FPPC

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

January 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
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Lauren Seigel, FPPC Operations Associate
Dudley Voorhees, FPPC Field Coordinator
Susan Mcloud, NRCS – AWUT, ENTSC

Re: Quarterly Update for period from October 1st thru December 31st, 2005

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

To date, FPPC has a total of eighteen (18) pilot projects that have been approved. Out of those eighteen (18), seven (7) projects have been completed and funded effort is underway on the additional eleven (11) demonstration projects. To date, FPPC remains confident of the progress demonstrated on all but two (2) pilot projects but a recovery plan is now in place to explicitly guide those efforts. Several site visits have been conducted to ensure that proper procedures were being followed and that progress was being made.

Since the last report, the FPPC Board of Directors have convened and has taken action on several needed points; including the action to deny requested funding on one project while continuing to reserve funding for another project pending completion of due diligence and review.

Ventures into joint agreements between FPPC and the State of Florida, Department of Agriculture and Consumer Services are being actively pursued to collaboratively fund nutrient reduction projects at key agriculture sites within the state.

Another request for proposal (RFP) was issued in early December with responses due back by February 1st. A continual flow of questions and feedback is being monitored daily.

OPERATIONS ----------

1. During the November 14th FPPC board meeting, all ongoing and proposed projects were reviewed. To inform the Board about proper project close-out of the existing grants, an update will be available at the next meeting regarding the current inventory of equipment at each pilot demonstration site.

2. A site visit to the Moorman sow farm and the University of Georgia field station in Tifton was conducted by Pete Hubbell and Bob Monley. The FPPC Board subsequently, reached a decision not to go forward with the funding of the proposed soldier fly project. During the review, the Board concluded that the proposed project would not be close enough to commercial viability at the completion of the pilot project to merit funding at this time.

3. An effort to compare best practices on pilot projects has been initiated. FPPC Director, Dr. Carnahan will provide guidance for this comparison which will hopefully capture performance data on different process equipment and methodology.

4. The State of Florida, Department of Agriculture and Consumer Services (DOACS), and FPPC have agreed on the language for a cooperative agreement that will promote nutrient reduction, conservation practices and funding for agricultural projects in Florida. Favorable site visits have been made to two proposed dairy project sites in Florida and cost sharing amounts have been agreed to.

5. FPPC has begun considering how best to promote commercialization on second generation technologies by restructuring its agreements to be more aligned with that objective

6. An RFP was issued December 1st, 2005 by FPPC which will be followed by evaluation of received proposals in February with funding recommendations to the Board in March. Significant effort was undertaken to clarify the requirements and to highlight the need for demonstration sites in locations where excess nutrients are documented. Lauren Seigel is handling daily questions and procedural issues with this RFP.

7. In December, a comprehensive benefits package was offered to full time employees of Farm Pilot Project Coordination, Inc.

8. A Congressional briefing is planned for March 28, 2006 in Washington, DC to review status of the farm pilot program.

9. Planning for the upcoming May 10th-12th 2006 Technology Summit has commenced. The goal is to boost attendance by 50%. A site visit to a nearby pilot demonstration site is being considered for those attending.

10. The Local Government Commission in Sacramento, CA will host a workshop on Wednesday, January 11th to publicly discuss potential pilot demonstrations in the San Joaquin Valley. This forum is designed to bring together a diverse group of technology providers, regulators, dairy owners and other stake holders to consider requirements, funding and partnerships for the treatment of dairy manure in the region. Bob Monley and Bill Boyd have been invited to participate.

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Progress at existing pilot demonstration sites is summarized below:

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Applied Chemical Magnesias Corp. (ACM) ---------- Bella Holstein Dairy in Platteville, Colorado

Process:

- 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:

To better understand the performance issues (attributed to unexpectedly high pH of the effluent and the brucitic marble inefficiently accumulating phosphorus in the reaction tanks) a technical review meeting was called in Ft. Collins, CO on November 3rd, 2005 with Dr. Jessica Davis and Addy Elliott from Colorado State University, Bob McCreless - ACM, Pete Hubbell - WRA and Bob Monley - FPPC. Joining by teleconference was Dr. Ron Sheffield from the University of Idaho who has amassed considerable experience with Idaho dairies using a similar treatment constituent in the form of “struvite”.

A revised plan of work has been submitted, reviewed and approved. The plan forward will determine if the pH/chemistry of the effluent at this dairy is unusual and provide enough sampling data within the waste stream to retarget effective chemical treatment at this demonstration site. Due to the previous configuration failing to achieve results, the plan forward incorporates the parametric capability/characterization available thru Dr. Sheffield. The modified plan remains within the dollar constraints of the original project budget.

Renewable Oil Inc., Alabama Operations ----------
Mills Poultry Farm in Russellville, AL
"Demonstrating Bio-oil Technology for Poultry Litter Nutrient Management"

Process:

- Mobile processing plant to burn poultry litter.
- Poultry litter would be removed from houses and burned.
- Pyrolisis 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:

Dudley Voorhees visited the site on October 19th and observed the new condenser system. An extended timetable has been agreed with project completion anticipated by the second quarter of 2006. Minor setbacks initially occurred, but a successful 40 hour run was completed at the beginning of January.

The intended sale of the farm property has still not occurred and the present farm owner remains supportive of continued pilot testing on site.

Utah State University ----------
Center for Profitable Uses of Agricultural Byproducts
Blaine Wade Dairy in Ogden, Utah

Process:

- 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:

Since the last report, biogas from the IBR anaerobic digester continues to be reliably produced from the farm system on a 24 X 7 basis and electrical power that results is being continuously fed into the grid. The milestone for procurement of the electro-coagulation unit in January is in jeopardy as two interested suppliers who previously visited the site have decided not to bid. Other suppliers are now being contacted.

In the interim, site preparation and cement work continues. Effluent samples from the IBR have been taken and will be used to establish the baseline of nutrients before an electro-coagulation process is installed.

Global Resource Recovery Organization (GRRO) ----------
Teske Farm, Hardin County, Iowa

Process:

- 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:

A visit to Eldora, Iowa was made in November to meet the farmer and discuss project details on the next generation equipment. An agreement for $500,000 was signed in Tampa during the Holidays and this project is underway. Dudley Voorhees is scheduled to audit and formally close the first generation project (GRRO I) during the second week of January.

Accounting for equipment that can be reapplied to the next project is an immediate priority. Corrosion and equipment conditions will be fully documented from the first project and will be utilized to incorporate key improvements into the second project

Concerns of pathogens in the manure have be eased due to the recent test results coming back negative for pathogens in the dried manure processed through the cyclone dryer.

Super Soil Systems ----------
Royal Farms in NC

This project seeks to demonstrate Super Soil System's next generation of nutrient management system by deploying a mobile platform for multiple farm site applications and by taking aim at lower cost targets.

Project Status:

The FPPC Board approved $550,000.00 for the new mobile unit, the nutrient testing and monitoring. Agreements have been drafted and sent to Super Soil Systems for review and signature. The next generation mobile unit is available now slightly ahead of farm preparation arrangements.

Royal Consulting Inc. ----------
Butler Oaks, Lorida, Florida

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 alternately harvested and subsequently introduced into an in-vessel composter.

Project Status:

FPPC conducted a site visit to meet the farm owner and to assess the farm site appropriateness for a pilot demonstration. Presently, the Butler family has made a major investment in new free stall barns which are currently being constructed to meet hurricane Category 3 requirements.

This pilot project is now fully funded with a shared commitment from DOACS, who has indicated they will cost share $100,000 at this site. Agreements have been drafted and are ready for signature.

QED Occtech ----------
DPS - Branford Dairy, High Springs, Florida

This dairy project seeks to capture nutrients from the waste stream of the 2050 dairy cows by combining QED's tangential flow separator and chemical treatment. During the recent site visit, Mr. Sumrall expressed his commitment to the future by finding a way of capturing nutrients rather than spreading of nutrients on his land.

Project Status:

The Board originally funded approximately 50% of this project leaving a cost sharing shortfall of $245K, which has now been met with increased project contributions from the owner, QED, DOACS and $50,000 of unused funding from the transfer of the Chemical Lime project.

FPPC and QED are in the final stages of the agreements. Once all agreements have been signed this project will be underway.

RMG Strategies, Ltd and Microganics ----------

Process:

- 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

Jacobs Ranch site #1 ----------
Layer hen facility in Carmine, Texas

Project Status:

The recent but unexpected discovery of an interconnecting pipe between the treated lagoon and the untreated lagoon has provided needed insight into the treatment anomaly and the effectiveness of the current pilot project. The pipe is blocked and proper dosing has been re-initiated at levels commensurate with a revised plan of work.

Dudley Voorhees visited the poultry demonstration site in October and verified that all equipment and system was fully operational.

Based on insufficient test data and because of inadequate and invalid treatment assumptions, a request to extend the project timetable and provide added funding was submitted and reviewed. This would allow stabilization, testing and monitoring during both cold and hot months with the new lagoon configuration. The FPPC Board approved additional funding request and a six month scheduler extension to capture test data and document nutrient changes at the farm.

Proposed Swine Facility ----------
Holmes Complex - Murphy Brown, NC

In addition, FPPC has received a fully detailed proposal from Bob Gray and Microganics for testing at a North Carolina farm site. After review of the proposal and the original commitment to provide limited funding for testing and monitoring at a second site, it was deemed that the project requirements have changed sufficiently enough to impact project scope/cost and procedurally should be reconsidered and evaluated as a new project. Therefore, this proposal will be among those evaluated with the proposals submitted in the current RFP round due the first of February.

AJT/Agrimond ----------
Watson Dairy in Trenton, FL
"Florida Dairy Nutrient Management Demonstration Pilot Project for Watson Dairy"

Process:
- 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:

A difficult decision to fully restore the integrity of the waste stream containment of both the lift station and the primary basin was made. A complete draining and re-cleaning of the primary basin was completed in November 2005. The photograph below shows primary basin fully drained in preparation for system restart.

Continued analysis shows that the system requires daily maintenance and cleanout in order to properly run. Without this needed attention, the system suffers from degradation of sand carryover. A mechanical assist is being considered in an effort to facilitate the awkward removal and the difficult cleaning of screens.

Dudley Voorhees continues weekly trips to the Watson dairy site with Agrimond to monitor progress. By January, adequate polymer should be available to the system and deployed well enough to allow system treatment to operate as planned.

Chemical Lime ----------
Aprile Dairy, Riverview, FL
"Nutrient Removal from Dairy Farm Wastewater Using Lime"

Process:

- 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:

FPPC has responded to Chemical Lime's written request, in light of continued problems at the Riverview site, to consider a transfer to another pilot demonstration site. Scope and cost agreement have now been reached with QED Occtech to transfer and conduct limited testing of the alum/lime combination (originally planned in Riverview) at Branford Dairy and to provide a performance comparison with the ferric sulphate/lime/polymer combination offered in their new pilot project chemical treatment design. This test data will allow the final report to incorporate a meaningful conclusion of the Chemical Lime project. The remaining Chemical Lime project funds will be transferred to QED Occtech to offset increased cost and to complete testing of the existing project.

Regarding salvage of equipment on site, Miami Filter, has indicated their research interest in the T-Rex dewatering unit. They have agreed to sign an agreement incurring all costs to

rework, lift and transport to their site but will also allow research access to University of Florida agricultural students. If at a later time the equipment should be sold, FPPC will share in those proceeds.

Agreements have been drafted and sent to Chemical Lime as well as the owners of Aprile Dairy to reflect the various changes and concluding actions of the project.

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The following proposed projects currently under due diligence and contract negotiations:

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DOACS Proposal ----------
M & B Dairy, LeCantro, Florida

This project was fully funded with cost sharing at the outset, but a subsequent meeting with all parties raised concern about achieving economic benefits and who was to assume project responsibility. Dale McClellan, farm owner, recruited consulting engineer, Michael Holloway, to reformulate the proposal, consider the design and examine the budgetary requirements.

Project Status:

At this point, FPPC and DOACS have a new proposal but must reconcile the new project costs which have grown considerably.

Coaltec Inc. ----------
Texas

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

Project Status:

FPPC has indicated it would fund approximately half of the proposed project, or $412,000, but would require an added cost sharing of $163,000. Coaltec has indicated that approximately 2/3 of the cost share commitment can be met today. FPPC continues its due diligence efforts in the affected watershed by seeking clear alignment with community leaders and support for a successful technology demonstration.

WorldWide Bio Energy ----------
Borrowman Farm, 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:

A follow-up visit to Illinois with Otis Jesse, Kent Schien from Innoventor, Jennifer Ross and Les Christensen from the University of Illinois is planned on January 12th and 13th. The purpose of the visit is to re-examine the pilot project and to evaluate the adequacy of the proposed farm site and the proposed cost sharing.

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Completed pilot demonstration projects are listed below:

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Super Soil Systems, USA ----------
Goshen Ridge Farms, LLC
Swine farm in Clinton, NC
"Solids Removal System to Reduce Environmental Impact of Swine Production"

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Report Status:
Demonstration project completed - final report has been submitted.

Air Diffusion Systems ----------
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 in draft form.

Global Resource Recovery Organization ----------
GRRO
Burt Farm & Livestock Co.
Swine farm in Marshalltown, IA
"Pork Nutrient Management Demonstration"

Report Status:
Demonstration project completed and final report has been received. Unused equipment is being dispositioned and salvage value is being reviewed.

Royal Consulting Services, Inc. ----------
Posey Dairy in Lake Placid, FL
"Florida Dairy Nutrient Management Demonstration"

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

McGill Environmental Systems ----------
Delway, NC (Central Processing Facility) With
Poultry Litter Collected from 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.

Cape Fear Resource Conservation ----------
Rose Hill, NC - Central Processing Facility
Poultry Litter Collected from Duplin County, NC
"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.

Mountain Organic Materials (MOM) ----------
Randy Johnson and David Parsons Farms
Wilkesboro, NC
"Demonstration of Poultry Manure and Mortality Forced Aeration Composting Bin Systems"

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

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