Project Status:

Agreements are in place pending execution by the technology vendor. A status conference was held on March 13th to review the previously completed project and to confirm the new scope of work.

Dairy Farm, Florida (#4.1) -----
Royal Consulting Inc.

The process at Butler Oaks in Lorida, Florida includes:

- This dairy project seeks to capture nutrients in a phosphorus rich watershed next to Lake Okeechobee using a vat separator and chemical treatment.
- Solids will be harvested, subsequently introduced into an in-vessel composter and marketed as a peat substitute by South Dade Soil and Water Conservation District.

Project Status:

The farm owner anticipates the free stall barns to be completed and the dairy cows in by the end of the month. During February, system hardware as well as the electrical system were ordered and should be installed by the end of April. The landowner has completed the concrete platform on which the compost unit will reside. Start-up is still targeted for the end of April.

Poultry Farm, Texas (#3.11) -----
RMG Strategies, Ltd and Microorganics

The process at Jacobs Ranch in Carmine, Texas includes:

- The use of “Bio-Regen Animal” product contains “Carboxx” and Bacillus microbes, a natural, supersaturated, highly soluble, high reactivity humic acid (HRHA)
- The ultra-pure formula provides a capacity to capture and absorb a wide array of impurities found in soil or wastewater
- This process will provide a 75% nutrient reduction in the waste water column, concentrating nutrients in the sludge layer while decreasing odor
- Poultry and swine lagoon application have been targeted as pilot projects

Project Status:

The FPPC Board approved the additional funding request to allow the process to stabilize and test data to be captured that would more fully characterize nutrient changes resulting from waste treatment potential at the farm.

Dairy Farm, Florida (#3.1) -----
AJT/Agrimond

The process at Watson Dairy in Trenton, Florida includes:

- Sand/grit removal.
- Solids separation.
- Primary anaerobic treatment and secondary aerobic treatment with enhanced aeration.
- Suspended solids precipitation using polymers.
- Anoxic treatment for denitrification prior to land application.

Project Status:

Despite ongoing daily maintenance issues, the first laboratory test samples have shown very positive treatment results:

<u>Effluent entering system</u>		<u>Effluent exiting system</u>	<u>% Change</u>
BOD	420 Mg/l	42 Mg/l	90
COD	1644 Mg/l	310 Mg/l	81
pH	8.49 units	7.63 units	-
Nitrate-N	0.35 Mg/l	1.72 Mg/l	491
Ammonia-N	52.9 Mg/l	28.1 Mg/l	47
TKN	186 Mg/l	45 Mg/l	76
Potassium	99.02 Mg/l	40.51 Mg/l	59
Total Phosphorus	29.7 Mg/l	10.95 Mg/l	63

FPPC and AJT/Agrimond provide ongoing weekly support and attention but anticipate by the end of April, the system will be stabilized sufficiently to exhibit a continuous positive trend towards nutrient reduction.

Even though, this pilot project has continued to operate despite the extra process burden of foreign object and sand carryover in the waste stream, counter measures have been taken to help offset its impact. A davit and a screen basket have been designed and are now installed at the lift station to facilitate the easy collection of bio and non-biodegradable debris (tags, string etc). The addition of extra plumbing and aeration allows the system to be more tolerant of sand carryover.



Dairy Farm, Florida (#3.4) -----
Chemical Lime

The process at Aprile Dairy in Riverview, Florida includes:

- Use of chemical lime to reduce nitrogen and phosphorous loading in dairy wastewater.
- Screening and sand removal.

- Dewatered effluent treated with lime to precipitate P and N.
- Ammonia captured as ammonium nitrate.
- Treated water recycled as flush water.

Project Status: The previous decision to salvage and remove the remaining pilot demonstration equipment from the Aprile farm site was carried out during the month of February. The scope and funding to conduct the final chemical testing for this Chemical Lime project has been transferred to the QED Occtech project site at Branford Dairy in High Springs, Florida.

Miami Filter Inc., with research facilities in Ft. Pierce, removed the T-Rex separator from the dairy on February 3rd, 2006. Miami Filter intends to make use of the equipment in a non-commercial research setting for the purpose of further developing environmentally friendly ways to handle waste disposal for the agricultural industry. On February 22, 2006, the University of Florida, removed the trailer platform and mounted hardware from the dairy and transferred it to their Pine Acres Research Center, where it will be utilized to augment agricultural activity on site.

=====

The following two pilot projects await completion of due diligence efforts and contract negotiations before release of funding :

=====

Dairy Farm, Texas (#4.6)-----
Coaltec Energy USA
Erath County, Texas

This proposed project will utilize dry scraped dairy manure and a gasification process to transform dairy waste and its nutrients into a useful energy form. The remaining ash will be processed and developed as a phosphorus rich fertilizer or soil amendment.

Project Status:

FPPC continues its due diligence efforts in the Bosque watershed by seeking project support with leaders from this area. A written agreement of intent was drafted for all parties and stakeholders to sign. The purpose of the agreement is to indicate a clear willingness to cooperate and avoid potential legal disputes. As of April 14th, a signed agreement has not been executed.

In the interim, Coaltec, the technology provider, has advised in writing they are withdrawing their pilot project proposal because of continued delays and an inability to continue support at the current level.

Swine Farm, Illinois (#4.3)-----
WorldWide Bio Energy
C&J Boorman Farm, Kinderhook, Illinois

This project will combine a continuous thermo-chemical process (TC) developed by the University of Illinois and an electro coagulation (EC) technology to produce bio-oil and treat nutrients from a swine waste stream.

Project Status:

On January 11th and 12th, FPPC and NRCS made a follow-up visit to St. Louis to meet with Otis Jesse and Don Northcutt from WWBE, Kent Schien from Innoventor, Chris Boorman, swine farm owner, and Les Christensen from the University of Illinois. The purpose of the visit is to review the technology project, assess the strength of the project team implementing the proposed pilot project and review the appropriateness of the proposed swine facility site. Major findings during the visit indicate that:

- Boorman swine farm operation provides an acceptable waste stream and project site for this technology demonstration (9 houses X 1200 animals)
- The combined project team offers a strong combination with skill sets and seasoned players for project implementation. Innoventor will play a key role with

their engineering prototyping background and skunk works experience. They will also provide a project manager and coordinate funding sources for the project.

- A phased approach to pilot project implementation is planned and offers a sound approach. One hog house will be treated and when fully debugged the entire waste stream from the other eight houses will be brought on line. The pull/plug pit under each house will be on a rotation cycle for treatment every 14 days. FPPC made a suggestion not to ignore the effects of surging during treatment and to build on experience of others who are collecting and homogenizing manure to minimize waste variation.
- While on site, it was learned that WWBE had begun experimenting with solid separation capability, flocculent use and a rented electro-coagulation unit.
- A visit to the University of Illinois allowed a demonstration of a small working TCC prototype that utilizes waste introduced in a batch mode. The pilot project efforts will optimize the system by capturing solids for oil conversion and direct effluent waste streams to the electro-coagulator for nutrient removal.

The next steps require development and submittal of a detailed plan of work and firming up the state and local cost share commitments.

Report status of completed pilot demonstration projects are listed below:

=====

Swine Farm, North Carolina -----

Super Soil Systems, USA (#3.9)

Goshen Ridge Farms, LLC - swine farm in Clinton, NC

“Solids Removal System to Reduce Environmental Impact of Swine Production”

Report Status: Demonstration project has been completed and final report submitted but awaiting final data from ARS.

Swine Farm, North Carolina -----

Air Diffusion Systems (#3.2)

Cavanaugh Farm No. 1 - swine farm in Wallace, NC

“Advanced Microbial Treatment System (AMTS) at Cavanaugh Farm No. 1”

Report Status: Demonstration project completed – final report has been reviewed and written comments have been submitted to the technology provider on March 10th.

Swine Farm, Iowa -----

Global Resource Recovery Organization (GRRO) (#3.5)

Burt Farm & Livestock Co. - swine farm in Marshalltown, IA

“Pork Nutrient Management Demonstration”

Report Status: Demonstration project completed and final report has been received. The final report will be revised to reflect the effects of corrosion damage detected during the pilot.

Dairy Farm, Florida -----

Royal Consulting Services, Inc. (#3.8)

Posey Dairy in Lake Placid, FL

“Florida Dairy Nutrient Management Demonstration”

Report Status: The final report - reviewed, issued and is posted on the FPPC website.

Poultry Farm, North Carolina -----

McGill Environmental Systems (#3.6)

Farms in Sampson County, NC

“Nutrient Management Technology for Animal Feeding Operations”

Report Status: The final report - reviewed, issued and is posted on the FPPC website.

Poultry Farm, North Carolina -----

Cape Fear Resource Conservation (#3.3)

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 - reviewed, issued and posted on the FPPC website.

Poultry Farm, 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 - reviewed, issued and posted on the FPPC website.

=====