



Florida Department of Health Bureau of Onsite Sewage Programs Research Review and Advisory Committee Meeting

DATE AND TIME: April 10, 2012 at 10:00 a.m. ET

PLACE: Florida Department of Health Southwood Complex
4042 Bald Cypress Way, Room #240P
Tallahassee, FL 32399

Or via conference call / web conference:

Toll free call in number: 1-888-808-6959

Conference code: 7427896255

Website: <http://connectpro22543231.na5.acrobat.com/rrac/>

This meeting is open to the public

AGENDA: FINAL 09April12

10:00 – 10:05	Introductions and Housekeeping
10:05 – 10:15	Review Minutes of Meeting January 4, 2012
10:15 – 10:45	Carmody Database System Update
10:45 – 12:30	Nitrogen Study Update <ol style="list-style-type: none">1. Funding update2. Discussion on draft Legislative Status Report
12:30 – 1:00	Update on 319 Grant: Performance of Advanced Onsite Sewage Treatment and Disposal Systems
1:00 – 1:30	Research Budget Update and Project Funding Priorities
1:30 – 1:45	Other Business
1:45 – 2:00	Public Comment
2:00 – 2:15	Closing Comments, Next Meeting, and Adjournment

NOTE: Time slots are approximate and may be subject to change.



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NOTE: Time slots are approximate and may be subject to change.

Florida Department of Health
Research Review and Advisory Committee for the Bureau of Onsite Sewage Programs

Draft Minutes of the Meeting held at the Southwood Office Complex, Tallahassee, FL
January 4, 2012

In attendance:

- **Committee Members and Alternates:**

- In person:**

- Craig Diamond (member, Environmental Interest Group)
 - Carl Ludecke (vice-chairman, member, Home Building Industry)
 - Bill Melton (member, Consumer)
 - Eanix Poole (alternate, Consumer)

- Via teleconference:**

- Quentin (Bob) Beitel (alternate, Real Estate Profession)
 - Taylor Brown (alternate, Division of Environmental Health)
 - Wayne Crotty (member, Septic Tank Industry)
 - Susan McKinley (alternate, Restaurant Industry)
 - David Richardson (alternate, Local Government)
 - John Schert (member, State University System)

- Absent members and alternates:**

- Paul Davis (member, Division of Environmental Health)
 - John Dryden (alternate, State University System)
 - Tom Higginbotham (alternate, Division of Environmental Health)
 - Bob Himschoot (alternate, Septic Tank Industry)
 - Kriss Kaye (alternate, Home Building Industry)
 - Tom Miller (member, Local Government)
 - Jim Peters (alternate, Professional Engineer)
 - Geoff Luebkekmann (member, Restaurant Industry)
 - Clay Tappan (chairman, member, Professional Engineer)

- **Visitors:**

- Via teleconference:**

- Damann Anderson (Hazen and Sawyer)
 - Josefina Hirst (Hazen and Sawyer)
 - Mary Howard (Seminole CHD)
 - Maria Pecoraro (Rep. Nelson)
 - Patti Sanzone (DEP)
 - Maurice Tobon
 - Pam Tucker

- **Department of Health (DOH), Bureau of Onsite Sewage Programs:**

- In person:**

- Eberhard Roeder, Professional Engineer
 - Elke Ursin, Environmental Health Program Consultant

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- 1. Introductions** – Nine out of ten groups were present, representing a quorum. The group that was not represented was the Professional Engineers. Vice-Chairman Ludecke called the meeting to order at 10:05 a.m. Introductions were made and some housekeeping issues were discussed.

Changes to the committee since the last meeting were that Craig Diamond is the new member for the Environmental Interest Group, Wayne Crotty is the new member and Bob Himschoot is now the alternate for the Septic Tank Industry, Paul Davis is the new member with Tom Higginbotham and Taylor Brown as the alternates for the Florida Department of Health, and Geoff Luebke is the new member with Susan McKinley as the alternate for the Restaurant Industry. Kim Dove, the Department of Health member, and Mike McInarnay, the Septic Tank Industry alternate have both left the committee and thank you letters have been sent from the Department of Health. Thank you letters from the RRAC were sent to Patti Sanzone and Sam Averett, per a motion at the last RRAC meeting.

- 2. Review of previous meeting minutes** – The minutes of the November 15, 2011 meeting were reviewed.

Motion by Bill Melton, seconded by Susan McKinley, to approve the minutes as presented. All were in favor, with Craig Diamond abstaining, and none opposed and the motion passed unanimously.

- 3. Nitrogen Study Update** – Elke Ursin presented an update on the status of the letters of support for the nitrogen study. She stated that a support letter was drafted and sent to Lee Constantine, the Chairman of the Wekiva River Basin Commission. The Technical Review and Advisory Panel sent a letter of support to Senator Alexander, Speaker Cannon, Representative Grimsley, President Haridopolos, Senator Hays, Representative Hooper, Representative Hudson, Senator Negron, and Representative Williams on January 3, 2012. The RRAC letter of support is being drafted by Clay Tappan. Elke Ursin also stated that a presentation by Damann Anderson has been accepted on the nitrogen study at the University of Florida Water Institute Symposium on February 16, 2012. The Legislative Progress Report on the nitrogen study was sent on December 21, 2011 to the Governor, Speaker of the House, and President of the Senate. Quentin Beitel complemented the staff for putting this report together on a timely basis. Damann Anderson presented on some of the progress on the study since the last RRAC meeting in November. The last sampling event has been completed for the mound system at the Gulf Coast Research and Education Center (GCREC). Analysis of the data will show the soil and groundwater fate and transport of nitrogen around the existing mound system. A literature review was completed and data set specifications were made for a simulation model of bioreactor filtration treatment of onsite wastewater. This model will predict the performance of the tank-based systems tested at GCREC under the Passive Nitrogen Removal II (PNRS II) study. Design and construction has been completed for the passive in-situ in-ground test systems at the GCREC test facility. Damann Anderson went over some details on the construction of the soil and groundwater test facility. He stated that the PNRS II tank-based systems that were at the GCREC test facility have been tested and they are in the process now of developing the criteria to design those type of systems to be installed at individual homes. The next phase of work at the GCREC facility was to look at in-ground systems which are more of a drainfield system for passive nitrogen removal where nitrification occurs in one layer of soil and denitrification occurs in another. Two pilot scale in-ground systems have been constructed for testing. They are also developing test criteria to install these types of systems at individual homes. Also, four different in-situ systems were built to look at groundwater fate and transport of nitrogen. With these four systems they are looking at the difference between drainfields receiving nitrified

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effluent versus conventional septic tank strength effluent as well as the difference between receiving drip irrigation versus a gravel trench. Josefin Hirst went through the soil and groundwater test facility construction progress report showing several photos of the construction. Damann Anderson explained how the pilot scale in-ground systems are constructed. There is nitrification expected to occur in the sand above the liner, then there is a layer of lignocellulosic and sand on the liner which is where some saturation occurs and the wastewater collects at the bottom of the liner and goes into a pipe which flows into a tank that is filled with sulphur and effluent for denitrification. The final denitrified effluent flows out of the tank into an Infiltrator chamber. Craig Diamond asked what the anticipated life-span is of the ligno material and Damann Anderson stated that that is one of the questions to be answered with the research but the hope is to design a system that will work for 15-20 years. Carl Ludecke asked whether this in-ground system could be installed under a drainfield in a non-mounded situation and Damann Anderson stated that if the groundwater is deeper this could be installed without a mound. Carl Ludecke stated that he wanted to make it clear that there is a simpler way to install these systems but that what Damann and his group are working on now is testing and developing the criteria for these in-ground systems. Eanix Poole asked how deep the ligno material was and Damann Anderson stated that the liner is a "V" shape, so the depth is variable but is about 10-12 inches in the middle tapering off at the outside edges. Damann Anderson stated that they have made good progress on this and that this will yield interesting results. In the next month or two they will be ready to install tank-based systems at homes sites now that the pilot testing has been done. Carl Ludecke stated that it is important for everyone to understand how far this project has come along. Quentin Beitel asked whether there is a no-pump passive system at the facility and Damann Anderson stated that there is no way to do that at the facility because of the groundwater but that one will be installed at an actual home site.

- 4. Update on 319 Grant: Performance of Advanced Onsite Sewage Treatment and Disposal Systems** – Elke Ursin gave an update on the project. This project is to assess water quality protection by advanced (ATU, PBTS, etc.) systems throughout Florida. The grant period is now over, having ended on September 30, 2011. The final invoice and final progress report has been sent to DEP. Final reports have been submitted for the Monroe Diurnal and Seasonal Variability of Advanced Systems as well as the final report on the Database of Advanced Systems outlining the database development, database structure, and summary statistics.

The executive summary of the Monroe County report was included in the presentation but not discussed in great detail as most of this had been discussed at the November meeting, had been sent to the RRAC, and is posted online. Eanix Poole complimented staff for a nice job on this report. Quentin Beitel asked if there has been any feedback from the agencies that received the report and Patti Sanzone stated that the report was submitted to EPA last Friday and that the study was done for DOH's information and there was no expectation that EPA or DEP will come back with comments. Craig Diamond asked if this report will be shared with the Areas of Critical State Concern Program and DOH staff indicated that that would be a good idea and will send it to them. Eanix Poole brought up an observation he made while reading this report along with another report done in Wakulla County by DEP and FSU. He sees that very few systems are meeting the nitrogen and phosphorus standards that are enacted by local governments. He was wondering how the RRAC should respond to that as it involves so many different interest groups. He stated that these systems should meet the nutrient standards that they are expected to meet and are not. Damann Anderson stated that a lot of reports, not just in Florida, are showing the same thing: that the systems are not performing in the field. He stated that there are lots of issues and it is expensive to address. That is one of the reasons he is in favor of passive systems. Eanix Poole stated that the strength of the waste in the field is higher than NSF testing strength. Damann Anderson stated that the performance standard has to be measured and there is no real requirement to monitor these

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systems. He suggests monitoring quarterly for the first year and if the result is not in compliance then do more monitoring. This will weed out the systems that do not work. If the results are in compliance, then the monitoring requirement could be reduced. Bill Melton stated that sampling used to be a requirement but was taken out. Damann Anderson stated that it is very difficult to get the more complicated nutrient reducing systems to work without monitoring. He said that people will be spending a lot of money and will not get the results. Eb Roeder stated that the cost of these advanced system is variable, they are often less than \$10,000 in Wakulla. One of the questions this study hopes to answer is whether it is the technology that is the problem or whether it is the usage of the systems, for example when they are turned off. He stated that the systems that are working remove three-quarters of the nitrogen but with a high influent strength they do not meet the performance standard. He said there are many factors at play and that one of the things that will be looked at with this study is whether the activated sludge systems perform differently from the fixed media systems.

Elke Ursin presented on some of the results of the summary statistics on the project database. Approximately 16,595 advanced systems were identified from four main sources (DOH's Environmental Health Database, Carmody, county health department databases, and innovative permit files). Over 60% of the advanced systems in Florida are contained in Monroe, Charlotte, Brevard, Franklin, and Lee counties. The samplers that were utilized from the county health departments for this project were located in each of these counties except for Franklin County, which was sampled by a DOH employee from Wakulla County who also sampled most of the rest of the state; and Brevard County, which was sampled by several employees from Volusia County. Elke Ursin went into some of the geocoding results which basically showed that the addresses in the database were good physical addresses. She also showed some statistics on how many of the records were associated with either a construction permit number, operating permit number, or both. Having these numbers increases the likelihood that there is further information on a system (i.e. type and size of system installed, when system was installed). She showed a table on the frequency of the type of advanced system, which demonstrated that the vast majority of the advanced systems in the state are aerobic treatment unit (ATU) systems. Of the systems that had a final system approval date, 75% were installed within 2-5 years of January 1, 2010. About 56% of the systems had technology information. Eighty-eight percent of these systems utilized extended aeration. The top five manufacturers in Florida are Consolidated, Aqua-Klear, Hoot, Norweco, and Clearstream.

Elke Ursin presented on the progress that has been made on the remaining tasks associated with this project. Data entry is ongoing with several bureau staff assisting. As of December 20, 2011 395 out of over 1,000 records need data entry and 707 records need a quality control review. There is a task looking at management practices that is currently ongoing. A database was created linking program evaluations over the past ten years with the survey results for regulators and system owners/users. There will also be links made between the county program evaluation, county survey information, and the sample results. Analysis on this has begun, and will be completed and summarized in the final task report and in a case study booklet format. The final project report is anticipated to be written after all the data entry and data analysis has been completed. The draft report will be presented to the RRAC for review prior to finalization and submission to DEP.

5. **Other Business** – Quentin Beitel requested that an update be given at the next RRAC meeting on the Carmody system: who's using it, the quality of the data, etc. Elke Ursin stated that she will see whether Scott Carmody might be able to come to the next meeting and if not will make sure there is someone from DOH staff to discuss some of this.

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6. **Public Comment** – The public were allowed to comment throughout the meeting. There was no additional public comment.
7. **Closing Comments, Next Meeting, and Adjournment** – Quentin Beitel reminded RRAC members that the Legislature will start meeting next week and recommended that RRAC members contact legislators regarding the nitrogen study. The next RRAC meeting will occur at some point in the future, with a date to be determined via email. The meeting adjourned at 11:12 a.m.

DRAFT

Florida Department of Health
Research Review and Advisory Committee for the Bureau of Onsite Sewage Programs

Approved Minutes of the Meeting held at the Southwood Office Complex, Tallahassee, FL
April 10, 2012

In attendance:

- **Committee Members and Alternates:**

- In person:**

- Craig Diamond (member, Environmental Interest Group)
 - Carl Ludecke (vice-chairman, member, Home Building Industry)
 - Bill Melton (member, Consumer)
 - Clay Tappan (chairman, member, Professional Engineer)

- Via teleconference:**

- Quentin (Bob) Beitel (alternate, Real Estate Profession)
 - Taylor Brown (alternate, Division of Environmental Health)
 - Wayne Crotty (member, Septic Tank Industry)
 - Paul Davis (member, Division of Environmental Health)
 - Bob Himschoot (alternate, Septic Tank Industry)
 - Kriss Kaye (alternate, Home Building Industry)
 - Susan McKinley (alternate, Restaurant Industry)
 - Jim Peters (alternate, Professional Engineer)
 - Eanix Poole (alternate, Consumer)

- Absent members and alternates:**

- John Dryden (alternate, State University System)
 - Tom Higginbotham (alternate, Division of Environmental Health)
 - Geoff Luebkekmann (member, Restaurant Industry)
 - Tom Miller (member, Local Government)
 - David Richardson (alternate, Local Government)
 - John Schert (member, State University System)

- **Visitors:**

- In person:**

- Bruce French (York)
 - Shanin Speas Frost (DEP)

- Via teleconference:**

- Damann Anderson (Hazen and Sawyer)
 - Alice Berkley (Commissioner Brummer)
 - Shirish Bhat (ECT)
 - Scott Carmody (Carmody)
 - Kim Dinkins (Marion County)
 - Roxanne Groover (FOWA)
 - Richard Hicks (DEP)
 - Josefin Hirst (Hazen and Sawyer)
 - Len Moore
 - Maria Pecoraro (Rep. Nelson)
 - Andrea Samson
 - Patti Sanzone (DEP)
 - Pam Tucker

- **Department of Health (DOH), Bureau of Onsite Sewage Programs:**

- In person:**

- Kara Loewe, Distributed computer Systems Consultant
 - Eberhard Roeder, Professional Engineer
 - Elke Ursin, Environmental Health Program Consultant

- Via teleconference:**

- Ed Barranco, Environmental Administrator
 - Kim Duffek, Environmental Health Program Consultant

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1. **Introductions** – Eight out of ten groups were present, representing a quorum. The groups that were not represented were the State University System and Local Governments. Chairman Tappan called the meeting to order at 10:02 a.m. The agenda was outlined, introductions were made, and some housekeeping issues were discussed. There were no changes to the committee since the last meeting.
2. **Review of previous meeting minutes** – The minutes of the January 4, 2012 meeting were reviewed.

Motion by Craig Diamond, seconded by Carl Ludecke, to approve the minutes as presented. All were in favor and none opposed and the motion passed unanimously.

3. **Carmody Database System Update** – Scott Carmody presented on his tracking database system which is funded through the Florida Department of Environmental Protection (DEP). This web-based database tracks various things associated with onsite sewage systems (maintenance and management of advanced treatment systems, system locations, etc.) He demonstrated how the system works by sharing his screen with meeting attendees. He said that he has been working in the onsite field for about 12 years, in 14 states, and is expanding to the Cayman Islands and Australia. He has been working in Florida for almost all of the 12 years that he has been in business. The first step in setting up a database for a new client is to establish what data is available, and build a starter inventory. The system has five different user levels: contractor, view only, regulator, state, and national. He indicated that the system is very flexible. The system allows for interaction and communication between contractors and regulators. The system tracks by components on a property, not by address, because one system may have several different components. The contract with DEP allows county health departments to use this program. It is a voluntary system, with all of the counties having access, and there is no requirement to use the system. Scott Carmody stated that he believes his system is tracking 85-90% of all ATUs in the ground in Florida. Clay Tappan asked if there are any mandatory fields to make it easier for data to roll up to the state level for analysis and Scott Carmody stated that there are no mandatory fields and that each county can use the system to best serve their needs. Scott Carmody indicated that he does not have the power to tell the counties what to do; he is providing a tool for them to use. The system captures failure rates for state inspections and it was clarified that failure does not necessarily mean that there is sewage on the ground because the system is failing, it means that the system inspection failed, which could be from various issues (i.e. the maintenance contract has expired). Quentin Beitel asked how signatures certifying these reports are tracked in the database and Scott Carmody stated that it is tracked by user name and password. Quentin Beitel asked if this system is just for septic contractors and regulators or whether private entities that want to track their onsite sewage systems could use the system too, and Scott Carmody answered that anyone can use the system and that he is doing something similar to this right now to track grease interceptor servicing. Clay Tappan asked if anyone could request a password and account and Scott Carmody stated that the program is designed for reporting but that data requests could be made which would need to be cleared with the County Health Department. Elke Ursin asked if she could obtain a password to see the state regulator information and Scott Carmody asked for an upload of information from the Department of Health's Environmental Health Database. There was some discussion on integrating Carmody with the Department of Health's Environmental Health Database. This is currently being worked out by DOH. There have been some communication issues between DOH and Carmody, and this discussion will continue at another time. It was clarified that CHD's are not penalized in their audit for any data contained in the Carmody system.

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He then demonstrated the septic search website (<http://www.septicsearch.com>). This website allows anyone to access service record history and permit documents for a component/property. Some realtors link to this in the MLS system. Scott Carmody stated that in order for this to be a successful program all of the stakeholders need to come together: owners, contractors, regulators, real estate professionals, and Florida citizens. Quentin Beitel stated that he wants to make sure that consideration is made to the certification process for inspections in light of any new legislation that may come through. Taylor Brown spoke about the experience of using the Carmody system in Lee County and that it has helped them a lot. Bill Melton asked about the status of the funding for this program and Scott Carmody stated that it is funded by DEP and the contract was just renewed for another three years.

- 4. Nitrogen Study Update** – Elke Ursin presented on the nitrogen reduction strategies study. She started with a funding update. The House and Senate budget includes \$1,500,000 in both budget and cash for continuation of the study. The budget was sent to the Governor on April 9th, and Elke Ursin’s understanding was that the governor has two weeks to review the budget. Once the Governor has completed his review another RRAC meeting may need to be set to discuss the process forward. Quentin Beitel suggested scheduling this meeting soon so that the determination of the process forward can be done quickly. The legislative status report is due on May 16, 2012 to the Governor, Speaker of the House, and President of the Senate. The draft report was edited page by page. Elke Ursin stated that in order to meet internal review times the report will need to begin the routing process this week. Due to the uncertainty regarding the funding there were several places in the report which were marked as “pending the Governor’s action”. This language may need to be changed when a decision is made.

Motion by Quentin Beitel, seconded by Carl Ludecke, to allow staff to update the language throughout the report regarding the Governor’s action on the budget. All were in favor and none opposed and the motion passed unanimously.

A new table (Table 2) was proposed to be inserted in Section 2 to show the field work status by county for Tasks B and C. There was a discussion on what information this table should include.

Motion by Carl Ludecke, seconded by Craig Diamond, to adopt Table 2 as formatted. All were in favor and none opposed and the motion passed unanimously.

Motion by Carl Ludecke, seconded by Craig Diamond, to authorize staff to make the changes to the status report discussed during the meeting. All were in favor and none opposed and the motion passed unanimously.

Quentin Beitel asked if a cover letter goes with this report and Elke Ursin stated that there is one and it has been drafted. The cover letter has a standard format and includes information straight from the executive summary of the report.

Elke Ursin provided a brief update on the progress the study has made since the last meeting. The monitoring of the mound system at the Gulf Coast Research and Education Center has been completed. Two field site sample events have been completed as part of Task B for a site in Wakulla County. One field site sample event has been completed as part of Task C for a site in

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Seminole County, and another field site property owner agreement has been signed for a site in Polk County. Progress reports for both the simple and complex soil tools have been submitted and reviewed by staff.

- 5. Update on 319 Grant: Performance of Advanced Onsite Sewage Treatment and Disposal Systems** – Elke Ursin gave an update on the project. This project is to assess water quality protection by advanced (ATU, PBTS, etc.) systems throughout Florida. The grant period is now over, having ended on September 30, 2011. The final invoice and final progress report has been sent to DEP in 2011. Final reports have been submitted for the Monroe Diurnal and Seasonal Variability of Advanced Systems as well as the final report on the Database of Advanced Systems outlining the database development, database structure, and summary statistics.

Elke Ursin presented on the progress that has been made on the remaining tasks associated with this project. Data entry is ongoing with several bureau staff assisting. As of April 5, 2012, 220 out of over 1,000 records still need data entry and 399 records need a quality control review done on the data entry. The ones that need data entry are also included in the quality control review number. Elke Ursin explained that each record can take up to 20 minutes to enter and the quality control often takes almost the same amount of time. She stated that there are a lot of details that are captured with this data entry, but it is time consuming. She stated that staff has started analyzing the sample data. There is a task looking at management practices that is currently ongoing. A database was created linking program evaluations over the past ten years with the survey results for regulators and system owners/users. There will also be links made between the county program evaluation, county survey information, and the sample results. Analysis on this has begun, and will be completed and summarized in the final task report and in a case study booklet format. The final project report is anticipated to be written after all the data entry and data analysis has been completed. The draft report will be presented to the RRAC for review prior to finalization and submission to DEP.

- 6. Research Budget Update and Project Funding Priorities** – Elke Ursin presented the current research budget. Funding for the research program comes from a \$5 surcharge on new septic system permits. The total revenue collected from July 1, 2011 through March 27, 2012 is \$41,400 and the total expenditures are \$53,070. She explained that this is not for a full year as this fiscal year is still in progress. She presented the 2010 – 2011 budget numbers: \$55,738 in revenue and \$76,156 in expenditures. The total research program ending cash balance as of March 27, 2012 is \$470,785.

Elke Ursin has been tasked with trying to find out how to do research projects at little to no cost. She went through each research project and outlined what could be done on each project utilizing mostly staff time. There are two projects that have been on the research project list for some time, and then five projects that were prioritized by the RRAC in early 2011.

The Alternative Drainfield Product Assessment project's purpose is to compare the functioning of alternative drainfield materials to standard aggregate. This was originally approved by the RRAC in 2006, a contract was issued, but was canceled due to industry concerns. The project was re-prioritized in 2008 and was split into three phases. Phase I was to evaluate existing data, phase II was to create an advisory group to find ways to fill the data gaps, and the third phase was to gather the data to fill in the gaps. RRAC directed staff in 2010 to start phase I and some work has been done. There was a discussion on the work that NSF has done looking at alternative drainfield products.

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The objective of the Columbia County Well Sampling project is to determine whether pathogens and nutrients in well water on river-front lots are elevated and affected by either river or septic system influences, and whether there is any seasonal variability in this. The project was approved by RRAC for every budget cycle since 2007 and the cost is lab analysis only. There was a discussion on the project and staff is to determine the sampling needs and costs and then come back to RRAC for further discussion.

The continuation of the 2009 inventory of OSTDS in Florida project would update the inventory and develop a way to automate this process. This was the #1 ranked research project in 2011. Most of the tasks associated with the approach will cost money and very little can be done by research staff alone. Elke Ursin stated that there has been a lot of interest in the inventory information from various places and that it would be a good first step for those counties that are going to proceed with an evaluation program. There was a general consensus from RRAC that this is still a very high priority project. Bill Melton asked why the research funds that are listed in the budget could not be used and Elke Ursin stated that we have the cash but not the spending authority. There was interest from the RRAC to request the authority to spend funds on this project.

Next, the project looking at the effectiveness of outlet filters was discussed. This project is to help determine whether outlet filters are performing as expected, determine maintenance frequency, and determine whether approval standards are adequate. NSF has established a task group to address outlet filter concerns, but this effort has been more focused on determining the function of outlet filters and developing a testing protocol, not necessarily addressing what happens in the field.

A project looking at the life expectancy of onsite systems was discussed. This project is to determine the life expectancy of a septic tank and various kinds of drainfields. This project could be done by staff, but it will be time intensive.

Next, a project looking at drip disposal with septic tank quality effluent was discussed. This project is to determine the effectiveness of permitting drip disposal using septic tank quality effluent and to determine maintenance requirements. The Nitrogen Reduction Strategies Study is testing this at the test center. A literature review of existing research could be done by research program staff.

The final project discussed was one looking at the correlations between water quality, OSTDS, and health effects which would be using GIS to perform an analysis based on existing data. Staff could gather and analyze the data but this would be a time intensive project.

After hearing the list of projects, Elke Ursin asked the RRAC for direction on how to prioritize her time with the understanding that there would be little to no research funds available. There was a discussion on the possibility of requesting from DOH the authority to spend some of the research funds on the inventory project and some of the other projects. A legislative budget request may need to be applied for. Elke Ursin will look into options and report back to the RRAC.

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Research Review and Advisory Committee for the Bureau of Onsite Sewage Programs**

Motion by Craig Diamond, seconded by Bill Melton, to approve the re-ranking of research priorities as follows:

- 1. Completion of 319 project**
- 2. Alternative Drainfield project**
- 3. Outlet Filter project**
- 4. Drip irrigation project**

All were in favor and none opposed and the motion passed unanimously.

Motion by Craig Diamond, seconded by Bill Melton, for staff to provide RRAC with the proper procedure on how RRAC can request authority to spend research funds. All were in favor and none opposed and the motion passed unanimously.

- 7. Other Business** – There was no discussion on other business.
- 8. Public Comment** – The public were allowed to comment throughout the meeting. There was no additional public comment.
- 9. Closing Comments, Next Meeting, and Adjournment** – Topics for the next RRAC meeting will be to discuss the process forward with the nitrogen study depending on the results of the final 2012-2013 FY budget. RRAC directed Elke Ursin to send an email once a decision has been made regarding the budget. The next RRAC meeting will occur at some point in the future, with a date to be determined via email. The meeting adjourned at 2:37 p.m.

Motion to adjourn by Bill Melton, seconded by Clay Tappan. All were in favor and none opposed and the motion passed unanimously.

AMENDMENT # 003

THIS AMENDMENT, entered into between the State of Florida, Department of Health, hereinafter referred to as the "department" and Hazen and Sawyer, P.C., hereinafter referred to as the "provider", amends contract # CORCL as follows:

1. Attachment I.B.1.a), first paragraph, final sentence is amended to read:

Following the task and deliverable descriptions is a table (Table I) summarizing the estimated cost components by deliverable and funding phase.

2. Attachment I.B.1.a), second paragraph is amended to read:

Some tasks are identified to occur in subsequent years. As funding is authorized by the legislature from year to year, the department will authorize the provider to proceed with the individual tasks in writing.

3. Attachment I.B.1.a), Task A, Sub-task and Deliverables 10, second paragraph, final sentence is amended to read:

Deliverable: Innovative system application (per technology).

4. Attachment I.B.1.a), Task A, Sub-task and Deliverables 11, second paragraph, final sentence is amended to read:

Deliverable: Additional information resulting in an innovative permit by the department (per technology if additional information is requested by the department).

5. Attachment I.B.1.a), Task A, Sub-task and Deliverables 17, second paragraph, first sentence is amended to read:

Specification reports, materials list and cost and as-built diagrams of the treatment systems to be tested as part of PNRS II, one for the in-tank PNRS II testing and one for the in-situ testing.

6. Attachment I.B.1.a), Task A, Sub-task and Deliverables 25, first paragraph, final sentence is amended to read:

Sampling events subsequent to the number in the budget for Phase 2 of this task are subject to available funding and the department shall authorize the provider in writing to perform each additional sampling event.

7. Attachment I.B.1.a), Task A, Sub-task and Deliverables 27, first paragraph, second sentence, is amended to read:

For each nitrogen reduction technology tested at the GCREC pilot facility a technical description will be prepared that includes name, supplier, operating principles, salient physical description, flow sequence, pertinent design details, manufacturer or designer claims of treatment goals, and operating recommendations.

8. Attachment I.B.1.a), Task A, Sub-task and Deliverables 28, first paragraph, first sentence, is amended to read:

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The department will gather comments on the draft report from RRAC and FDOH review and transmit such comments to the provider within one month of receiving the draft.

9. Attachment I.B.1.a), Task A, Sub-task and Deliverables 29, first paragraph, first sentence, is amended to read:

The provider will submit a draft final report summarizing the results of the technology classification, ranking and prioritization efforts in Task A and the conclusions from PNRSII and provide recommendations for onsite nitrogen reduction technologies for Florida.

10. Attachment I.B.1.a), Task B, Sub-task and Deliverables 1, first paragraph, fifth sentence is amended to read:

Written homeowner agreements will specify the arrangements in regards to responsibility for application for permits, modifications, operation, maintenance, monitoring, inspections, removal or leaving the system in place at study termination.

11. Attachment I.B.1.a), Task B, Sub-task and Deliverables 1, first paragraph, final sentence is amended to read:

Up to ten (10) home sites at various locations in Florida (e.g. Wekiva Study Area, Wakulla and south Florida) will be identified for potential testing under this task.

12. Attachment I.B.1.a), Task B, Sub-task and Deliverables 2, first paragraph, final sentence is amended to read:

Up to 2 vendors will be identified for testing under this task.

13. Attachment I.B.1.a), Task B, Sub-task and Deliverables 7, sub-task title is amended to read:

Field Systems Monitoring Report (per system, per event)

14. Attachment I.B.1.a), Task C, Sub-task and Deliverables 3, fifth paragraph, final sentence is amended to add:

HOWEVER, AMENDMENTS TO THE QAPP MAY CONTINUE THROUGHOUT THE PROJECT.

15. Attachment I.B.1.a), Task C, Sub-task and Deliverables 5, second paragraph, final sentence is amended to add:

HOWEVER, AMENDMENTS TO THE QAPP MAY CONTINUE THROUGHOUT THE PROJECT.

16. Attachment I.B.1.a), Task C, Sub-task and Deliverables 11, first paragraph, final sentence is amended to read:

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The amount paid will be the total documented Task C construction cost less the amount paid to provider in subtask C-10 above.

17. Attachment I.B.1.a), Task C, Sub-task and Deliverables 19, first paragraph, third sentence is amended to read:

Monitoring at the sites will be used to assess the current level of nitrogen reduction obtained by Florida soils, to assess groundwater impacts due to conventional systems, and to provide data for parameter estimation, and verification and validation of models developed in Task D.

18. Attachment I.B.1.a), Task C, Sub-task and Deliverables 19, first paragraph, fifth sentence is amended to read:

Specifically, key conditions of importance will be the hydraulic loading regime, the rate of effluent discharged to the soil, and the effluent quality (e.g. BOD, nitrogen) discharged to the soil.

19. Attachment I.B.1.a), Task C, Sub-task and Deliverables 19, second paragraph, second sentence is amended to read:

It is anticipated that up to seven (7) field sites will be identified for potential inclusion in the study.

20. Attachment I.B.1.a), Task C, Sub-task and Deliverables 23, first paragraph, final sentence is amended to read:

A monitoring installation report will be provided by the provider for each of up to four (4) individual home sites describing the monitoring system.

21. Attachment I.B.1.a), Task C, Sub-task and Deliverables 24, second paragraph, final sentence is amended to read:

Deliverable: Sampling event report (per sampling event, per site).

22. Attachment I.B.1.a), Task C, Sub-task and Deliverables 25, second paragraph, final sentence is amended to read:

Deliverables: Data Summary Reports (per sampling event, per site).

23. Attachment I.B.1.a), Task C, Sub-task and Deliverables 26, sub-task title is amended to read:

Draft Site Summary and Close-out Memo (each site)

24. Attachment I.B.1.a), Task C, Sub-task and Deliverables 26, first paragraph is amended to read:

The provider will prepare data tables summarizing the observations for each site, including site conditions, onsite system characteristics and soil and ground water concentrations and conditions found.

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25. Attachment I.B.1.a), Task C, Sub-task and Deliverables 26, third paragraph is amended to read:

A report will be provided to the department to document close-out of each home site. The draft close-out memos will be submitted to FDOH for review and comment.

26. Attachment I.B.1.a), Task C, Sub-task and Deliverables 26, fourth paragraph is amended to read:

Deliverable: Draft Site Close-out memo.

27. Attachment I.B.1.a), Task C, Sub-task and Deliverables 27, sub-task title is amended to read:

Final Site Close-out Memo (each site)

28. Attachment I.B.1.a), Task C, Sub-task and Deliverables 27, first paragraph is amended to read:

Comments will be provided by the department within two weeks of receipt and the provider will prepare a final close-out memo.

29. Attachment I.B.1.a), Task C, Sub-task and Deliverables 27, second paragraph is amended to read:

Deliverable: Final site close-out memo acceptable to FDOH.

30. Attachment I.B.1.a), Task D, first paragraph is amended to read:

The objectives of Task D are:

- Literature Review
- Plan Development
- Model Development
 - Simple soil tool to estimate nitrogen removal in Florida soils
 - Complex soil treatment module for input into the groundwater modeling tool
 - Analytical modeling tool to predict temporal and spatial concentrations and fluxes of nitrate in groundwater
 - Integration of complex soil treatment module with the groundwater analytical model
 - Incorporation of multiple spatial inputs (i.e., development scale model)
- Performance Evaluation
 - Select existing site data for model-performance evaluation
 - Calibrate/corroborate models using existing site data (including from Task C)
 - Validate models
 - Conduct uncertainty analysis of model input parameters
- Decision Support Framework
 - Guidance for determining model input parameters

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- o Risk-based approach for model selection

31. Attachment I.B.1.a), Task D, Sub-task and Deliverables 6, second paragraph is amended to add:

AMENDMENTS TO THE QAPP MAY CONTINUE THROUGHOUT THE PROJECT.

32. Attachment I.B.1.a), Task D, Sub-task and Deliverables 7 is amended to read:

Simple Soil Tools

The simple soil tools will be a series of look-up tables providing estimated nitrogen removal based on common OSTDS operating conditions. The tables will be generated from the complex soil model developed in subsequent tasks (subtask D8 through D13), or from existing numerical models (e.g., HYDRUS-2D). The model will be corroborated and calibrated for a subset of conditions for which data exist. The specific conditions included in the simple soil model tools will be limited (not to exceed 60 conditions) and agreed upon by FDOH.

Deliverable: Report describing simple soil tool development, tool use, and the look-up tables.

33. Attachment I.B.1.a), Task D, Sub-task and Deliverables 8 is amended to read:

Complex Soil Model

This subtask includes development of the conceptual framework for the complex soil model including the coding and code evaluation required to implement the theory. The complex soil model will be based on unsaturated soil transport mechanisms adapted to Florida-specific soil and climate data, but incorporated into a simplified approach (e.g., STUMOD programmed into a Microsoft Excel spreadsheet) that includes parameters representing dominant soil properties. The soil treatment module will enable estimation of site-specific soil treatment in the vadose zone with the model output being the loading at the water table (input to aquifer models). This soil-treatment module will be developed to account for evapotranspiration, and the effect of high/seasonal variable water tables on nitrogen removal in the soil.

Deliverables: Complex Soil Model Specification Report including theory for coding and code evaluation progress.

34. Attachment I.B.1.a), Task D, Sub-task and Deliverables 9 is amended to read:

Complex Soil Model Performance Evaluation

The general user will most likely assess performance by comparing model output to field observations (e.g., simplified comparison of values). Similar implementation checks will be performed using robust field data sets (as available). Performance evaluation will also include corroboration/calibration to better understand the quality and quantity of data required by comparing simulated parameter values to the corresponding measured values (calibration targets). Calibration targets will include nitrogen concentrations (weighted equally in space) and mass loading of contaminant from the OSTDS. In addition, a parameter sensitivity analysis will be performed to identify the most relevant model parameters. An uncertainty analysis

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will also be performed where probability-based ranges for model input parameters will be used to generate probable model outcomes.

A more rigorous performance evaluation approach is required for technical users. For this case, the model-performance assessment will be conducted by using model-evaluation statistics to determine whether the model can appropriately simulate the observed data. Multiple methods for evaluating the model performance will be used to ensure model quality assurance evaluation that is not hindered by the specific limitations of a single calibration statistic or identify if further evaluation of the model is warranted.

Deliverable: Report describing performance evaluation methods and results with the draft model in electronic format (e.g., Microsoft Excel spreadsheet).

35. Attachment I.B.1.a), Task D, Sub-task and Deliverables 10 is amended to read:

Validate/Refine Complex Soil Model

Based on the results from subtask D9, the complex soil model will be revised/improved. As additional data is available from Task C, the model will be revised to incorporate more complex mechanisms. Validation will be used to compare the corroborated/calibrated model to actual field data. Model validation ensures that the model meets the intended requirements and identifies the range of appropriate conditions (e.g., capabilities and limitations). Data from Task C home sites as well as other available data sources will be used to validate the model.

Deliverable: Complex Soil Model report, nomographs for conditions represented in D7, and the final complex soil model in electronic format (e.g., Microsoft Excel spreadsheet).

36. Attachment I.B.1.a), Task D, Sub-task and Deliverables 11 is amended to read:

Aquifer Model Combined with Complex Soil Model Development

A steady state or non-steady state aquifer model will be developed, possibly by revising an existing model, to simulate nitrogen concentrations and mass flux in space and time from a single OSTDS source, or a surface area that can be estimated as a single OSTDS source. This aquifer model and the complex soil model (D.10) will be integrated together to produce groundwater output predictions for nitrogen concentration or mass flux from a single OSTDS source. The integration will allow for utilization of simple soil model output as input for the aquifer model.

Deliverables:

- a. Aquifer Model Specification Report describing review and development of the aquifer model (subtask is 50% complete).
- b. Aquifer-Complex Soil Model Specification Report describing progress status for integrating the two models (subtask is 75% complete).
- c. Draft integrated model in electronic format (subtask is 100% complete).

37. Attachment I.B.1.a), Task D, Sub-task and Deliverables 12 is amended to read:

Aquifer-Complex Soil Model Performance Evaluation

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Performance evaluation of the aquifer-complex soil model will include implementation checks, corroboration/calibration, parameter sensitivity analysis and an uncertainty analysis. Data sets from Florida identified during subtask D3 and Task C will be used. Metrics will include comparisons of average concentration in the plume or mass flux crossing a boundary between actual field data (as available) and model output, the range in calibrated parameter set values that result in similar agreement between model results and data, model-parameter correlation and bias, and the potential for different parameter combinations to achieve the same agreement between model results and data.

Similar to the complex soil model, a more rigorous performance evaluation is also required. Model-evaluation statistics will be used to determine whether the model can appropriately simulate the observed data. Multiple methods for evaluating the model performance will be used to ensure model quality assurance evaluation that is not hindered by the specific limitations of a single calibration statistic or identify if further evaluation of the model is warranted.

Deliverables:

- a. Aquifer-Complex Soil Model Specification Memo describing progress status for performance evaluation (subtask is 50% complete).
- b. Report describing performance evaluation methods and preliminary results (subtask is 100% complete).

38. Attachment I.B.1.a), Task D, Sub-task and Deliverables 13 is amended to read:

Validate/Refine Aquifer-Complex Soil Model with Data Collection from Task C

Based on the results from subtask D12, the integrated aquifer and complex soil model will be revised/improved using site-scale field data collected from Task C. Validation will be used to compare the corroborated/calibrated model to actual field data. The validation/refinement procedure will be an iterative process and may suggest revisions in the data collection plan or in the model itself (parameterization or improvements). Data from Task C home sites as well as other available data sources will be used to validate the model.

Deliverable: Integrated Aquifer-Complex Soil Model report and the final integrated model in electronic format (e.g., Microsoft Excel spreadsheet).

39. Attachment I.B.1.a), Task D, Sub-task and Deliverables 14 is amended to read:

Development of Aquifer-Complex Soil Model for Multiple Spatial Inputs

A model will be developed, possibly by revising an existing model, to simulate nitrogen concentrations and mass flux in space and time from several OSTDS in a development-scale area. The model will be calibrated using existing data from a development-scale plume, based on metrics such as average concentration in the plume or mass flux crossing a boundary.

Deliverable: Aquifer-Complex Soil Model for Multiple Spatial Inputs report and the model in electronic format (e.g., Microsoft Excel spreadsheet).

40. Attachment I.B.1.a), Task D, Sub-task and Deliverables 15 is amended to read:

Decision-Making Framework Considering Uncertainty

A methodology will be developed to describe how planners can include the uncertainty associated with both calibrated and non-calibrated models in the decision-making process. The report will be in the form of a guidance manual to guide users through the assessment of parameters, tool selection, and how to use those tools.

Deliverable: Modeling decision-making framework report.

41. Attachment I.B.1.a), Task D, Sub-task and Deliverables 16 is amended to read:

Task D Guidance Manual (Draft)

The Task D draft final report will be developed based on a compilation of Task D reports, progress reports, and technical memos to summarize the results of the Task D modeling. The report will be in the form of a Guidance Manual and User's Guide providing a decision support framework (Task D.15), model development, input parameter selection, and uncertainty assessment. The Guidance Manual will provide an introduction to each tool, assumptions/limitations of the tool, and how to use the tools. The complementary User's Guide will provide detailed technical data including fundamental assumptions that were incorporated into tool development, description of the tool development, and description of parameters that affect nitrogen reduction performance.

Deliverable: Draft Task D Guidance Manual.

42. Attachment I.B.1.a), Task D, Sub-task and Deliverables 17 is amended to read:

Task D Guidance Manual (Final)

The department will gather comments on the draft guidance manual from RRAC and any other interested parties and transmit such comments to the provider within one month of receiving the draft. The provider will address these comments in preparing final deliverables within one month of receiving comments.

Deliverable: Final Task D Guidance Manual with final models in electronic format.

43. Attachment I.B.1.a), Task D, Sub-task and Deliverables 18 is amended to read:

Change-order Allowance

From time to time the Department may find it necessary to make minor changes or adjustments to activities under this task based on results that indicate a potential improvement to the project by making a change. Examples of such changes include additional or revised sample locations or parameters, minor modifications to test systems or field activities based on problems encountered, or conditions that develop requiring expedient actions to correct a potentially serious problem. Up to \$10,000 will be allocated from the contract budget for such minor changes to research activities under this task. Upon determination by the Department the changes should be made, all or a portion of these funds may be authorized by written notification from the Department to the Provider directing specific changes to research activities be made, and the amount budgeted for the changes specified.

Deliverable: As specified in the authorization.

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44. Attachment I.B.1.a), Task D, Sub-tasks and Deliverables 19 - 29 are removed from the contract.

45. Attachment I.B.1.a), Task E, third bullet is amended to read:

Attend and make presentations to RRAC and TRAP meetings

46. Attachment I.B.1.a), Task E, Sub-task and Deliverables 2 sub-task title is amended to read:

PM - Project Progress Reports (per bimonthly report)

47. Attachment I.B.1.a), Task E, Sub-task and Deliverables 2, first paragraph, first sentence is amended to read:

Bimonthly progress reports will be provided that summarize the general status of each task, progress during the reporting period, activities planned in the next reporting period, and any issues, problems or decisions with significant effect on project implementation.

48. Attachment I.B.1.a), Task E, Sub-task and Deliverables 5, first paragraph is amended to read:

Project Advisory Committee (PAC) review panel will be assembled and a project review meeting coordinated with the project team. Prior to the review meeting, PAC members will be provided information concerning the background and motivation for this project, goals, methods, and initial results. At the review meeting project team members will present the technical approach and findings such that the PAC can critique the project work. A summary report that documents PAC input and team response will be provided.

49. Attachment I.C.1. the paragraph entitled Fixed Price Presentation, is amended to add:

Shaded line items are items that have been completed prior to Amendment 3.

50. Attachment I pages 39-41 of the original contract are replaced by the attached Exhibit 1.

51. The provider agrees to utilize the U.S. Department of Homeland Security's E-Verify system, <https://e-verify.uscis.gov/emp>, to verify the employment eligibility of all new employees hired during the contract term by the Provider. The Provider shall also include a requirement in subcontracts that the subcontractor shall utilize the E-Verify system to verify the employment eligibility of all new employees hired by the subcontractor during the contract term. Contractors meeting the terms and conditions of the E-Verify System are deemed to be in compliance with this provision.

52. The Provider agrees to refrain from any of the prohibited business activities with the Governments of Sudan and Iran as described in s.215.473, F.S. Pursuant to ss.287.135(5), F.S., the department shall bring a civil action against any company that falsely certifies its status on the Scrutinized Companies with Activities in Sudan or the Iran Petroleum Energy Sector Lists. The provider agrees that the department shall take

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civil action against the provider as described in ss. 287.135(5) (a), F.S., if the provider fails to demonstrate that the determination of false certification was made in error.

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This amendment shall begin on December 10, 2011, or the date on which the amendment has been signed by both parties, whichever is later.

All provisions in the contract and any attachments thereto in conflict with this amendment shall be and are hereby changed to conform with this amendment.

All provisions not in conflict with this amendment are still in effect and are to be performed at the level specified in the contract.

This amendment and all its attachments are hereby made a part of the contract.

IN WITNESS THEREOF, the parties hereto have caused this 11 page amendment with 4 page exhibit to be executed by their officials thereunto duly authorized.

STATE OF FLORIDA
DEPARTMENT OF
HEALTH

PROVIDER: Hazen and Sawyer, P.C.

SIGNED

BY: _____



NAME: Damann L. Anderson

TITLE: Vice President

DATE: _____

1/3/2012

FEDERAL ID NUMBER:

13-2904652

SIGNED

BY: _____



NAME: Steven Harris, M.D., M.Sc.

TITLE: Deputy Secretary of Health

DATE: _____

5 January 2012

TASK NO.	Task	Per Deliverable Subtotal	No. of Deliverables			Total Cost			
			PH1	PH2	PH3	PH1	PH2	PH3	Total
A	Task A: Technology Selection & Prioritization					\$352,144	\$336,514	\$35,480	\$724,138
A.1	Draft Literature Review Report	\$ 13,796.00	1	0	0	\$13,796	\$0	\$0	\$13,796
A.2	Final Literature Review Report	\$ 6,092.00	1	0	0	\$6,092	\$0	\$0	\$6,092
A.3	Draft Classification of Technologies Report	\$ 12,830.60	1	0	0	\$12,831	\$0	\$0	\$12,831
A.4	Draft Technology Ranking Criteria Report	\$ 10,096.00	1	0	0	\$10,096	\$0	\$0	\$10,096
A.5	Draft Priority List for Testing Report	\$ 14,858.60	1	0	0	\$14,859	\$0	\$0	\$14,859
A.6	Technology Classification, Ranking and Prioritization Workshop	\$ 18,242.60	1	0	0	\$18,243	\$0	\$0	\$18,243
A.7	Final Classification of Technologies Report	\$ 5,044.00	1	0	0	\$5,044	\$0	\$0	\$5,044
A.8	Final Technology Ranking Criteria Report	\$ 7,944.00	1	0	0	\$7,944	\$0	\$0	\$7,944
A.9	Final Priority List for Testing Report	\$ 7,786.60	1	0	0	\$7,787	\$0	\$0	\$7,787
A.10	Draft Innovative Systems Applications Report (per technology)	\$ 11,655.00	0	1	0	\$0	\$11,655	\$0	\$11,655
A.11	Final Innovative Systems Applications Report (per technology)	\$ 9,219.00	0	1	0	\$0	\$9,219	\$0	\$9,219
A.12	Identification of Test Facility Sites (per site agreement)	\$ 2,538.25	2	0	0	\$5,077	\$0	\$0	\$5,077
A.13	Draft PNRS II QAPP	\$ 13,170.50	1	0	0	\$13,171	\$0	\$0	\$13,171
A.14	Recommendation for Process Forward (per meeting)	\$ 6,236.50	1	0	0	\$6,237	\$0	\$0	\$6,237
A.15	Final PNRS II QAPP	\$ 4,496.00	1	0	0	\$4,496	\$0	\$0	\$4,496
A.16	Materials Testing for FDOH Additives Rule	\$ 4,000.00	2	2	0	\$8,000	\$8,000	\$0	\$16,000
A.17	PNRS Specification Reports	\$ 18,715.00	1	1	0	\$18,715	\$18,715	\$0	\$37,430
A.18	PNRS II Test Facility Design 50%	\$ 11,721.48	1	0	0	\$11,721	\$0	\$0	\$11,721
A.19	PNRS II Test Facility Design 100%	\$ 16,200.50	1	0	0	\$16,201	\$0	\$0	\$16,201
A.20	PNRS II Test Facility Construction Support and Administration (2 deliverables, 50% at start, 50% at completion)	\$ 16,601.00	2	0	0	\$33,202	\$0	\$0	\$33,202
A.21	PNRS II Test Facility Construction 50% (2 deliverables, start and 50% complete)	\$ 25,000.00	2	0	0	\$50,000	\$0	\$0	\$50,000
A.22	PNRS II Test Facility Construction 100% (cost reimbursable)	\$ 40,000.00	1	0	0	\$40,000	\$0	\$0	\$40,000
A.23	PNRS II Test Facility Construction Substantial Completion	\$ 10,000.00	1	0	0	\$10,000	\$0	\$0	\$10,000
A.24	PNRS II Test Facility Accept Construction	\$ 9,650.00	1	0	0	\$9,650	\$0	\$0	\$9,650
A.25	Monitoring and Sample Event Reports (per sample event)	\$ 28,985.00	1	6	0	\$28,985	\$173,910	\$0	\$202,895

A.26	Data Summary Report (per sample event)	\$ 3,365.00	0	7	0	\$0	\$23,555	\$0	\$23,555
A.27	Draft PNRS II Report	\$ 34,220.00	0	1	0	\$0	\$34,220	\$0	\$34,220
A.28	Final PNRS II Report	\$ 17,240.00	0	1	0	\$0	\$17,240	\$0	\$17,240
A.29	Draft Task A Final Report	\$ 26,000.00	0	0	1	\$0	\$0	\$26,000	\$26,000
A.30	Task A Final Report	\$ 9,480.00	0	0	1	\$0	\$0	\$9,480	\$9,480
A.31	Change-order Allowance	\$ 40,000.00	0	1	0	\$0	\$40,000	\$0	\$40,000
B	Task B: Field Testing of Technologies					\$50,202	\$599,610	\$529,243	\$1,179,054
B.1	Identification of Home Sites (per homeowner agreement)	\$ 9,341.67	1	9	0	\$9,342	\$84,075	\$0	\$93,417
B.2	Vendor Agreement Report (per vendor agreement)	\$ 7,580.00	2	0	0	\$15,160	\$0	\$0	\$15,160
B.3	Draft QAPP for Field Testing	\$ 25,700.00	1	0	0	\$25,700	\$0	\$0	\$25,700
B.4	Recommendation for Process Forward (per meeting)	\$ 6,780.00	0	1	0	\$0	\$6,780	\$0	\$6,780
B.5	Final QAPP Field Testing	\$ 11,060.00	0	1	0	\$0	\$11,060	\$0	\$11,060
B.6	Field Systems Installation Report (per system)	\$ 37,900.00	0	4	3	\$0	\$151,600	\$113,700	\$265,300
B.7	Field Systems Monitoring Report (per system, per event)	\$ 8,402.33	0	32	24	\$0	\$268,875	\$201,656	\$470,531
B.8	Field Systems Operation, Maintenance and Repairs Report (per system)	\$ 8,630.00	0	0	7	\$0	\$0	\$60,410	\$60,410
B.9	Technical Description of Nitrogen Reduction Technology Report	\$ 17,271.00	0	0	1	\$0	\$0	\$17,271	\$17,271
B.10	Acceptance of System by Owner Report (per system)	\$ 4,758.00	0	0	7	\$0	\$0	\$33,306	\$33,306
B.11	LCCA Template Report (draft template and user guidelines)	\$ 18,140.00	0	1	0	\$0	\$18,140	\$0	\$18,140
B.12	LCCA Template Report (final template and user guidelines)	\$ 9,080.00	0	1	0	\$0	\$9,080	\$0	\$9,080
B.13	LCCA Report (per system)	\$ 5,040.00	0	0	7	\$0	\$0	\$35,280	\$35,280
B.14	Draft Task B Final Report	\$ 45,120.00	0	0	1	\$0	\$0	\$45,120	\$45,120
B.15	Task B Final Report	\$ 22,500.00	0	0	1	\$0	\$0	\$22,500	\$22,500
B.16	Change-order Allowance	\$ 50,000.00	0	1	0	\$0	\$50,000	\$0	\$50,000
C	Task C: Evaluation of Nitrogen Reduction by Soils & Shallow GW					\$216,164	\$1,095,977	\$598,860	\$1,911,001
C.1	Draft Literature Review on Nitrogen Reduction in Soil Report	\$ 11,300.00	1	0	0	\$11,300	\$0	\$0	\$11,300
C.2	Final Literature Review on Nitrogen Reduction in Soil Report	\$ 6,900.00	1	0	0	\$6,900	\$0	\$0	\$6,900
C.3	Draft QAPP Evaluation of N Reduction by Soils & Shallow GW	\$ 38,939.50	1	0	0	\$38,940	\$0	\$0	\$38,940
C.4	Recommendation for Process Forward (per meeting)	\$ 5,906.50	1	0	0	\$5,907	\$0	\$0	\$5,907
C.5	Final QAPP Evaluation of N Reduction by Soils & Shallow GW	\$ 9,189.73	1	0	0	\$9,190	\$0	\$0	\$9,190
C.6	S&GW Test Facility Design 50%	\$ 26,470.50	1	0	0	\$26,471	\$0	\$0	\$26,471
C.7	S&GW Test Facility Design 100%	\$ 26,570.50	1	0	0	\$26,571	\$0	\$0	\$26,571

C.8	S&GW Test Facility Design Final	\$ 21,207.00	1	0	0	\$21,207	\$0	\$0	\$21,207
C.9	S&GW Construction Support & Administration (2 deliverables, 50% at start, 50% at completion)	\$ 13,560.00	0	2	0	\$0	\$27,120	\$0	\$27,120
C.10	S&GW Test Facility Construction 50% (2 deliverables, start and 50% complete)	\$ 15,000.00	2	0	0	\$30,000	\$0	\$0	\$30,000
C.11	S&GW Test Facility Construction 100% (cost reimbursable)	\$ 40,000.00	0	1	0	\$0	\$40,000	\$0	\$40,000
C.12	S&GW Test Facility Construction Substantial Completion	\$ 3,680.00	0	1	0	\$0	\$3,680	\$0	\$3,680
C.13	S&GW Test Facility Accept Construction	\$ 7,480.00	0	1	0	\$0	\$7,480	\$0	\$7,480
C.14	Soils & Hydrogeologic and Monitoring Plan for S&GW Test Facility	\$ 43,074.00	0	1	0	\$0	\$43,074	\$0	\$43,074
C.15	Tracer Testing at GCREC (per tracer test)	\$ 18,910.00	0	3	0	\$0	\$56,730	\$0	\$56,730
C.16	S&GW Sample Event Reports (per sample event)	\$ 47,523.28	0	3	3	\$0	\$142,570	\$142,570	\$285,140
C.17	S&GW Data Summary Report (per sample event)	\$ 13,240.00	0	3	3	\$0	\$39,720	\$39,720	\$79,440
C.18	Test Facility Closeout Report	\$ 13,080.00	0	0	1	\$0	\$0	\$13,080	\$13,080
C.19	Field Site Selection (per property owner agreement)	\$ 9,932.67	1	6	0	\$9,933	\$59,596	\$0	\$69,529
C.20	Instrumentation of GCREC Mound System	\$ 59,495.00	0.5	0.5	0	\$29,748	\$29,748	\$0	\$59,495
C.21	GCREC Mound Sample Event Report (per sampling event)	\$ 38,290.00	0	4	0	\$0	\$153,160	\$0	\$153,160
C.22	GCREC Mound Data Summary Report (per sampling event)	\$ 8,160.00	0	4	0	\$0	\$32,640	\$0	\$32,640
C.23	Instrumentation of Remaining Field Sites Report (per site)	\$ 43,075.00	0	4	0	\$0	\$172,300	\$0	\$172,300
C.24	Field Sites Sample Event Reports (per sample event, per site)	\$ 36,520.00	0	6	7	\$0	\$219,120	\$255,640	\$474,760
C.25	Field Sites Data Summary Report (per sample event, per site)	\$ 4,840.00	0	6	7	\$0	\$29,040	\$33,880	\$62,920
C.26	Draft Site Summary and Close-out Memo (per site)	\$ 8,680.00	0	0	5	\$0	\$0	\$43,400	\$43,400
C.27	Final Site Close-Out Memo (per site)	\$ 2,670.00	0	0	5	\$0	\$0	\$13,350	\$13,350
C.28	Draft Task C Final Report	\$ 40,040.00	0	0	1	\$0	\$0	\$40,040	\$40,040
C.29	Task C Final Report	\$ 17,180.00	0	0	1	\$0	\$0	\$17,180	\$17,180
C.30	Change-order Allowance	\$ 40,000.00	0	1	0	\$0	\$40,000	\$0	\$40,000
D	Task D: Nitrogen Fate and Transport Models					\$74,357	\$292,021	\$441,644	\$808,023
D.1	Draft Literature Review on Nitrogen Fate & Transport Model Report	\$ 15,533.23	1	0	0	\$15,533	\$0	\$0	\$15,533
D.2	Final Literature Review on Nitrogen Fate & Transport Model Report	\$ 5,211.08	1	0	0	\$5,211	\$0	\$0	\$5,211
D.3	Selection of Existing Data Set for Calibration Report	\$ 15,092.20	1	0	0	\$15,092	\$0	\$0	\$15,092
D.4	Draft QAPP N Fate and Transport Models	\$ 32,186.76	1	0	0	\$32,187	\$0	\$0	\$32,187
D.5	Recommendation for Process Forward (per meeting)	\$ 6,334.00	1	0	0	\$6,334	\$0	\$0	\$6,334
D.6	Final QAPP N Fate and Transport Models	\$ 15,657.38	0	1	0	\$0	\$15,657	\$0	\$15,657

D.7	Simple Soil Tools	\$ 52,448.00	0	1	0	\$0	\$52,448	\$0	\$52,448
D.8	Complex Soil Model	\$ 86,641.00	0	1	0	\$0	\$86,641	\$0	\$86,641
D.9	Complex Soil Model Performance Evaluation	\$ 48,577.00	0	1	0	\$0	\$48,577	\$0	\$48,577
D.10	Validate/Refine Complex Soil Model	\$ 72,132.04	0	1	0	\$0	\$72,132	\$0	\$72,132
D.11	Aquifer Model Combined with Complex Soil Model Development	\$ 113,411.22	0	0	1	\$0	\$0	\$113,411	\$113,411
D.12	Aquifer-Complex Soil Model Performance Evaluation	\$ 127,922.99	0	0	1	\$0	\$0	\$127,923	\$127,923
D.13	Validate/Refine Aquifer-Complex Soil Model with Data Collection from Task C	\$ 95,733.70	0	0	1	\$0	\$0	\$95,734	\$95,734
D.14	Development of Aquifer-Complex Soil Model for Multiple Spatial Inputs	\$ 25,371.84	0	0	1	\$0	\$0	\$25,372	\$25,372
D.15	Decision-Making Framework Considering Uncertainty	\$ 52,638.54	0	0	1	\$0	\$0	\$52,639	\$52,639
D.16	Task D Guidance Manual (Draft)	\$ 20,590.63	0	0.5	0.5	\$0	\$10,295	\$10,295	\$20,591
D.17	Task D Guidance Manual (Final)	\$ 12,541.41	0	0.5	0.5	\$0	\$6,271	\$6,271	\$12,541
D.18	Change-order Allowance	\$ 10,000.00	0	0	1	\$0	\$0	\$10,000	\$10,000
E	Task E: Project Management, Coordination, and Meetings					\$90,695	\$109,003	\$178,085	\$377,782
E.1	Project Kick-Off Meeting (conference call)	\$ 7,724.00	1	0	0	\$7,724	\$0	\$0	\$7,724
E.2	PM-Project Progress Reports (per bimonthly report)	\$ 9,298.00	6	8	8	\$55,788	\$74,384	\$74,384	\$204,556
E.3	RRAC or TRAP Presentation (per meeting)	\$ 11,732.25	2	2	4	\$23,465	\$23,465	\$46,929	\$93,858
E.4	RRAC or TRAP Meeting Attendance (per meeting)	\$ 3,718.05	1	3	4	\$3,718	\$11,154	\$14,872	\$29,744
E.5	PAC Meetings (per meeting)	\$ 41,900.00	0	0	1	\$0	\$0	\$41,900	\$41,900
F	Task F: Other								
PROJECT TOTALS						\$783,562	\$2,433,125	\$1,783,312	\$4,999,998

SECTION 3 – HUMAN SERVICES

512 SPECIAL CATEGORIES

CONTRACTED SERVICES

FROM GENERAL REVENUE FUND	2,047,489
FROM ADMINISTRATIVE TRUST FUND	335,165
FROM FEDERAL GRANTS TRUST FUND	643,776
FROM GRANTS AND DONATIONS TRUST FUND	676,038
FROM RADIATION PROTECTION TRUST FUND	150,000

From the funds in Specific Appropriation 512, \$1,500,000 in nonrecurring funds from the General Revenue Fund is provided to the department to complete phase II and phase III of the study authorized in Specific Appropriation 1682 of chapter 2008-152, Laws of Florida. The funds will be spent for installing field systems and sampling, installing and sampling the soil and groundwater at various sites throughout Florida to determine how nitrogen moves, and developing various models to show how nitrogen is affected by treatment in Florida-specific soils. The department shall submit a status report before October 1, 2012, a subsequent status report before February 1, 2013, and a final report upon completion of phase III to the Governor, the President of the Senate, and the Speaker of the House of Representatives prior to proceeding with any nitrogen reduction activities.

Section 5. (1) In order to implement Specific Appropriation 512 of the 2012-2013 General Appropriations Act, and for the 2012-2013 fiscal year only, the following requirements govern the completion of Phase 2 and Phase 3 of the Department of Health's Florida Onsite Sewage Nitrogen Reduction Strategies Study:

(a) The Department of Health's underlying contract for the study remains in full force and effect and funding for completion of Phase 2 and Phase 3 is through the Department of Health.

(b) The Department of Health, the Department of Health's Research Review and Advisory Committee, and the Department of Environmental Protection shall work together to provide the necessary technical oversight of the completion of Phase 2 and Phase 3 of the project.

(c) Management and oversight of the completion of Phase 2 and Phase 3 must be consistent with the terms of the existing contract. However, the main focus and priority to be completed during Phase 3 shall be developing, testing, and recommending cost-effective passive technology design criteria for nitrogen reduction.

(d) The systems installed at homesites are experimental in nature and shall be installed with significant field testing and monitoring. The Department of Health is specifically authorized to allow installation of these experimental systems. Notwithstanding any other law, before Phase 3 of the study is completed, a state agency may not adopt or implement a rule or policy that:

1. Mandates, establishes, or implements more restrictive nitrogen-reduction standards to existing or new onsite sewage treatment systems or modification of such systems; or

2. Directly or indirectly requires the use of performance-based treatment systems or similar technology, such as through an administrative order developed by the Department of Environmental Protection as part of a basin management action plan adopted pursuant to s. 403.067, Florida Statutes.

However, the implementation of more restrictive nitrogen-reduction standards for onsite systems may be required through a basin management action plan if such plan is phased in after completion of Phase 3.

(2) This section expires July 1, 2013.



**2012 PROGRESS REPORT ON PHASE II AND PHASE III OF
THE FLORIDA ONSITE SEWAGE NITROGEN REDUCTION
STRATEGIES STUDY**

Bureau of Onsite Sewage Programs

May 16, 2012

Steven L. Harris, M.D., M.Sc.
Interim State Surgeon General

Rick Scott
Governor

**Deleted: H. Frank Farmer, Jr., M.D.,
Ph.D., F.A.C.P.**

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**PROGRESS REPORT ON PHASE II AND PHASE III OF THE FLORIDA
ONSITE SEWAGE NITROGEN REDUCTION STRATEGIES STUDY**

EXECUTIVE SUMMARY

This report is submitted in compliance with Line Item 465 Section 3, Conference Report on Senate Bill 2000, General Appropriations Act for Fiscal Year 2011-2012. The Florida Legislature has provided a total of \$2.9 million (cash) for Phases I and II of a three phase project with a total estimated cost of \$5.1 million. This project is to develop cost-effective, passive strategies for nitrogen reduction for onsite sewage treatment and disposal systems (OSTDS). This project will require additional cash and budget authority in the amount of \$2.2 million to complete the study. The 2012 Florida Legislature has approved funding in the amount of \$1.5 million for the first part of Phase III, which is pending the Governor's action.

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This project is in its third of five years and is on schedule and within budget. Funds appropriated and expended to date have established necessary viable protocols and have been appropriately used to test, calibrate, and refine technologies and strategies to be tested in the field. Continued funding for the final Phase III of the project, is necessary for extensive field testing to occur. Field testing is crucial, so that the project will yield results that can be used to develop viable, cost-effective alternative passive technologies for use by homeowners for nitrogen issues associated with onsite systems.

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Regardless of the source, excessive nitrogen has negative effects on public health and the environment. This project has been endorsed by Florida TaxWatch as a good use of public funds (Wenner 2008). The Department's Research Review and Advisory Committee (RRAC) supports concluding this study as originally scoped. The tasks associated with the final phase include: continuation and completion of field monitoring of the performance and cost of technologies at home sites and of nitrogen fate and transport in the shallow groundwater; development of nitrogen fate and transport models that will be calibrated with the field sampling results; and final reporting on all tasks with recommendations on onsite sewage nitrogen reduction strategies.

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During the 2012-2013 fiscal year efforts will be focused on installing, monitoring, and modeling various field sites at locations throughout the State of Florida to evaluate nitrogen reducing technologies and to gather information on how nitrogen moves through the soil and shallow groundwater. The final phase of funding, which will be required for the 2013-2014 fiscal year, will include completion of remaining field monitoring; completion of nitrogen fate and transport models that will be calibrated with the field sampling results; and final reporting on all tasks with recommendations on onsite sewage nitrogen reduction strategies.

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The Research Review and Advisory Committee recommends that the Legislature:

1. During the 2013 legislative session, provide additional cash in the amount of \$700,000 for continuation and completion of the tasks associated with this legislatively mandated study.
2. Provide budget authority to DOH in the amount of \$700,000 for the fiscal year 2013-2014 for completion of the tasks associated with this legislatively mandated study.

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Continued support for this project will ultimately benefit Florida's approximately 2.7 million onsite system owners by finding cost-effective nitrogen reduction strategies that will improve environmental and public health protection. When fully funded, the results of this project will assist with producing nitrogen reducing systems that protect groundwater through reduced life-cycle costs and lower energy demands.

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1 INTRODUCTION

The Florida Legislature has provided a total of \$2.9 million (cash) for Phases I and II of a three phase project with a total estimated cost of \$5.1 million (Table 1). This project is to develop passive strategies for nitrogen reduction for onsite sewage treatment and disposal systems (OSTDS). This includes an initial appropriation of \$900,000 by the 2008 Legislature for the first phase of this study and an appropriation of \$2,000,000 by the 2010 Legislature for the second phase of this study. This project will require additional cash and budget authority in the amount of \$2.2 million to complete the study. The 2012 Florida Legislature has approved funding in the amount of \$1.5 million for the first part of Phase III, which is pending the Governor's approval. This report is submitted in compliance with Line Item 465 Section 3, Conference Report on Senate Bill 2000, General Appropriations Act for Fiscal Year 2011-2012, which appropriated the funding for the study.

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Table 1. Summary of Legislative Funding

Total Project Budget	\$5,100,000
Total Year To Date Funding	\$2,900,000
Balance	\$2,200,000
2012 Legislative Funding*	\$1,500,000
Projected Funding Need	\$700,000

*Pending approval by the Governor

This study was based on budget language in 2008 (Line Item 1682, House Bill 5001, General Appropriations Act for Fiscal Year 2008-2009) that instructed:

...the Department of Health to further develop cost-effective nitrogen reduction strategies. The Department of Health shall contract, by request for proposal, for Phase I of an anticipated 3-year project to develop passive strategies for nitrogen reduction that complement use of conventional onsite wastewater treatment systems. The project shall be controlled by the Department of Health's Research Review and Advisory Committee and shall include the following components: 1) comprehensive review of existing or ongoing studies on passive technologies; 2) field testing of nitrogen reducing technologies at actual home sites for comparison of conventional, passive technologies and performance-based treatment systems to determine nitrogen reduction performance; 3) documentation of all capital, energy and life-cycle costs of various technologies for nitrogen reduction; 4) evaluation of nitrogen reduction provided by soils and the shallow groundwater below and down gradient of various systems; and 5) development of a simple model for predicting nitrogen fate and transport from onsite wastewater systems. A progress report shall be presented to the Executive Office of the Governor, the President of the Senate and the Speaker of the House of Representatives on February 1, 2009, including recommendations for funding additional phases of the study.

The 2010 legislative direction (included in Appendix A) specified that the existing contract for this project will remain in full force; that the Department, the Department's Research Review and Advisory Committee (RRAC), and the Florida Department of Environmental Protection (DEP) shall work together to provide technical oversight; that DEP will have maximum technical input; that the main focus and priority for work in Phase II shall be in developing, testing, and recommending cost-effective passive technologies for nitrogen reduction; that field installations for this project will be subject to significant testing and monitoring; and that no state agency shall implement any rule or policy that requires nitrogen reducing systems or increases their costs until the study is complete.

The 2011 legislative direction (included in Appendix B) specified that the existing contract for this project will remain in full force; that the Department, the Department's Research Review and Advisory Committee (RRAC), and the Florida Department of Environmental Protection (DEP) shall work together to provide technical oversight; that completion of Phase II and Phase III must be consistent with the terms of the existing contract; that the main focus and priority for Phase III be developing, testing, and recommending cost-effective passive technology design criteria for nitrogen reduction; the installed systems are experimental in nature and shall be installed with significant field testing and monitoring; and that no state agency shall implement any rule or policy that requires nitrogen reducing systems or increases their costs until the study is complete.

Regardless of the source, excessive nitrogen has negative effects on public health and the environment. The primary motivations for this study are the environmental impacts that the increased levels of nitrogen in water bodies can cause. Programs within DEP identify water bodies impaired by excessive nitrogen, establish targets for maximum nutrient loads, and develop management action plans to restore the water bodies. The relative impact of OSTDS on total nitrogen levels varies from watershed to watershed with estimates ranging from below five to more than 20 percent. There is widespread interest in the management of OSTDS and their nitrogen impacts. This project has been endorsed by Florida TaxWatch as a study that is a good use of public funds and that provides homeowners with cost-effective options for nitrogen reduction (email communication from Kurt Wenner to Jerry McDaniel June 2, 2008). The significance of this innovative project is that it evaluates and develops strategies to reduce nitrogen impacts from OSTDS regulated by the Florida Department of Health (DOH). The goal is to develop systems that complement the use of conventional OSTDS and are also affordable and ecologically protective with reduced engineering and installation costs that assist in sustainable development.

The study contract was awarded in January 2009 to a Project Team led by Hazen and Sawyer, P.C., and was based upon an anticipated budget of \$5 million over a 3 – 5 year project timeframe, with an additional \$100,000 budget to DOH for project management. As a result of the time required for contracting, unspent monies in fiscal year 2008-2009 were budgeted in 2009 to complete the initial tasks of the project. The contract identifies the following tasks:

Task A – Technology Evaluation for Field Testing: Review, Prioritization, and Development: This task includes literature review, technology evaluation, prioritization of technologies to be examined during field testing, and further experimentation with approaches tested in a previous DOH passive nitrogen removal study. Objectives of this task are to prioritize technologies for testing at actual home sites and to perform controlled tests at a test facility to develop design criteria for new passive nitrogen reduction systems.

Task B – Field Testing of Technologies and Cost Documentation: This task includes installation of top-ranked nitrogen reduction technologies at actual homes, with documentation of their performance and cost. Cost documentation for the systems will be broken down by permitting, design, materials and construction, and operation and maintenance.

Task C – Evaluation of Nitrogen Reduction Provided by Soils and Shallow Groundwater: This task includes several field evaluations of nitrogen reduction in Florida soils and shallow groundwater and also will provide data for the development of a simple planning model in Task D.

Task D – Nitrogen Fate and Transport Modeling: The objective of this task is to develop a simple fate and transport model of nitrogen from OSTDS that can be used for assessment, planning and siting of OSTDS.

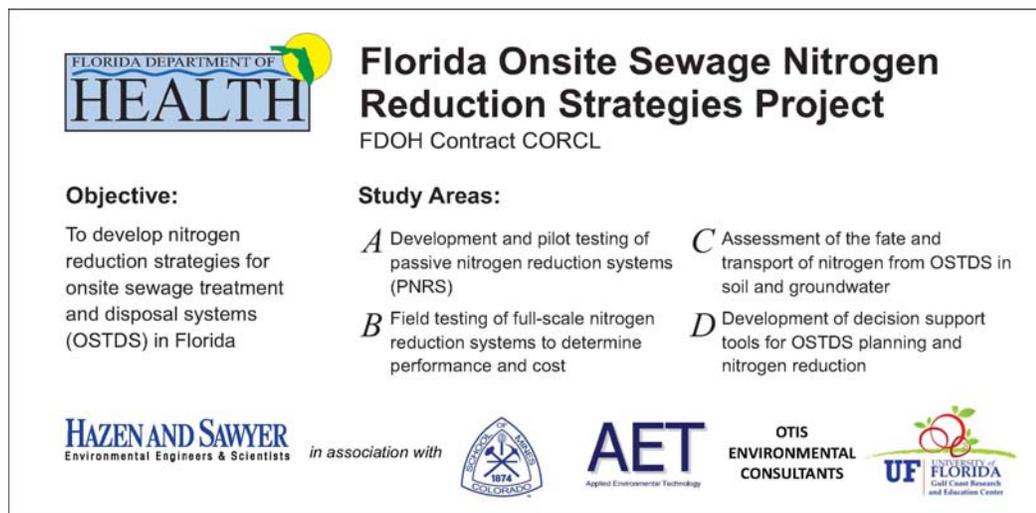


Figure 1. Sign posted at the University of Florida’s Gulf Coast Research & Education Center’s test facility.

2 PROJECT STATUS

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Funding for the first and second phases of this project has been appropriated. [The 2012 Florida Legislature has approved funding for the first part of Phase III.](#) A summary of the major project elements and their timing with funding phases is shown in Table 1. The contractor, in coordination with the RRAC and DOH, has successfully completed parts of Tasks A, B, C, and D, including literature reviews; ranking of nitrogen reduction technologies for field testing; design and construction of a test facility for further development of passive technologies; development of quality assurance documents for the test facility work, groundwater monitoring, field testing, and nitrogen fate and transport modeling; installation of a nitrogen reducing system at a home site; completion of several sampling events of passive systems at the test facility and field sites; [design and construction of a soil and groundwater test facility](#); and field sampling of the soil and groundwater under OSTDS at residential homes throughout Florida and at the test facility.



Figure 2. Test facility constructed at the University of Florida's Gulf Coast Research & Education Center.

Current efforts and work remaining for the 2011-2012 fiscal year includes: installation and field sampling of **additional** field sites at residential homes throughout Florida for the testing of passive systems and to test the soil and groundwater under OSTDS; sampling at the soil and groundwater test facility; and initiating development of a nitrogen fate and transport model. RRAC supports concluding this study as originally scoped. The following work by task will proceed with the current **and proposed** funding levels, which includes the \$1.5 million the Florida Legislature approved in 2012:

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1. The technology evaluation (Task A) included a total of 7 sample events at the passive nitrogen test facility, measuring 14 different analytes at **over 40** sampling points in 11 systems, as well as a final report on the pilot passive nitrogen removal study at the Gulf Coast Research and Education Center (GCREC).

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Current Status as of March 2012: All sample events at the test facility have been completed. Test results are encouraging after 12 months of testing, showing a reduction in total nitrogen of over 95%, with a final effluent concentration of 2.6 mg/L **or less** for several of the systems.

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2. For field testing of technologies (Task B), the quality assurance project plan has been finalized. Approximately **seven** onsite systems, utilizing various nitrogen removal technologies, will be installed at home locations throughout the State of Florida. It is anticipated that **a total of seven** field system performance monitoring events will be conducted on **each** these systems with the current funding level, measuring 16 different analytes at **2-8** different sampling points. A life cycle cost assessment template will also be completed.

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Current Status as of March 2012: Eleven homeowners residing at locations across Florida have agreed to participate in the study to date for Task B. Home sites have been identified in Wakulla County, the Wekiva area, and several other areas throughout the State. At least one of the home sites will have a gravity-fed system

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installed. Construction has been completed for one system and sampling has begun. A second system is currently in the design and permitting phase.

3. To evaluate nitrogen reduction provided by soils and shallow groundwater (Task C), a soil and groundwater test facility has been constructed to show how groundwater fate and transport of nitrogen occurs in multiple soil treatment unit regimes. Six sampling events will be completed with the current funding level, sampling six different locations at each site, and measuring multiple parameters in the effluent, soil, and groundwater. The existing OSTDS mound system at the University of Florida's Gulf Coast Research & Education Center (GCREC) in Wimauma, Florida will be instrumented to study how nitrogen behaves in the soil and groundwater. Four sampling events that examine multiple parameters have been completed at the existing OSTDS mound system at GCREC. At least three soil and groundwater monitoring events will occur at up to three home sites to evaluate nitrogen movement in the soil and groundwater in the field, measuring multiple parameters in the effluent, soil, and groundwater.

Current Status as of March 2012: Tasks that have been completed thus far are the testing of media components per 381.0065(4)(m) F.S., one tracer test to determine existing groundwater flow characteristics, and construction of the soil and groundwater test facility. Instrumentation of the existing OSTDS mound system at GCREC has been completed and four sample events have been conducted. Six homeowners have agreed to participate in the study to date for Task C. Three home sites have been selected and two have been instrumented. One sample event has occurred at the first of these sites, however, the groundwater flow direction could not be delineated, and no additional sampling events will occur at that site. Three sample events have occurred at the second instrumented site, and the third site is being instrumented for monitoring. Monitoring will be conducted at four groundwater test areas at the soil and groundwater test facility to show how groundwater fate and transport of nitrogen occurs.

4. To address nitrogen fate and transport modeling for Task D, a final quality assurance project plan has been completed, and the first steps will include the development of a soil model to show how nitrogen is affected by treatment in Florida-specific soils.

Current Status as of March 2012: Work has focused primarily on soil modeling under the current budget. Development of a soil model is underway and will be utilized to generate a simple tool for prediction of nitrogen removal in the unsaturated zone of Florida soils.

3 ANTICIPATED PROGRESS IN 2012-2014

During the 2012-2013 fiscal year, the following progress is anticipated, assuming the appropriation of \$1.5 million is approved by the Governor:

1. For Task A, analysis of the results from the passive nitrogen test facility research is underway.
2. For Task B, it is anticipated that four field sites will be installed; at least four field system performance monitoring events will be conducted on each of the seven systems; a report providing a technical description of nitrogen reduction technologies will be written, as well as a report providing a template and user guidelines for system life cycle cost assessments.
3. For Task C, three final monitoring events at the soil and groundwater test facility will be conducted, and monitoring events at three home sites will be performed to evaluate nitrogen movement in the soil and groundwater in the field.

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- For Task D, soil models demonstrating performance evaluation will be developed and refined, as well as development of model demonstrating nitrogen movement in the shallow groundwater and soil.

During the 2013-2014 fiscal year, additional funding will be critical to complete the tasks associated with the final phase. These include: continuation and completion of field monitoring of performance and cost of technologies at home sites and of nitrogen fate and transport in the shallow groundwater; calibration and refinement of various nitrogen fate and transport models that will be calibrated with the field sampling results; and final reporting on all tasks with recommendations on onsite sewage nitrogen reduction strategies. In particular, the following work will occur with the final phase of funding being requested with this report:

- For Task A, the final task report will be written. This report will include a summary of the accomplishments of the passive nitrogen removal test facility.
- For Task B, it is anticipated that one final field system performance monitoring event will be conducted on each of the seven systems; and completion of final reporting on all of the field work associated with this task. Cost documentation for the systems will be broken down by permitting, design, materials and construction, and operation and maintenance.
- For Task C, monitoring events at three home sites will be conducted to evaluate nitrogen movement in the soil and groundwater in the field. Final reporting for this task will be completed.
- For Task D, the soil model will be completed and integrated with groundwater models which will be calibrated, and validated, utilizing the results of the field work collected in previous tasks, and a final task report will be written summarizing the results of this task.

4 FUNDING NEEDS

Activities in fiscal years 2008-2012 have prepared the framework for rapid implementation of all remaining project tasks in fiscal years 2013-2014. Cash and budget authorization in the amount of \$700,000 is required to reap the benefits of all previous work and to complete the goals of this project.

This project is in its third of five years and is on schedule and within budget. Funds appropriated and expended to date have established necessary viable protocols and have been appropriately used to test, calibrate, and refine technologies and strategies to be tested in the field. Continued funding for Phase III of the project is necessary for extensive field testing (the major portion of Task B) to be completed. Field testing is crucial, so that the project will yield results that can be used to develop viable, cost-effective alternative passive technologies for use by homeowners for nitrogen issues associated with onsite systems.

Project Tasks (described previously) are broken down further into funding phases as follows:

Initial Funding in 2008-2010 (Phase I): \$900,000 (cash and budget authority) appropriated (in 2008 and 2009 state budgets) – Status: Complete. The initial funding was targeted to prioritize systems for testing, summarize existing knowledge, develop testing protocols, and establish a test facility for detailed soil and groundwater monitoring and for preliminary testing of pilot scale passive nitrogen reduction systems.

Funding in 2010-2011: \$2 million (cash and budget authority) appropriated (in 2010 state budget) – Status: Ongoing. This funding is for field monitoring over at least a one-year monitoring period of performance and cost of technologies at home sites, and of nitrogen fate

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and transport. This funding will also continue the development and monitoring work at the test facility and continue the modeling work.

Funding in 2011-2012: Although \$2.75 million in budget authorization was appropriated in the 2011 state budget, no additional cash accompanied the budget authorization – Status: Ongoing. The remaining cash from the 2010-2011 appropriation is being used to continue the monitoring of systems and the soil modeling work. The preliminary results of the project are encouraging.

Funding in 2012-2013: \$1.5 million has been approved by the Florida Legislature – Status: Funding will not be released until it has been approved by the Governor and the 2012-2013 fiscal year has begun. These funds will be used to continue to install and monitor nitrogen reducing systems, draft a life cycle cost assessment template report for systems evaluated in this study, monitor nitrogen in the groundwater under existing OSTDS, and to develop, validate, and refine the soil modeling work.

Funding in 2013-2014: To adequately fund the final phase of the project, \$700,000 cash is required to fund the completion of scheduled tasks. Further testing and analysis is required to confirm the results to date with field data and to provide data for development of the engineering specifications for full system designs. The funds will be used to complete monitoring and other field activities, perform additional testing as deemed appropriate by the Legislature, and for final reporting with recommendations on onsite sewage nitrogen reduction strategies for Florida's future.

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Further information on this project, including previous legislative reports and detailed project reports, can be found on the Department's website:

<http://www.doh.state.fl.us/environment/ostds/research/Nitrogen.html>

Table 2. Summary of Funding Phase Tasks and Progress

Task	Status	Phase I	Phase II	Phase IIIa	Phase III
A Task A: Technology Selection & Prioritization		\$352,144	\$336,514	\$0	\$35,480
Literature review	Complete				
Ranking of nitrogen reduction technologies for field testing	Complete				
Design and construction of test facility	Complete				
Quality assurance project plan	Complete				
Monitoring and sample events (7 events)	Complete				
Final test facility report	Underway				
Final task report	Funding required				
B Task B: Field Testing of Technologies		\$50,202	\$599,610	\$265,408	\$263,834
Quality assurance project plan	Complete				
Installation of ranked nitrogen reduction technologies at 7 field sites	Underway				
System performance monitoring events at 7 sites	Underway				
Lifecycle cost assessment template development	Not started				
Final life cycle cost assessment report (per system)	Funding required				
Final task report	Funding required				
C Task C: Evaluation of Nitrogen Reduction by Soils & Shallow Groundwater		\$216,164	\$1,095,977	\$436,220	\$162,640
Quality assurance project plan	Complete				
Design of test facility	Complete				
Construction of test facility	Complete				
Test facility monitoring and sample events (4 test areas sampled 6 times)	Not started, partially funded				
Instrumentation of existing OSTDS mound at GREC facility	Complete				
GREC mound sample events	Complete				
Field sites sample events (4 sites, 3 sites will be sampled 3 times, 1 site discontinued)	Underway, partially funded				
Final task report	Funding required				
D Task D: Nitrogen Fate and Transport Models		\$74,357	\$292,021	\$251,334	\$190,310
Quality assurance project plan	Complete				
Soil model development (simple and complex)	Underway				
Performance evaluation and refinement of soil models	Not started				
Shallow groundwater/soil model development	Funding required				
Performance evaluation and refinement of soil groundwater model	Funding required				
Decision making framework	Funding required				
Final task report	Funding required				
Project Management (sum of contractor and DOH)		\$119,953	\$149,003	\$105,407	\$103,422
Contractor project management	Underway	\$90,695	\$109,003	\$90,407	\$87,679
DOH project management	Underway	\$29,258	\$40,000	\$15,000	\$15,743
Total Project Budget		\$812,820	\$2,473,125	\$1,058,369	\$755,686
Total Spent as of March 18, 2012		\$812,820	\$1,109,427	\$0	\$0
Balance		\$0	\$1,363,698	\$0	\$0

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 b. DOH project management costs for Phases II and III are estimated costs. ¶
 c. Budgeted totals differ from the legislative funding amounts due to scheduling. ¶
 ¶
 d Proposed funding, yet to be funded ¶
 e Future funding, yet to be funded ¶
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DOH – Department of Health
 GREC – Gulf Coast Research & Education Center
 OSTDS – Onsite Sewage Treatment and Disposal Systems

5 RECOMMENDATIONS

The Research Review and Advisory Committee recommends that the 2013 Legislature:

1. Provide additional cash in the amount of \$700,000 for continuation and completion of the tasks associated with this legislatively mandated study.
2. Provide budget authority to DOH in the amount of \$700,000 for the fiscal year 2013-2014 for completion of the tasks associated with this legislatively mandated study.

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This additional funding will be applied to the second part of the final phase of the project, primarily continuation and completion of field monitoring of performance and cost of technologies at home sites and of nitrogen fate and transport in the shallow groundwater, calibration and refinement of various nitrogen fate and transport models that will be calibrated with the field sampling results, and final reporting on all tasks with recommendations on onsite sewage nitrogen reduction strategies.

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Continued support for this project will ultimately benefit Florida's approximately 2.7 million onsite system owners by finding cost-effective nitrogen reduction strategies that will improve environmental and public health protection. When fully funded, the results of this project will assist with producing nitrogen reducing systems that protect groundwater through reduced life-cycle costs and lower energy demands.

DRAFT

APPENDIX A. 2010 Legislative Language

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SECTION 3 – HUMAN SERVICES

486 SPECIAL CATEGORIES

CONTRACTED SERVICES

FROM GENERAL REVENUE FUND	153,772
FROM ADMINISTRATIVE TRUST FUND . . .	337,765
FROM FEDERAL GRANTS TRUST FUND . . .	348,235
FROM GRANTS AND DONATIONS TRUST FUND	2,648,438
FROM RADIATION PROTECTION TRUST FUND	150,000

From the funds in Specific Appropriation 486, \$2,000,000 from the Grants and Donations Trust Fund is provided to the department to continue phase II and complete the study authorized in Specific Appropriation 1682 of chapter 2008-152, Laws of Florida. The report shall include recommendations on passive strategies for nitrogen reduction that complement use of conventional onsite wastewater treatment systems. The department shall submit an interim report of phase II on February 1, 2011, a subsequent status report on May 16, 2011, and a final report upon completion of phase II to the Governor, the President of the Senate, and the Speaker of the House of Representatives prior to proceeding with any nitrogen reduction activities.

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Section 14. In order to implement Specific Appropriation 486 of the 2010-2011 General Appropriations Act, and for the 2010-2011 fiscal year only, the following requirements shall govern Phase 2 of the Department of Health's Florida Onsite Sewage Nitrogen Reduction Strategies Study:

(1) The underlying contract for which the study was let shall remain in full force and effect with the Department of Health and funding the contract for Phase 2 of the study shall be through the Department of Health.

(2) The Department of Health, the Department of Health's Research Review and Advisory Committee, and the Department of Environmental Protection shall work together to provide the necessary technical oversight of Phase 2 of the project, with the Department of Environmental Protection having maximum technical input.

(3) Management and oversight of Phase 2 shall be consistent with the terms of the existing contract; however, the main focus and priority for work to be completed for Phase 2 shall be in developing, testing, and recommending cost-effective passive technology design criteria for nitrogen reduction.

(4) The systems installed at actual home sites are experimental in nature and shall be installed with significant field testing and monitoring. The Department of Health is specifically authorized to allow installation of these experimental systems. In addition, before Phase 2 of the study is complete and notwithstanding any law to the contrary, a state agency may not adopt or implement a rule or policy that:

(a) Mandates, establishes, or implements any new nitrogen-reduction standards that apply to existing or new onsite sewage treatment systems or modification of such systems;

(b) Increases the cost of treatment for nitrogen reduction from onsite sewage treatment systems; or

(c) Directly requires or has the indirect effect of requiring, for nitrogen reduction, the use of performance-based treatment systems or any similar technology; provided the Department of Environmental Protection administrative orders recognizing onsite system modifications, developed

through a basin management action plan adopted pursuant to section 403.067, Florida Statutes, are not subject to the above restrictions where implementation of onsite system modifications are phased in after completion of Phase 2, except that no onsite system modification developed in a basin management action plan shall directly or indirectly require the installation of performance-based treatment systems.

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APPENDIX B. 2011 Legislative Language

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SECTION 3 – HUMAN SERVICES

465 SPECIAL CATEGORIES

CONTRACTED SERVICES

FROM GENERAL REVENUE FUND	97,489
FROM ADMINISTRATIVE TRUST FUND . . .	335,165
FROM FEDERAL GRANTS TRUST FUND . . .	643,776
FROM GRANTS AND DONATIONS TRUST FUND	3,401,038
FROM RADIATION PROTECTION TRUST FUND	150,000

From the funds in Specific Appropriation 465, \$2,725,000 in nonrecurring funds from the Grants and Donations Trust Fund is provided to the department to complete phase II and phase III and complete the study authorized in Specific Appropriation 1682 of chapter 2008-152, Laws of Florida. The report shall include recommendations on passive strategies for nitrogen reduction that complement use of conventional onsite wastewater treatment systems. The department shall submit an interim report of the completion of phase II and progress on phase III on February 1, 2012, a subsequent status report on May 16, 2012, and a final report upon completion of phase III to the Governor, the President of the Senate, and the Speaker of the House of Representatives prior to proceeding with any nitrogen reduction activities.

Section 7. In order to implement Specific Appropriation 465 of the 2011-2012 General Appropriations Act, and for the 2011-2012 fiscal year only, the following requirements govern the completion of Phase 2 and Phase 3 of the Department of Health's Florida Onsite Sewage Nitrogen Reduction Strategies Study:

(1) The Department of Health's underlying contract for the study remains in full force and effect and funding for completion of Phase 2 and Phase 3 is through the Department of Health.

(2) The Department of Health, the Department of Health's Research Review and Advisory Committee, and the Department of Environmental Protection shall work together to provide the necessary technical oversight of the completion of Phase 2 and Phase 3 of the project.

(3) Management and oversight of the completion of Phase 2 and Phase 3 must be consistent with the terms of the existing contract. However, the main focus and priority to be completed during Phase 3 shall be developing, testing, and recommending cost-effective passive technology design criteria for nitrogen reduction.

(4) The systems installed at homesites are experimental in nature and shall be installed with significant field testing and monitoring. The Department of Health is specifically authorized to allow installation of these experimental systems. Notwithstanding any other law, before Phase 3 of the study is completed, a state agency may not adopt or implement a rule or policy that:

(a) Mandates, establishes, or implements more restrictive nitrogen-reduction standards to existing or new onsite sewage treatment systems or modification of such systems; or

(b) Directly or indirectly requires the use of performance-based treatment systems or similar technology, such as through an administrative order developed by the Department of Environmental Protection as part of a basin management action plan adopted pursuant to s. 403.067, Florida Statutes. However, the implementation of more restrictive nitrogen-reduction standards for onsite systems may be required through a basin management action plan if such plan is phased in after completion of Phase 3.



**2012 PROGRESS REPORT ON PHASE II AND PHASE III OF
THE FLORIDA ONSITE SEWAGE NITROGEN REDUCTION
STRATEGIES STUDY**

Bureau of Onsite Sewage Programs

May 16, 2012

Steven L. Harris, M.D., M.Sc.
Interim State Surgeon General

Rick Scott
Governor

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PROGRESS REPORT ON PHASE II AND PHASE III OF THE FLORIDA ONSITE SEWAGE NITROGEN REDUCTION STRATEGIES STUDY

EXECUTIVE SUMMARY

This report is submitted in compliance with Line Item 465 Section 3, Conference Report on Senate Bill 2000, General Appropriations Act for Fiscal Year 2011-2012. The Florida Legislature has provided a total of \$2.9 million (cash) for Phases I and II of a three phase project with a total estimated cost of \$5.1 million. This project is to develop cost-effective, passive strategies for nitrogen reduction for onsite sewage treatment and disposal systems (OSTDS). This project will require additional cash and budget authority in the amount of \$2.2 million to complete the study. The 2012 Florida Legislature has approved funding in the amount of \$1.5 million for the first part of Phase III, which is pending the Governor's action.

This project is in its third of five years and is on schedule and within budget. Funds appropriated and expended to date have established necessary viable protocols and have been appropriately used to test, calibrate, and refine technologies and strategies to be tested in the field. Continued funding for the final Phase III of the project is necessary for extensive field testing to occur. Field testing is crucial, so that the project will yield results that can be used to develop viable, cost-effective alternative passive technologies for use by homeowners for nitrogen issues associated with onsite systems.

Regardless of the source, excessive nitrogen has negative effects on public health and the environment. This project has been endorsed by Florida TaxWatch as a good use of public funds (Wenner 2008). The Department's Research Review and Advisory Committee (RRAC) supports concluding this study as originally scoped. The tasks associated with the final phase include: continuation and completion of field monitoring of the performance and cost of technologies at home sites and of nitrogen fate and transport in the shallow groundwater; development of nitrogen fate and transport models that will be calibrated with the field sampling results; and final reporting on all tasks with recommendations on onsite sewage nitrogen reduction strategies.

During the 2012-2013 fiscal year efforts will be focused on installing, monitoring, and modeling various field sites at locations throughout the State of Florida to evaluate nitrogen reducing technologies and to gather information on how nitrogen moves through the soil and shallow groundwater. The final phase of funding, which will be required for the 2013-2014 fiscal year, will include completion of remaining field monitoring; completion of nitrogen fate and transport models that will be calibrated with the field sampling results; and final reporting on all tasks with recommendations on onsite sewage nitrogen reduction strategies.

The Research Review and Advisory Committee recommends that the Legislature:

1. During the 2013 legislative session, provide additional cash in the amount of \$700,000 for continuation and completion of the tasks associated with this legislatively mandated study.
2. Provide budget authority to DOH in the amount of \$700,000 for the fiscal year 2013-2014 for completion of the tasks associated with this legislatively mandated study.

Continued support for this project will ultimately benefit Florida's approximately 2.7 million onsite system owners by finding cost-effective nitrogen reduction strategies that will improve environmental and public health protection. When fully funded, the results of this project will assist with producing nitrogen reducing systems that protect groundwater through reduced life-cycle costs and lower energy demands.

1 INTRODUCTION

The Florida Legislature has provided a total of \$2.9 million (cash) for Phases I and II of a three phase project with a total estimated cost of \$5.1 million (Table 1). This project is to develop passive strategies for nitrogen reduction for onsite sewage treatment and disposal systems (OSTDS). This includes an initial appropriation of \$900,000 by the 2008 Legislature for the first phase of this study and an appropriation of \$2,000,000 by the 2010 Legislature for the second phase of this study. This project will require additional cash and budget authority in the amount of \$2.2 million to complete the study. The 2012 Florida Legislature has approved funding in the amount of \$1.5 million for the first part of Phase III, which is pending the Governor's approval. This report is submitted in compliance with Line Item 465 Section 3, Conference Report on Senate Bill 2000, General Appropriations Act for Fiscal Year 2011-2012, which appropriated the funding for the study.

Table 1. Summary of Legislative Funding

Total Project Budget	\$5,100,000
Total Year To Date Funding	\$2,900,000
Balance	\$2,200,000
2012 Legislative Funding*	\$1,500,000
Projected Funding Need	\$700,000

*Pending approval by the Governor

This study was based on budget language in 2008 (Line Item 1682, House Bill 5001, General Appropriations Act for Fiscal Year 2008-2009) that instructed:

...the Department of Health to further develop cost-effective nitrogen reduction strategies. The Department of Health shall contract, by request for proposal, for Phase I of an anticipated 3-year project to develop passive strategies for nitrogen reduction that complement use of conventional onsite wastewater treatment systems. The project shall be controlled by the Department of Health's Research Review and Advisory Committee and shall include the following components: 1) comprehensive review of existing or ongoing studies on passive technologies; 2) field testing of nitrogen reducing technologies at actual home sites for comparison of conventional, passive technologies and performance-based treatment systems to determine nitrogen reduction performance; 3) documentation of all capital, energy and life-cycle costs of various technologies for nitrogen reduction; 4) evaluation of nitrogen reduction provided by soils and the shallow groundwater below and down gradient of various systems; and 5) development of a simple model for predicting nitrogen fate and transport from onsite wastewater systems. A progress report shall be presented to the Executive Office of the Governor, the President of the Senate and the Speaker of the House of Representatives on February 1, 2009, including recommendations for funding additional phases of the study.

The 2010 legislative direction (included in Appendix A) specified that the existing contract for this project will remain in full force; that the Department, the Department's Research Review and Advisory Committee (RRAC), and the Florida Department of Environmental Protection (DEP) shall work together to provide technical oversight; that DEP will have maximum technical input; that the main focus and priority for work in Phase II shall be in developing, testing, and recommending cost-effective passive technologies for nitrogen reduction; that field installations for this project will be subject to significant testing and monitoring; and that no state agency shall implement any rule or policy that requires nitrogen reducing systems or increases their costs until the study is complete.

The 2011 legislative direction (included in Appendix B) specified that the existing contract for this project will remain in full force; that the Department, the Department's Research Review and Advisory Committee (RRAC), and the Florida Department of Environmental Protection (DEP) shall work together to provide technical oversight; that completion of Phase II and Phase III must be consistent with the terms of the existing contract; that the main focus and priority for Phase III be developing, testing, and recommending cost-effective passive technology design criteria for nitrogen reduction; the installed systems are experimental in nature and shall be installed with significant field testing and monitoring; and that no state agency shall implement any rule or policy that requires nitrogen reducing systems or increases their costs until the study is complete.

Regardless of the source, excessive nitrogen has negative effects on public health and the environment. The primary motivations for this study are the environmental impacts that the increased levels of nitrogen in water bodies can cause. Programs within DEP identify water bodies impaired by excessive nitrogen, establish targets for maximum nutrient loads, and develop management action plans to restore the water bodies. The relative impact of OSTDS on total nitrogen levels varies from watershed to watershed with estimates ranging from below five to more than 20 percent. There is widespread interest in the management of OSTDS and their nitrogen impacts. This project has been endorsed by Florida TaxWatch as a study that is a good use of public funds and that provides homeowners with cost-effective options for nitrogen reduction (email communication from Kurt Wenner to Jerry McDaniel June 2, 2008). The significance of this innovative project is that it evaluates and develops strategies to reduce nitrogen impacts from OSTDS regulated by the Florida Department of Health (DOH). The goal is to develop systems that complement the use of conventional OSTDS and are also affordable and ecologically protective with reduced engineering and installation costs that assist in sustainable development.

The study contract was awarded in January 2009 to a Project Team led by Hazen and Sawyer, P.C., and was based upon an anticipated budget of \$5 million over a 3 – 5 year project timeframe, with an additional \$100,000 budget to DOH for project management. As a result of the time required for contracting, unspent monies in fiscal year 2008-2009 were budgeted in 2009 to complete the initial tasks of the project. The contract identifies the following tasks:

Task A – Technology Evaluation for Field Testing: Review, Prioritization, and Development: This task includes literature review, technology evaluation, prioritization of technologies to be examined during field testing, and further experimentation with approaches tested in a previous DOH passive nitrogen removal study. Objectives of this task are to prioritize technologies for testing at actual home sites and to perform controlled tests at a test facility to develop design criteria for new passive nitrogen reduction systems.

Task B – Field Testing of Technologies and Cost Documentation: This task includes installation of top-ranked nitrogen reduction technologies at actual homes, with documentation of their performance and cost. Cost documentation for the systems will be broken down by permitting, design, materials and construction, and operation and maintenance.

Task C – Evaluation of Nitrogen Reduction Provided by Soils and Shallow Groundwater: This task includes several field evaluations of nitrogen reduction in Florida soils and shallow groundwater and also will provide data for the development of a simple planning model in Task D.

Task D – Nitrogen Fate and Transport Modeling: The objective of this task is to develop a simple fate and transport model of nitrogen from OSTDS that can be used for assessment, planning and siting of OSTDS.

FLORIDA DEPARTMENT OF HEALTH

Florida Onsite Sewage Nitrogen Reduction Strategies Project

FDOH Contract CORCL

Objective:
To develop nitrogen reduction strategies for onsite sewage treatment and disposal systems (OSTDS) in Florida

Study Areas:

- A** Development and pilot testing of passive nitrogen reduction systems (PNRS)
- B** Field testing of full-scale nitrogen reduction systems to determine performance and cost
- C** Assessment of the fate and transport of nitrogen from OSTDS in soil and groundwater
- D** Development of decision support tools for OSTDS planning and nitrogen reduction

HAZEN AND SAWYER
Environmental Engineers & Scientists *in association with*

AET
Applied Environmental Technology

OTIS ENVIRONMENTAL CONSULTANTS

UF UNIVERSITY OF FLORIDA
Gulf Coast Research and Education Center

Figure 1. Sign posted at the University of Florida’s Gulf Coast Research & Education Center’s test facility.

2 PROJECT STATUS

Funding for the first and second phases of this project has been appropriated. The 2012 Florida Legislature has approved funding for the first part of Phase III. A summary of the major project elements and their timing with funding phases is shown in Table 1. The contractor, in coordination with the RRAC and DOH, has successfully completed parts of Tasks A, B, C, and D, including literature reviews; ranking of nitrogen reduction technologies for field testing; design and construction of a test facility for further development of passive technologies; development of quality assurance documents for the test facility work, groundwater monitoring, field testing, and nitrogen fate and transport modeling; installation of a nitrogen reducing system at a home site; completion of several sampling events of passive systems at the test facility and field sites; design and construction of a soil and groundwater test facility; and field sampling of the soil and groundwater under OSTDS at residential homes throughout Florida and at the test facility.



Figure 2. Test facility constructed at the University of Florida's Gulf Coast Research & Education Center.

Current efforts and work remaining for the 2011-2012 fiscal year includes: installation and field sampling of additional field sites at residential homes throughout Florida for the testing of passive systems and to test the soil and groundwater under OSTDS; sampling at the soil and groundwater test facility; and initiating development of a nitrogen fate and transport model. RRAC supports concluding this study as originally scoped. The following work by task will proceed with the current and proposed funding levels, which includes the \$1.5 million the Florida Legislature approved in 2012:

1. The technology evaluation (Task A) included a total of 7 sample events at the passive nitrogen test facility, measuring 14 different analytes at over 40 sampling points in 11 systems, as well as a final report on the pilot passive nitrogen removal study at the Gulf Coast Research and Education Center (GCREC).
Current Status as of March 2012: All sample events at the test facility have been completed. Test results are encouraging after 12 months of testing, showing a reduction in total nitrogen of over 95%, with a final effluent concentration of 2.6 mg/L or less for several of the systems.
2. For field testing of technologies (Task B), the quality assurance project plan has been finalized. Approximately seven onsite systems, utilizing various nitrogen removal technologies, will be installed at home locations throughout the State of Florida. It is anticipated that a total of seven field system performance monitoring events will be conducted on each these systems with the current funding level, measuring 16 different analytes at 2-8 different sampling points. A life cycle cost assessment template will also be completed.
Current Status as of March 2012: Eleven homeowners residing at locations across Florida have agreed to participate in the study to date for Task B. Home sites have been identified in Wakulla County, the Wekiva area, and several other areas throughout the State. At least one of the home sites will have a gravity-fed system

- installed. Construction has been completed for one system and sampling has begun. A second system is currently in the design and permitting phase.
3. To evaluate nitrogen reduction provided by soils and shallow groundwater (Task C), a soil and groundwater test facility has been constructed to show how groundwater fate and transport of nitrogen occurs in multiple soil treatment unit regimes. Six sampling events will be completed with the current funding level, sampling six different locations at each site, and measuring multiple parameters in the effluent, soil, and groundwater. The existing OSTDS mound system at the University of Florida's Gulf Coast Research & Education Center (GCREC) in Wimauma, Florida will be instrumented to study how nitrogen behaves in the soil and groundwater. Four sampling events that examine multiple parameters have been completed at the existing OSTDS mound system at GCREC. At least three soil and groundwater monitoring events will occur at up to three home sites to evaluate nitrogen movement in the soil and groundwater in the field, measuring multiple parameters in the effluent, soil, and groundwater.

Current Status as of March 2012: Tasks that have been completed thus far are the testing of media components per 381.0065(4)(m) F.S., one tracer test to determine existing groundwater flow characteristics, and construction of the soil and groundwater test facility. Instrumentation of the existing OSTDS mound system at GCREC has been completed and four sample events have been conducted. Six homeowners have agreed to participate in the study to date for Task C. Three home sites have been selected and two have been instrumented. One sample event has occurred at the first of these sites, however, the groundwater flow direction could not be delineated, and no additional sampling events will occur at that site. Three sample events have occurred at the second instrumented site, and the third site is being instrumented for monitoring. Monitoring will be conducted at four groundwater test areas at the soil and groundwater test facility to show how groundwater fate and transport of nitrogen occurs.

4. To address nitrogen fate and transport modeling for Task D, a final quality assurance project plan has been completed, and the first steps will include the development of a soil model to show how nitrogen is affected by treatment in Florida-specific soils.
Current Status as of March 2012: Work has focused primarily on soil modeling under the current budget. Development of a soil model is underway and will be utilized to generate a simple tool for prediction of nitrogen removal in the unsaturated zone of Florida soils.

3 ANTICIPATED PROGRESS IN 2012-2014

During the 2012-2013 fiscal year, the following progress is anticipated, assuming the appropriation of \$1.5 million is approved by the Governor:

1. For Task A, analysis of the results from the passive nitrogen test facility research is underway.
2. For Task B, it is anticipated that four field sites will be installed; at least four field system performance monitoring events will be conducted on each of the seven systems; a report providing a technical description of nitrogen reduction technologies will be written, as well as a report providing a template and user guidelines for system life cycle cost assessments.
3. For Task C, three final monitoring events at the soil and groundwater test facility will be conducted, and monitoring events at three home sites will be performed to evaluate nitrogen movement in the soil and groundwater in the field.

4. For Task D, soil models demonstrating performance evaluation will be developed and refined, as well as development of model demonstrating nitrogen movement in the shallow groundwater and soil.

During the 2013-2014 fiscal year, additional funding will be critical to complete the tasks associated with the final phase. These include: continuation and completion of field monitoring of performance and cost of technologies at home sites and of nitrogen fate and transport in the shallow groundwater; calibration and refinement of various nitrogen fate and transport models that will be calibrated with the field sampling results; and final reporting on all tasks with recommendations on onsite sewage nitrogen reduction strategies. In particular, the following work will occur with the final phase of funding being requested with this report:

1. For Task A, the final task report will be written. This report will include a summary of the accomplishments of the passive nitrogen removal test facility.
2. For Task B, it is anticipated that one final field system performance monitoring event will be conducted on each of the seven systems; and completion of final reporting on all of the field work associated with this task. Cost documentation for the systems will be broken down by permitting, design, materials and construction, and operation and maintenance.
3. For Task C, monitoring events at three home sites will be conducted to evaluate nitrogen movement in the soil and groundwater in the field. Final reporting for this task will be completed.
4. For Task D, the soil model will be completed and integrated with groundwater models which will be calibrated, and validated, utilizing the results of the field work collected in previous tasks, and a final task report will be written summarizing the results of this task.

4 FUNDING NEEDS

Activities in fiscal years 2008-2012 have prepared the framework for rapid implementation of all remaining project tasks in fiscal years 2013-2014. Cash and budget authorization in the amount of \$700,000 is required to reap the benefits of all previous work and to complete the goals of this project.

This project is in its third of five years and is on schedule and within budget. Funds appropriated and expended to date have established necessary viable protocols and have been appropriately used to test, calibrate, and refine technologies and strategies to be tested in the field. Continued funding for Phase III of the project is necessary for extensive field testing (the major portion of Task B) to be completed. Field testing is crucial, so that the project will yield results that can be used to develop viable, cost-effective alternative passive technologies for use by homeowners for nitrogen issues associated with onsite systems.

Project Tasks (described previously) are broken down further into funding phases as follows:

Initial Funding in 2008-2010 (Phase I): \$900,000 (cash and budget authority) appropriated (in 2008 and 2009 state budgets) – Status: Complete. The initial funding was targeted to prioritize systems for testing, summarize existing knowledge, develop testing protocols, and establish a test facility for detailed soil and groundwater monitoring and for preliminary testing of pilot scale passive nitrogen reduction systems.

Funding in 2010-2011: \$2 million (cash and budget authority) appropriated (in 2010 state budget) – Status: Ongoing. This funding is for field monitoring over at least a one-year monitoring period of performance and cost of technologies at home sites, and of nitrogen fate

and transport. This funding will also continue the development and monitoring work at the test facility and continue the modeling work.

Funding in 2011-2012: Although \$2.75 million in budget authorization was appropriated in the 2011 state budget, no additional cash accompanied the budget authorization – Status: Ongoing. The remaining cash from the 2010-2011 appropriation is being used to continue the monitoring of systems and the soil modeling work. The preliminary results of the project are encouraging.

Funding in 2012-2013: \$1.5 million has been approved by the Florida Legislature – Status: Funding will not be released until it has been approved by the Governor and the 2012-2013 fiscal year has begun. These funds will be used to continue to install and monitor nitrogen reducing systems, draft a life cycle cost assessment template report for systems evaluated in this study, monitor nitrogen in the groundwater under existing OSTDS, and to develop, validate, and refine the soil modeling work.

Funding in 2013-2014: To adequately fund the final phase of the project, \$700,000 cash is required to fund the completion of scheduled tasks. Further testing and analysis is required to confirm the results to date with field data and to provide data for development of the engineering specifications for full system designs. The funds will be used to complete monitoring and other field activities, perform additional testing as deemed appropriate by the Legislature, and for final reporting with recommendations on onsite sewage nitrogen reduction strategies for Florida's future.

Further information on this project, including previous legislative reports and detailed project reports, can be found on the Department's website:

<http://www.doh.state.fl.us/environment/ostds/research/Nitrogen.html>

Table 2. Summary of Funding Phase Tasks and Progress

Task	Status	Phase I	Phase II	Phase IIIa	Phase IIIb
A Task A: Technology Selection & Prioritization		\$352,144	\$336,514	\$0	\$35,480
Literature review	Complete				
Ranking of nitrogen reduction technologies for field testing	Complete				
Design and construction of test facility	Complete				
Quality assurance project plan	Complete				
Monitoring and sample events (7 events)	Complete				
Final test facility report	Underway				
Final task report	Funding required				
B Task B: Field Testing of Technologies		\$50,202	\$599,610	\$265,408	\$263,834
Quality assurance project plan	Complete				
Installation of ranked nitrogen reduction technologies at 7 field sites	Underway				
System performance monitoring events at 7 sites	Underway				
Life cycle cost assessment template development	Not started				
Final life cycle cost assessment report (per system)	Funding required				
Final task report	Funding required				
C Task C: Evaluation of Nitrogen Reduction by Soils & Shallow Groundwater		\$216,164	\$1,095,977	\$436,220	\$162,640
Quality assurance project plan	Complete				
Design of test facility	Complete				
Construction of test facility	Complete				
Test facility monitoring and sample events (4 test areas sampled 6 times)	Not started, partially funded				
Instrumentation of existing OSTDS mound at GCREC facility	Complete				
GCREC mound sample events	Complete				
Field sites sample events (4 sites, 3 sites will be sampled 3 times, 1 site discontinued)	Underway, partially funded				
Final task report	Funding required				
D Task D: Nitrogen Fate and Transport Models		\$74,357	\$292,021	\$251,334	\$190,310
Quality assurance project plan	Complete				
Soil model development(simple and complex)	Underway				
Performance evaluation and refinement of soil models	Not started				
Shallow groundwater/soil model development	Funding required				
Performance evaluation and refinement of soil/groundwater model	Funding required				
Decision making framework	Funding required				
Final task report	Funding required				
Project Management (sum of contractor and DOH)		\$119,953	\$149,003	\$105,407	\$103,422
Contractor project management	Underway	\$90,695	\$109,003	\$90,407	\$87,679
DOH project management	Underway	\$29,258	\$40,000	\$15,000	\$15,743
Total Project Budget		\$812,820	\$2,473,125	\$1,058,369	\$755,686
Total Spent as of March 18, 2012		\$812,820	\$1,109,427	\$0	\$0
Balance		\$0	\$1,363,698	\$0	\$0

DOH – Department of Health
 GCREC – Gulf Coast Research & Education Center
 OSTDS – Onsite Sewage Treatment and Disposal Systems

5 RECOMMENDATIONS

The Research Review and Advisory Committee recommends that the 2013 Legislature:

1. Provide additional cash in the amount of \$700,000 for continuation and completion of the tasks associated with this legislatively mandated study.
2. Provide budget authority to DOH in the amount of \$700,000 for the fiscal year 2013-2014 for completion of the tasks associated with this legislatively mandated study.

This additional funding will be applied to the second part of the final phase of the project, primarily continuation and completion of field monitoring of performance and cost of technologies at home sites and of nitrogen fate and transport in the shallow groundwater, calibration and refinement of various nitrogen fate and transport models that will be calibrated with the field sampling results, and final reporting on all tasks with recommendations on onsite sewage nitrogen reduction strategies.

Continued support for this project will ultimately benefit Florida's approximately 2.7 million onsite system owners by finding cost-effective nitrogen reduction strategies that will improve environmental and public health protection. When fully funded, the results of this project will assist with producing nitrogen reducing systems that protect groundwater through reduced life-cycle costs and lower energy demands.

DRAFT

APPENDIX A. 2010 Legislative Language

DRAFT

SECTION 3 – HUMAN SERVICES

486 SPECIAL CATEGORIES

CONTRACTED SERVICES

FROM GENERAL REVENUE FUND	153,772
FROM ADMINISTRATIVE TRUST FUND	337,765
FROM FEDERAL GRANTS TRUST FUND	348,235
FROM GRANTS AND DONATIONS TRUST FUND	2,648,438
FROM RADIATION PROTECTION TRUST FUND	150,000

From the funds in Specific Appropriation 486, \$2,000,000 from the Grants and Donations Trust Fund is provided to the department to continue phase II and complete the study authorized in Specific Appropriation 1682 of chapter 2008-152, Laws of Florida. The report shall include recommendations on passive strategies for nitrogen reduction that complement use of conventional onsite wastewater treatment systems. The department shall submit an interim report of phase II on February 1, 2011, a subsequent status report on May 16, 2011, and a final report upon completion of phase II to the Governor, the President of the Senate, and the Speaker of the House of Representatives prior to proceeding with any nitrogen reduction activities.

Section 14. In order to implement Specific Appropriation 486 of the 2010-2011 General Appropriations Act, and for the 2010-2011 fiscal year only, the following requirements shall govern Phase 2 of the Department of Health's Florida Onsite Sewage Nitrogen Reduction Strategies Study:

(1) The underlying contract for which the study was let shall remain in full force and effect with the Department of Health and funding the contract for Phase 2 of the study shall be through the Department of Health.

(2) The Department of Health, the Department of Health's Research Review and Advisory Committee, and the Department of Environmental Protection shall work together to provide the necessary technical oversight of Phase 2 of the project, with the Department of Environmental Protection having maximum technical input.

(3) Management and oversight of Phase 2 shall be consistent with the terms of the existing contract; however, the main focus and priority for work to be completed for Phase 2 shall be in developing, testing, and recommending cost-effective passive technology design criteria for nitrogen reduction.

(4) The systems installed at actual home sites are experimental in nature and shall be installed with significant field testing and monitoring. The Department of Health is specifically authorized to allow installation of these experimental systems. In addition, before Phase 2 of the study is complete and notwithstanding any law to the contrary, a state agency may not adopt or implement a rule or policy that:

(a) Mandates, establishes, or implements any new nitrogen-reduction standards that apply to existing or new onsite sewage treatment systems or modification of such systems;

(b) Increases the cost of treatment for nitrogen reduction from onsite sewage treatment systems; or

(c) Directly requires or has the indirect effect of requiring, for nitrogen reduction, the use of performance-based treatment systems or any similar technology; provided the Department of Environmental Protection administrative orders recognizing onsite system modifications, developed

through a basin management action plan adopted pursuant to section 403.067, Florida Statutes, are not subject to the above restrictions where implementation of onsite system modifications are phased in after completion of Phase 2, except that no onsite system modification developed in a basin management action plan shall directly or indirectly require the installation of performance-based treatment systems.

DRAFT

APPENDIX B. 2011 Legislative Language

DRAFT

SECTION 3 – HUMAN SERVICES

465 SPECIAL CATEGORIES

CONTRACTED SERVICES

FROM GENERAL REVENUE FUND	97,489
FROM ADMINISTRATIVE TRUST FUND . . .	335,165
FROM FEDERAL GRANTS TRUST FUND . . .	643,776
FROM GRANTS AND DONATIONS TRUST FUND	3,401,038
FROM RADIATION PROTECTION TRUST FUND	150,000

From the funds in Specific Appropriation 465, \$2,725,000 in nonrecurring funds from the Grants and Donations Trust Fund is provided to the department to complete phase II and phase III and complete the study authorized in Specific Appropriation 1682 of chapter 2008-152, Laws of Florida. The report shall include recommendations on passive strategies for nitrogen reduction that complement use of conventional onsite wastewater treatment systems. The department shall submit an interim report of the completion of phase II and progress on phase III on February 1, 2012, a subsequent status report on May 16, 2012, and a final report upon completion of phase III to the Governor, the President of the Senate, and the Speaker of the House of Representatives prior to proceeding with any nitrogen reduction activities.

Section 7. In order to implement Specific Appropriation 465 of the 2011-2012 General Appropriations Act, and for the 2011-2012 fiscal year only, the following requirements govern the completion of Phase 2 and Phase 3 of the Department of Health's Florida Onsite Sewage Nitrogen Reduction Strategies Study:

(1) The Department of Health's underlying contract for the study remains in full force and effect and funding for completion of Phase 2 and Phase 3 is through the Department of Health.

(2) The Department of Health, the Department of Health's Research Review and Advisory Committee, and the Department of Environmental Protection shall work together to provide the necessary technical oversight of the completion of Phase 2 and Phase 3 of the project.

(3) Management and oversight of the completion of Phase 2 and Phase 3 must be consistent with the terms of the existing contract. However, the main focus and priority to be completed during Phase 3 shall be developing, testing, and recommending cost-effective passive technology design criteria for nitrogen reduction.

(4) The systems installed at homesites are experimental in nature and shall be installed with significant field testing and monitoring. The Department of Health is specifically authorized to allow installation of these experimental systems. Notwithstanding any other law, before Phase 3 of the study is completed, a state agency may not adopt or implement a rule or policy that:

(a) Mandates, establishes, or implements more restrictive nitrogen-reduction standards to existing or new onsite sewage treatment systems or modification of such systems; or

(b) Directly or indirectly requires the use of performance-based treatment systems or similar technology, such as through an administrative order developed by the Department of Environmental Protection as part of a basin management action plan adopted pursuant to s. 403.067, Florida Statutes. However, the implementation of more restrictive nitrogen-reduction standards for onsite systems may be required through a basin management action plan if such plan is phased in after completion of Phase 3.

**FLORIDA DEPARTMENT OF HEALTH
ONSITE NITROGEN REDUCTION STRATEGIES STUDY**

**PROGRESS REPORT NO. 13
(February, 2012)**

Task	Task Status	Activity this Period	Technical, Schedule, or Budget Problems Encountered	Recommended Methods to Resolve Problems
Task A – Technology Evaluation for Field Testing: Review, Prioritization, and Development				
Task A.1, Draft Literature Review Report	Task Complete	Draft literature review report completed on May 19, 2009.	None	N/A
Task A.2, Final Literature Review Report	Task Complete	Final literature review report completed on June 30, 2009. Revised Final report submitted on September 4, 2009.	None	N/A
Task A.3, Draft Classification of Technologies Report	Task Complete	Draft Classification, Ranking and Prioritization report completed on May 19, 2009.	None	N/A
Task A.4, Draft Technology Ranking Criteria Report	Task Complete	Draft Classification, Ranking and Prioritization report completed on May 19, 2009.	None	N/A
Task A.5, Draft Priority List for Testing Report	Task Complete	Draft Prioritization report completed on June 30, 2009.	None	N/A
Task A.6, Technology Classification, Ranking and Prioritization Workshop	Task Complete	Workshop presentation materials were developed. Workshop was conducted on May 28, 2009.	None	N/A
Task A.7, Final Classification of Technologies Report	Task Complete	Final Classification, Ranking and Prioritization report completed on September 24, 2009	None	N/A

Task	Task Status	Activity this Period	Technical, Schedule, or Budget Problems Encountered	Recommended Methods to Resolve Problems
Task A.8, Final Technology Ranking Criteria Report	Task Complete	Final Classification, Ranking and Prioritization report completed on September 24, 2009	None	N/A
Task A.9, Final Priority List for Testing Report	Task Complete	Final Classification, Ranking and Prioritization report completed on September 24, 2009	None	N/A
Task A.10, Draft Innovative Systems Applications Reports	Not started	No activity	N/A	N/A
Task A.11, Final Innovative Systems Applications Reports	Not started	No activity	N/A	N/A

Task	Task Status	Activity this Period	Technical, Schedule, or Budget Problems Encountered	Recommended Methods to Resolve Problems
Task A.12, Identification of Test Facility Sites	Task Complete	<p><i>USF Lysimeter Station</i> – A general assessment of lysimeter station rehabilitation needs has been determined and is summarized in a memorandum completed on June 18, 2009.</p> <p><i>UF Gulf Coast Research and Education Center</i> – Preliminary agreement from GCREC to participate on December 22, 2008. A summary of the site conditions and recommendations was sent to Elke and distributed May 19, 2009. On May 28, 2009 the RRAC voted to use the GCREC facility site as the only test facility site. Draft agreement submitted to GCREC on June 8, 2009, and returned to FDOH July 31, 2009 with revisions. Comments from review by FDOH received November 11, 2009. Draft letter of authorization for GCREC sent February 2, 2010 to FDOH. MOU signed June 1, 2010.</p>	Lysimeter station rehabilitation costs alone were likely to be in excess of \$60,000, which exceed the total construction budget for the Task A test facility.	We are recommending consolidating our activities to one test facility. We recommended to conduct all test facility activities at GCREC site.
Task A.13, Draft QAPP PNRS II	Task Complete	Draft QAPP for PNRS II report completed on June 18, 2009.	None	N/A
Task A.14, Recommendation for Process Forward Meeting	Task Complete	Recommendation for Process Forward meeting held on October 13, 2009. Task completed upon execution of contract amendment in February 2010.	None	N/A

Task	Task Status	Activity this Period	Technical, Schedule, or Budget Problems Encountered	Recommended Methods to Resolve Problems
Task A.15, Final QAPP PNRS II	Task Complete	Final QAPP for PNRS II report completed on November 24, 2009. Revised and amended for additives rule report completed on February 4, 2010. Amended report for sodium sesquicarbonate media completed on June 4, 2010.	None	N/A
Task A.16 Materials Testing for FDOH Additives Rule	Task Complete	<p>Florida additive rule for septic system products, evaluation of limestone and oyster shell, report completed on June 30, 2010.</p> <p>Florida additive rule for septic system products, evaluation of effluent of biofilters containing clinoptilolite, elemental sulfur, and lignocellulosic material report completed on April 15, 2011 and revised June 12, 2011.</p> <p>Additional WET testing on the effluent from bioreactor In-situ 1 (UNSAT-IS1) completed on July 29, 2011.</p> <p>Compliance approval received September 8, 2011 for all products submitted.</p>	None	N/A
Task A.17, PNRS Specification Reports	Task Complete	Specification report I completed on May 7, 2010. A revised final report was completed on May 24, 2010. Specification report II completed on November 22, 2011. A revised final report was completed on December 14, 2011.	None	N/A

Task	Task Status	Activity this Period	Technical, Schedule, or Budget Problems Encountered	Recommended Methods to Resolve Problems
Task A.18, Test Facility Design 50%	Task Complete	50% revised Design Drawings completed on September 4, 2009.	None	N/A
Task A.19, Test Facility Design 100%	Task Complete	100% Design Drawings completed on December 31, 2009.	None	N/A
Task A.20 PNRS II Test Facility Construction Support & Administration	Task Complete	Construction was started February 15, 2010. 50% construction completed April 2, 2010. 100% construction completed April 30, 2010.	None	N/A
Task A.21 PNRS II Test Facility Construction 50%	Task Complete	Construction was started February 15, 2010, 50% construction progress report completed on April 2, 2010.	None	N/A
Task A.22 PNRS II Test Facility Construction 100%	Task Complete	100% construction progress report completed on April 30, 2010.	None	N/A
Task A.23 PNRS II Test Facility Construction Substantial Completion	Task Complete	Construction punch list completed on April 27, 2010.	None	N/A
Task A.24 PNRS II Test Facility Accept Construction	Task Complete	As-built documents completed on May 28, 2010.	None	N/A
Task A.25 Monitoring & Sample Event Reports	Task Complete	Sample Event Report (SER) No. 1 completed on July 16, 2010. SER No. 2 completed on September 28, 2010. SER No. 3 completed on December 16, 2010. SER No. 4 completed on February 2, 2011. SER No. 5 completed on May 12, 2011. SER No. 6 completed on June 9, 2011. SER No. 7 completed on October 20, 2011.	None	N/A

Task	Task Status	Activity this Period	Technical, Schedule, or Budget Problems Encountered	Recommended Methods to Resolve Problems
Task A.26 Data Summary Reports	Task Complete	Data Summary Report (DSR) No. 1 completed on September 2, 2010. DSR No. 2 completed on October 5, 2010. DSR No. 3 completed on January 20, 2011. DSR No. 4 completed on March 4, 2011. DSR No. 5 completed on May 12, 2011. DSR No. 6 completed on July 5, 2011. DSR No. 7 completed on November 22, 2011.	None	N/A
Task A.27 Draft PNRS II Report	Underway	Started work on draft PNRS II report.	N/A	N/A
Task A.28 Final PNRS II Report	Not started	No activity	N/A	N/A
Task A.31 Change-order Allowance	Underway	FDOH authorized \$20,000 for the PNRS II modifications completed December 16, 2010. FDOH authorized \$19,000 to perform a simulation of bioreactor filtration treatment of onsite wastewater April 4, 2011. The Biotool Task 1a and 1b reports completed on December 8, 2011. Remaining change-order budget = \$ 1000.	None	N/A

Task	Task Status	Activity this Period	Technical, Schedule, or Budget Problems Encountered	Recommended Methods to Resolve Problems
Task B – Field Testing of Technologies and Cost Documentation				
Task B.1, Identification of Home Sites	Task Complete	Several home sites in Manasota Key, Wakulla County, Seminole County, Lee County, Hillsborough County and Marion County have been visited to perform preliminary evaluation of sites with homeowners interested in the project. Two Wakulla County homeowner agreements completed on October 5, 2010. One Hillsborough County homeowner agreement completed on March 4, 2011. One Seminole County homeowner agreement completed on April 25, 2011. Two Seminole County, one Marion County, one Wakulla County and one Lee County homeowner agreement completed on July 6, 2011. One Marion County homeowner agreement completed on October 20, 2011.	None	N/A
Task B.2, Vendor Agreement Reports	Underway	Started work on vendor agreements. One vendor agreement completed on April 13, 2011.	None	N/A
Task B.3, Draft QAPP for Field Testing	Task Complete	Draft QAPP for field testing report completed on July 16, 2010.	None	N/A
Task B.4, Recommendation for Process Forward Meeting	Task Complete	Conference call meeting was held on October 11, 2010. Meeting minutes were submitted on November 1, 2010.	None	N/A
Task B.5, Final QAPP Field Testing	Task Complete	Final QAPP for field testing report completed on November 1, 2010.	None	N/A

Task	Task Status	Activity this Period	Technical, Schedule, or Budget Problems Encountered	Recommended Methods to Resolve Problems
Task B.6 Field Systems Installation Report (per system)	Underway	B-HS1, located in Wakulla County, Nitrex™ system installation completed on June 10, 2011. Installation report completed on July 6, 2011. Started design of B-HS2, located in Hillsborough County.	None	N/A
Task B.7 Field Systems Monitoring Report (per event)	Underway	B-HS1 first sample event conducted on October 26, 2011. B-HS1 second sample event conducted on January 25, 2012. Monitoring Report (MR) No. 1 completed on February 24, 2012 . MR No. 2 completed on March 28, 2012.	N/A	N/A
Task B.11, LCCA Template Report (draft)	Not started	No activity	N/A	N/A
Task B.12 LCCA Template Report (final)	Not started	No activity	N/A	N/A
Task B.16 Change-order Allowance	Underway	FDOH authorized \$3,718.05 for RRAC meeting attendance on March 24, 2011. FDOH authorized \$4,702 for the third sample for Task A.16 additives testing completed on April 15, 2011. FDOH authorized \$2,131 for an additional WET test on UNSAT-IS1 effluent for Task A.16 additives testing completed on July 29, 2011. Remaining change-order budget = \$39,448.95.	N/A	N/A

Task	Task Status	Activity this Period	Technical, Schedule, or Budget Problems Encountered	Recommended Methods to Resolve Problems
Task C – Evaluation of Nitrogen Reduction Provided by Soils and Shallow Groundwater				
Task C.1, Draft Literature Review on Nitrogen Reduction in Soils & Shallow GW Report	Task Complete	Draft Literature Review on nitrogen reduction in soils and shallow groundwater report completed on June 30, 2009.	None	N/A
Task C.2, Final Literature Review on Nitrogen Reduction in Soils & Shallow GW Report	Task Complete	Final Literature Review on nitrogen reduction in soils and shallow groundwater report completed on November 24, 2009.	None	N/A
Task C.3, Draft QAPP Evaluation of Nitrogen Reduction Provided by Soils & Shallow GW	Task Complete	Draft QAPP on nitrogen reduction in soils and shallow groundwater report completed on October 30, 2009.	None	N/A
Task C.4, Recommendation for Process Forward Meeting	Task Complete	Conference call meeting was held on November 23, 2009. Meeting minutes submitted on November 25, 2009 served as half of the deliverable. Task complete upon completion of contract amendment executed February 2010.	None	N/A
Task C.5, Final QAPP Evaluation of Nitrogen Reduction Provided by Soils & Shallow GW	Task Complete	Final QAPP on nitrogen reduction in soils and shallow groundwater report was submitted on December 4, 2009. Determined to be 80% complete on December 23, 2009. Revisions completed February 5, 2010.	None	N/A
Task C.6, S&GW Test Facility Design 50%	Task Complete	Test Facility Design 50% drawings completed on June 30, 2009.	None	N/A

Task	Task Status	Activity this Period	Technical, Schedule, or Budget Problems Encountered	Recommended Methods to Resolve Problems
Task C.7, S&GW Test Facility Design 100%	Task Complete	100% Design Drawings completed on December 31, 2009	None	N/A
Task C.8, S&GW Test Facility Design Final	Task Complete	Final S&GW Test Facility Design completed on March 4, 2010.	None	N/A
Task C.9, S&GW Test Facility Construction Support & Administration	Task Complete	Construction was started November 8, 2011. 50% construction completed November 16, 2011. 100% construction completed November 21, 2011.	N/A	N/A
Task C.10, S&GW Test Facility Construction 50%	Task Complete	Construction was started November 8, 2011, 50% construction progress report completed on December 20, 2011.	N/A	N/A
Task C.11, S&GW Test Facility Construction 100%	Task Complete	100% construction progress report completed on December 20, 2011.	N/A	N/A
Task C.12, S&GW Test Facility Construction Substantial Completion	Task Complete	Construction punch list completed on December 20, 2011.	N/A	N/A
Task C.13, S&GW Test Facility Accept Construction	Task Complete	S&GW test facility record drawings submitted on February 24, 2012.	N/A	N/A
Task C.14, Soils & Hydrogeologic & Monitoring Plan for S&GW Test Facility	Underway	Started work on soils, hydrogeologic and monitoring plan for S&GW test facility.	N/A	N/A

Task	Task Status	Activity this Period	Technical, Schedule, or Budget Problems Encountered	Recommended Methods to Resolve Problems
Task C.15, Tracer Testing at GCREC	Underway	A tracer test at the GCREC mound site was started April 6, 2011. Tracer Test Memo No. 1 completed on July 6, 2011. A second tracer test for the S&GW test facility was started November 9, 2011.	N/A	N/A
Task C.16 S&GW Sample Event Report	Not started	No activity	N/A	N/A
Task C.17 S&GW Data Summary Report	Not started	No activity	N/A	N/A
Task C.19 Field Site Selection	Underway	Several home sites in Wakulla County, Lee County, Seminole County and Marion County have been visited to perform preliminary evaluation of sites with homeowners interested in the project. One Wakulla County homeowner agreement completed on October 5, 2010. One Seminole County homeowner agreement completed on April 25, 2011. Two Seminole County, one Marion County, and one Hillsborough County homeowner agreement completed on July 6, 2011. One Polk County homeowner agreement completed on February 27, 2012.	None	N/A
Task C.20 Instrumentation of GCREC Mound System	Task Complete	Instrumentation of GCREC Mound system 100% progress report completed on December 16, 2010.	None	N/A

Task	Task Status	Activity this Period	Technical, Schedule, or Budget Problems Encountered	Recommended Methods to Resolve Problems
Task C.21 GCREC Mound Sample Event Report	Task Complete	GCREC Mound Sample Event Report (SER) No. 1 completed on March 7, 2011. SER No. 2 completed on May 12, 2011. SER No. 3 completed on July 6, 2011. SER No. 4 completed on November 22, 2011	N/A	N/A
Task C.22 GCREC Mound Data Summary Report	Underway	GCREC Mound data summary report (DSR) No. 1 completed on May 12, 2011. DSR No. 2 completed on July 6, 2011. DSR No. 3 completed on October 20, 2011. DSR No. 4 completed on January 19, 2012.	N/A	N/A
Task C.23 Instrumentation of Remaining Field Sites	Underway	Instrumentation at C-HS1 located in Wakulla County completed in May 2011. Instrumentation report completed on July 6, 2011. Instrumentation at C-HS2 located in Seminole County completed in July 2011. Instrumentation report completed August 17, 2011. Started instrumentation at C-HS3 located in Polk County.	Karst geology encountered at C-HS1 site has caused difficulty in installing monitoring points and determining groundwater flow direction.	N/A
Task C.24 Field Sites Sample Event Reports (SER)	Underway	<u>C-HS1</u> : SER No. 1 completed on July 6, 2011. <u>C-HS2</u> : SER No. 1 completed on August 17, 2011. SER No. 2 completed on January 19, 2012.	C-HS1 site proved extremely difficult to monitor and interpret.	Evaluate actions after monitoring data analysis

Task	Task Status	Activity this Period	Technical, Schedule, or Budget Problems Encountered	Recommended Methods to Resolve Problems
Task C.25 Field Sites Data Summary Report (DSR)	Underway	<u>C-HS1</u> : DSR No. 1 completed on July 6, 2011. <u>C-HS2</u> : DSR No. 1 completed on October 20, 2011. DSR No. 2 completed on January 19, 2012.	C-HS1 site proved extremely difficult to monitor and interpret. Recommended abandoning GW monitoring effort at site.	Abandoned C-HS1 site for soil and groundwater monitoring.
Task C.30 Change-order Allowance	Not started	No activity	N/A	N/A
Task D – Nitrogen Fate and Transport Modeling				
Task D.1, Draft Literature Review on Nitrogen Fate & Transport Model Report	Task Complete	Draft Literature Review on nitrogen fate and transport model report completed on June 30, 2009.	None	N/A
Task D.2, Final Literature Review on Nitrogen Fate & Transport Model Report	Task Complete	Final Literature Review on nitrogen fate and transport model report completed on December 4, 2009. Determined to be 80% complete on December 23, 2009. Revised report complete on February 5, 2010.	None	N/A
Task D.3, Selection of Existing Data Set for Calibration Report	Task Complete	Selection of Existing Data Set for Calibration report completed on June 30, 2009.	None	N/A
Task D.4, Draft QAPP N Fate and Transport Modeling	Task Complete	Draft QAPP report completed on April 2, 2010.	None	N/A
Task D.5, Recommendation for Process Forward	Task Complete	Conference call meeting was held on July 13, 2010. Meeting minutes submitted on August 14, 2010.	None	N/A

Task	Task Status	Activity this Period	Technical, Schedule, or Budget Problems Encountered	Recommended Methods to Resolve Problems
Task D.6, Final QAPP N Fate and Transport Modeling	Task Complete	Final QAPP report completed on September 22, 2009.	None	N/A
Task D.7 Simple Soil Tools	Underway	25% Progress report completed on March 9, 2012.	None	N/A
Task D.8 Complex Soil Model	Underway	40% Progress report completed on March 9, 2012.	None	N/A
Task E – Project Management, Coordination and Meetings				
Task E.1, Project Kick-off Meeting	Task Complete	The project kick-off meeting was held February 27, 2009. Meeting minutes were completed on March 19, 2009.	None	N/A
Task E.2, PM-Project Progress Report	Progress Report 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12 - Complete	The February 2012 bimonthly progress report (this report) was completed March 28, 2012.	None	N/A
Task E.3, RRAC or TRAP Presentation	Underway	RRAC meeting was attended and a presentation given on July 1, 2009; March 23, 2010; June 10, 2010; March 24, 2011; September 8, 2011; and January 4, 2012. TRAP meeting was attended and a presentation given August 27, 2009. RRAC meeting presentation and tour of GCREC PNRS II facility was given December 10, 2010.	None	N/A

Task	Task Status	Activity this Period	Technical, Schedule, or Budget Problems Encountered	Recommended Methods to Resolve Problems
Task E.4 RRAC or TRAP Meeting Attendance	Underway	RRAC meeting was attended: <ul style="list-style-type: none"> • December 16, 2009 • November 5, 2010 • April 20, 2011 • November 15, 2011 	None	N/A
Task E.4, PAC Meeting	Not started	No activity	N/A	N/A

STATE OF FLORIDA

DEPARTMENT OF HEALTH

CONTRACT RENEWAL # R100

ORIGINAL CONTRACT # CORCL

THIS RENEWAL is entered into between the State of Florida, Department of Health, hereinafter referred to as the "department" and Hazen and Sawyer, P.C., hereinafter referred to as the "provider".

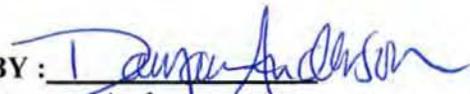
As stated on page 42 of Attachment I, paragraph D, of Contract # CORCL, the department is exercising its option to renew this contract if mutually agreed to by both parties beginning on January 16, 2012 and ending on January 16, 2015 in an amount not to exceed \$4,999,999.00 as stated in the original contract.

All terms and conditions of said original Contract and any supplements and amendments thereto shall remain in force and effect for this renewal.

IN WITNESS WHEREOF, the parties have executed this Renewal by their undersigned officials as duly authorized.

PROVIDER: HAZEN AND SAWYER, P.C.

**STATE OF FLORIDA
DEPARTMENT OF HEALTH**

SIGNED BY: 
NAME: Damann Anderson

SIGNED BY: 
NAME: Steven Harris, M.D., M.Sc.

TITLE: Vice President

TITLE: Deputy Secretary of Health

DATE: 1/3/2012

DATE: 5 January 2012

FEDERAL ID NUMBER: 13-2904652

AMENDMENT # R1-A1

THIS AMENDMENT, entered into between the State of Florida, Department of Health, hereinafter referred to as the "department" and Hazen and Sawyer, P.C., hereinafter referred to as the "provider", amends contract # CORCL as follows:

1. Attachment I pages 39-41 of the original contract are replaced by the attached Exhibit 1.

This amendment shall begin on January 16, 2012, or the date on which the amendment has been signed by both parties, whichever is later.

All provisions in the contract and any attachments thereto in conflict with this amendment shall be and are hereby changed to conform with this amendment.

All provisions not in conflict with this amendment are still in effect and are to be performed at the level specified in the contract.

This amendment and all its attachments are hereby made a part of the contract.

IN WITNESS THEREOF, the parties hereto have caused this 1 page amendment with 5 page exhibit to be executed by their officials thereunto duly authorized.

STATE OF FLORIDA
DEPARTMENT OF
HEALTH

PROVIDER: Hazen and Sawyer, P.C.

SIGNED
BY: 

NAME: Damann L. Anderson
TITLE: Vice President

DATE: 1/3/2012

FEDERAL ID NUMBER:

13-2904652

SIGNED
BY: 

NAME: Steven Harris, M.D., M.Sc.
TITLE: Deputy Secretary of Health

DATE: 5 January 2012

TASK NO.	Task	Per Deliverable Subtotal	No. of Deliverables		Total Cost		Total
			Prior to Amendment 4 (Phase 1 (All) & Phase 2 (Part))	Remaining Deliverables (Phase 2 (Part) & Phase 3 (All))	Prior to Amendment 4 (Phase 1 (All) & Phase 2 (Part))	Remaining Cost (Phase 2 (Part) & Phase 3 (All))	
A	Task A: Technology Selection & Prioritization				\$574,244	\$149,894	\$724,138
A.1	Draft Literature Review Report	\$ 13,796.00	1	0	\$13,796	\$0	\$13,796
A.2	Final Literature Review Report	\$ 6,092.00	1	0	\$6,092	\$0	\$6,092
A.3	Draft Classification of Technologies Report	\$ 12,830.60	1	0	\$12,831	\$0	\$12,831
A.4	Draft Technology Ranking Criteria Report	\$ 10,096.00	1	0	\$10,096	\$0	\$10,096
A.5	Draft Priority List for Testing Report	\$ 14,858.60	1	0	\$14,859	\$0	\$14,859
A.6	Technology Classification, Ranking and Prioritization Workshop	\$ 18,242.60	1	0	\$18,243	\$0	\$18,243
A.7	Final Classification of Technologies Report	\$ 5,044.00	1	0	\$5,044	\$0	\$5,044
A.8	Final Technology Ranking Criteria Report	\$ 7,944.00	1	0	\$7,944	\$0	\$7,944
A.9	Final Priority List for Testing Report	\$ 7,786.60	1	0	\$7,787	\$0	\$7,787
A.10	Draft Innovative Systems Applications Report (per technology)	\$ 11,655.00	0	1	\$0	\$11,655	\$11,655
A.11	Final Innovative Systems Applications Report (per technology)	\$ 9,219.00	0	1	\$0	\$9,219	\$9,219
A.12	Identification of Test Facility Sites (per site agreement)	\$ 2,538.25	2	0	\$5,077	\$0	\$5,077
A.13	Draft PNRS II QAPP	\$ 13,170.50	1	0	\$13,171	\$0	\$13,171
A.14	Recommendation for Process Forward (per meeting)	\$ 6,236.50	1	0	\$6,237	\$0	\$6,237
A.15	Final PNRS II QAPP	\$ 4,496.00	1	0	\$4,496	\$0	\$4,496
A.16	Materials Testing for FDOH Additives Rule	\$ 4,000.00	4	0	\$16,000	\$0	\$16,000
A.17	PNRS Specification Reports	\$ 18,715.00	1	1	\$18,715	\$18,715	\$37,430
A.18	PNRS II Test Facility Design 50%	\$ 11,721.48	1	0	\$11,721	\$0	\$11,721
A.19	PNRS II Test Facility Design 100%	\$ 16,200.50	1	0	\$16,201	\$0	\$16,201
A.20	PNRS II Test Facility Construction Support and Administration (2 deliverables, 50% at start, 50% at completion)	\$ 16,601.00	2	0	\$33,202	\$0	\$33,202
A.21	PNRS II Test Facility Construction 50% (2 deliverables, start and 50% complete)	\$ 25,000.00	2	0	\$50,000	\$0	\$50,000

A.22	PNRS II Test Facility Construction 100% (cost reimbursable)	\$ 40,000.00	1	0	\$40,000	\$0	\$40,000
A.23	PNRS II Test Facility Construction Substantial Completion	\$ 10,000.00	1	0	\$10,000	\$0	\$10,000
A.24	PNRS II Test Facility Accept Construction	\$ 9,650.00	1	0	\$9,650	\$0	\$9,650
A.25	Monitoring and Sample Event Reports (per sample event)	\$ 28,985.00	7	0	\$202,895	\$0	\$202,895
A.26	Data Summary Report (per sample event)	\$ 3,365.00	6	1	\$20,190	\$3,365	\$23,555
A.27	Draft PNRS II Report	\$ 34,220.00	0	1	\$0	\$34,220	\$34,220
A.28	Final PNRS II Report	\$ 17,240.00	0	1	\$0	\$17,240	\$17,240
A.29	Draft Task A Final Report	\$ 26,000.00	0	1	\$0	\$26,000	\$26,000
A.30	Task A Final Report	\$ 9,480.00	0	1	\$0	\$9,480	\$9,480
A.31	Change-order Allowance	\$ 40,000.00	0.5	0.5	\$20,000	\$20,000	\$40,000
B	Task B: Field Testing of Technologies				\$192,987	\$986,067	\$1,179,054
B.1	Identification of Home Sites (per homeowner agreement)	\$ 9,341.67	10	0	\$93,416	\$0	\$93,416
B.2	Vendor Agreement Report (per vendor agreement)	\$ 7,580.00	1	1	\$7,580	\$7,580	\$15,160
B.3	Draft QAPP for Field Testing	\$ 25,700.00	1	0	\$25,700	\$0	\$25,700
B.4	Recommendation for Process Forward (per meeting)	\$ 6,780.00	1	0	\$6,780	\$0	\$6,780
B.5	Final QAPP Field Testing	\$ 11,060.00	1	0	\$11,060	\$0	\$11,060
B.6	Field Systems Installation Report (per system)	\$ 37,900.00	1	6	\$37,900	\$227,400	\$265,300
B.7	Field Systems Monitoring Report (per system, per event)	\$ 8,402.33	0	56	\$0	\$470,531	\$470,531
B.8	Field Systems Operation, Maintenance and Repairs Report (per system)	\$ 8,630.00	0	7	\$0	\$60,410	\$60,410
B.9	Technical Description of Nitrogen Reduction Technology Report	\$ 17,271.00	0	1	\$0	\$17,271	\$17,271
B.10	Acceptance of System by Owner Report (per system)	\$ 4,758.00	0	7	\$0	\$33,306	\$33,306
B.11	LCCA Template Report (draft template and user guidelines)	\$ 18,140.00	0	1	\$0	\$18,140	\$18,140
B.12	LCCA Template Report (final template and user guidelines)	\$ 9,080.00	0	1	\$0	\$9,080	\$9,080
B.13	LCCA Report (per system)	\$ 5,040.00	0	7	\$0	\$35,280	\$35,280

B.14	Draft Task B Final Report	\$ 45,120.00	0	1	\$0	\$45,120	\$45,120
B.15	Task B Final Report	\$ 22,500.00	0	1	\$0	\$22,500	\$22,500
B.16	Change-order Allowance	\$ 50,000.00	0.2	0.8	\$10,551	\$39,449	\$50,000
C	Task C: Evaluation of Nitrogen Reduction by Soils & Shallow GW				\$592,704	\$1,318,297	\$1,911,001
C.1	Draft Literature Review on Nitrogen Reduction in Soil Report	\$ 11,300.00	1	0	\$11,300	\$0	\$11,300
C.2	Final Literature Review on Nitrogen Reduction in Soil Report	\$ 6,900.00	1	0	\$6,900	\$0	\$6,900
C.3	Draft QAPP Evaluation of N Reduction by Soils & Shallow GW	\$ 38,939.50	1	0	\$38,940	\$0	\$38,940
C.4	Recommendation for Process Forward (per meeting)	\$ 5,906.50	1	0	\$5,906	\$0	\$5,906
C.5	Final QAPP Evaluation of N Reduction by Soils & Shallow GW	\$ 9,189.73	1	0	\$9,190	\$0	\$9,190
C.6	S&GW Test Facility Design 50%	\$ 26,470.50	1	0	\$26,471	\$0	\$26,471
C.7	S&GW Test Facility Design 100%	\$ 26,570.50	1	0	\$26,571	\$0	\$26,571
C.8	S&GW Test Facility Design Final	\$ 21,207.00	1	0	\$21,207	\$0	\$21,207
C.9	S&GW Construction Support & Administration (2 deliverables, 50% at start, 50% at completion)	\$ 13,560.00	0	2	\$0	\$27,120	\$27,120
C.10	S&GW Test Facility Construction 50% (2 deliverables, start and 50% complete)	\$ 15,000.00	0	2	\$0	\$30,000	\$30,000
C.11	S&GW Test Facility Construction 100% (cost reimbursable)	\$ 40,000.00	0	1	\$0	\$40,000	\$40,000
C.12	S&GW Test Facility Construction Substantial Completion	\$ 3,680.00	0	1	\$0	\$3,680	\$3,680
C.13	S&GW Test Facility Accept Construction	\$ 7,480.00	0	1	\$0	\$7,480	\$7,480
C.14	Soils & Hydrogeologic and Monitoring Plan for S&GW Test Facility	\$ 43,074.00	0	1	\$0	\$43,074	\$43,074
C.15	Tracer Testing at GCREC (per tracer test)	\$ 18,910.00	1	2	\$18,910	\$37,820	\$56,730
C.16	S&GW Sample Event Reports (per sample event)	\$ 47,523.28	0	6	\$0	\$285,140	\$285,140
C.17	S&GW Data Summary Report (per sample event)	\$ 13,240.00	0	6	\$0	\$79,440	\$79,440
C.18	Test Facility Closeout Report	\$ 13,080.00	0	1	\$0	\$13,080	\$13,080
C.19	Field Site Selection (per property owner agreement)	\$ 9,932.67	6	1	\$59,596	\$9,933	\$69,529
C.20	Instrumentation of GCREC Mound System	\$ 59,495.00	1	0	\$59,495	\$0	\$59,495

C.21	GCREC Mound Sample Event Report (per sampling event)	\$ 38,290.00	3	1	\$114,870	\$38,290	\$153,160
C.22	GCREC Mound Data Summary Report (per sampling event)	\$ 8,160.00	3	1	\$24,480	\$8,160	\$32,640
C.23	Instrumentation of Remaining Field Sites Report (per site)	\$ 43,075.00	2	2	\$86,150	\$86,150	\$172,300
C.24	Field Sites Sample Event Reports (per sample event, per site)	\$ 36,520.00	2	11	\$73,040	\$401,720	\$474,760
C.25	Field Sites Data Summary Report (per sample event, per site)	\$ 4,840.00	2	11	\$9,680	\$53,240	\$62,920
C.26	Draft Site Summary and Close-out Memo (per site)	\$ 8,680.00	0	5	\$0	\$43,400	\$43,400
C.27	Final Site Close-Out Memo (per site)	\$ 2,670.00	0	5	\$0	\$13,350	\$13,350
C.28	Draft Task C Final Report	\$ 40,040.00	0	1	\$0	\$40,040	\$40,040
C.29	Task C Final Report	\$ 17,180.00	0	1	\$0	\$17,180	\$17,180
C.30	Change-order Allowance	\$ 40,000.00	0	1	\$0	\$40,000	\$40,000
D	Task D: Nitrogen Fate and Transport Models				\$90,014	\$718,009	\$808,023
D.1	Draft Literature Review on Nitrogen Fate & Transport Model Report	\$ 15,533.23	1	0	\$15,533	\$0	\$15,533
D.2	Final Literature Review on Nitrogen Fate & Transport Model Report	\$ 5,211.08	1	0	\$5,211	\$0	\$5,211
D.3	Selection of Existing Data Set for Calibration Report	\$ 15,092.20	1	0	\$15,092	\$0	\$15,092
D.4	Draft QAPP N Fate and Transport Models	\$ 32,186.76	1	0	\$32,187	\$0	\$32,187
D.5	Recommendation for Process Forward (per meeting)	\$ 6,334.00	1	0	\$6,334	\$0	\$6,334
D.6	Final QAPP N Fate and Transport Models	\$ 15,657.38	1	0	\$15,657	\$0	\$15,657
D.7	Simple Soil Tools	\$ 52,448.00	0	1	\$0	\$52,448	\$52,448
D.8	Complex Soil Model	\$ 86,641.00	0	1	\$0	\$86,641	\$86,641
D.9	Complex Soil Model Performance Evaluation	\$ 48,577.00	0	1	\$0	\$48,577	\$48,577
D.10	Validate/Refine Complex Soil Model	\$ 72,132.04	0	1	\$0	\$72,132	\$72,132
D.11	Aquifer Model Combined with Complex Soil Model Development	\$ 113,411.22	0	1	\$0	\$113,411	\$113,411
D.12	Aquifer-Complex Soil Model Performance Evaluation	\$ 127,922.99	0	1	\$0	\$127,923	\$127,923
D.13	Validate/Refine Aquifer-Complex Soil Model with Data Collection from Task C	\$ 95,733.70	0	1	\$0	\$95,734	\$95,734

D.14	Development of Aquifer-Complex Soil Model for Multiple Spatial Inputs	\$ 25,371.84	0	1	\$0	\$25,372	\$25,372
D.15	Decision-Making Framework Considering Uncertainty	\$ 52,638.54	0	1	\$0	\$52,639	\$52,639
D.16	Task D Guidance Manual (Draft)	\$ 20,590.63	0	1	\$0	\$20,591	\$20,591
D.17	Task D Guidance Manual (Final)	\$ 12,541.41	0	1	\$0	\$12,541	\$12,541
D.18	Change-order Allowance	\$ 10,000.00	0	1	\$0	\$10,000	\$10,000
E	Task E: Project Management, Coordination, and Meetings				\$143,337	\$234,445	\$377,782
E.1	Project Kick-Off Meeting (conference call)	\$ 7,724.00	1	0	\$7,724	\$0	\$7,724
E.2	PM-Project Progress Reports (per bimonthly report)	\$ 9,298.00	10	12	\$92,980	\$111,576	\$204,556
E.3	RRAC or TRAP Presentation (per meeting)	\$ 11,732.25	3	5	\$35,197	\$58,661	\$93,858
E.4	RRAC or TRAP Meeting Attendance (per meeting)	\$ 3,718.05	2	6	\$7,436	\$22,308	\$29,744
E.5	PAC Meetings (per meeting)	\$ 41,900.00	0	1	\$0	\$41,900	\$41,900
F	Task F: Other						
PROJECT TOTALS					\$1,593,286	\$3,406,712	\$4,999,998

Research Review and Advisory Committee 2011 Research Priorities

Ranking	Project
1	Continuation of Inventory of OSTDS in Florida
2	Effectiveness of Outlet Filters
3	Life Expectancy of Onsite Systems
4	Drip Disposal With Septic Tank Quality Effluent
5	Correlations Between Water Quality, OSTDS, and Health Effects

Discussion of these priorities during the April 10, 2012 meeting is to focus on what projects, or portions of projects, could be conducted at little to no cost.

There is still a carryover project from the 2008 Research Priorities that is currently tasked to be handled by research program staff: Alternative Drainfield Product Assessment (to compare the functioning of alternative drainfield materials to standard aggregate).

PROJECT DESCRIPTION RANKED PROJECT #1

Project Title	Continuation of Inventory of OSTDS in Florida
Proposed By	Elke Ursin
Background	Having an inventory of OSTDS is the first step to any management program. A snapshot inventory was completed in 2009 per the request of the State Legislature. There has been much interest in these data by DEP, consultants, county health departments (CHD's), etc. This information is quickly outdated if not updated. The original data had many unknown/estimated parcels due to a lack of response for data from many DEP regulated Wastewater Treatment Plants (WWTP's). Part of this project would be to make another attempt at gathering that data.
Objectives and Outcomes	Update the current inventory from 2009 and develop a method to make this process easier for future efforts.
Research Approach	<ul style="list-style-type: none"> • Merge the existing inventory data into the Environmental Health Database (EHD) which will allow for real-time data updates as permits are entered into the system by the CHD's • Update EHD with Department of Revenue data annually for updated parcel information • Update with DEP data on WWTP's • Send letters to WWTP's to gather their sewer data and update the inventory • Develop and implement a grant program so CHD's can verify and update unknown parcels
Potential Collaboration	Collaborate with DEP on the information gathering for the WWTP's. DEP has indicated they are interested in collaborating. This was not done with the first round of data collection and will likely yield a higher response rate.
Duration	1-2 years
Estimated Budget (\$)	\$150,000
Ease of Implementation	Medium effort, some work can be contracted out but several components are best handled by staff. Updating EHD can be done through modifying an existing DOH contract, updating DOR and WWTP information could possibly be done through a purchase order (if under \$35,000), and the grant program with CHD's to be implemented by staff.
Comments	This project ranks highly with Gerald Briggs, Bureau Chief for the Onsite Sewage Program, as this inventory is the starting point for any onsite sewage management program.

PROJECT DESCRIPTION RANKED PROJECT #2	
Project Title	Effectiveness of Outlet Filters
Proposed By	Eanix Poole
Background	The objective/purpose of outlet filters is to retain solids in the tank where further digestion can take place thus "in theory" extending the life of the drainfield because of a cleaner higher quality effluent. Outlet filters first appeared in the rule in 1995 as an alternative to multi-chambered tanks. In 1997, Florida became the first state to require outlet filters in new installations. For several years prior to 1997, outlet tees were required to have a gas baffle to prevent solids being directly discharged to the drainfield (same theory). Economics played a role in this as there was only one manufacturer who made outlet filters and the product was quite expensive. This manufacturer developed a simple, inexpensive, filter targeting the Florida market. Other companies soon developed similar products. The Department developed Approval Standards for Outlet Devices that were incorporated by reference into the rule to ensure minimum design and performance criteria. Other states are now requiring outlet filters and industry has responded with a multitude of products at various price ranges.
Objectives and Outcomes	<ol style="list-style-type: none"> 1. Determine whether outlet filters are performing as expected/described and not causing unnecessary expense to the homeowner as in unnecessary cleanings and or pump outs. 2. Determine average maintenance frequency such as filter cleaning or pump outs. 3. Determine whether Department's Approval Standards for Outlet Filters are adequate.
Research Approach	<p>Phase I. Perform survey in a minimum of 3 counties: one small, one medium, and one large. Take a small sample of installations since 1997 and determine history of maintenance and pump outs.</p> <p>Survey Environmental Health offices and get their input on filter performance.</p> <p>Survey Installer/Pumper Companies to determine their experience with filters.</p> <p>Survey Pumper Companies to determine their perspective.</p> <p>Phase II. Depending on findings of Phase I, may need to field test filters for performance.</p>
Potential Collaboration	Health Departments, Florida Onsite Wastewater Association, Universities, Private Research Contractor
Duration	Survey should be finished within 6 months of work start approval.
Estimated Budget (\$)	Phase I: \$35,000; Phase II: dependant on results of Phase I
Ease of Implementation	Should be a simple project. Depends on whether the Department chooses to perform or contracts to other entity.
Comments	Filters on the market today are capable of performing for at least five years in a normal usage household without maintenance. It needs to be determined if Florida homeowners are facing unnecessary expenses for more frequent maintenance and or pump outs.

PROJECT DESCRIPTION RANKED PROJECT #3

Project Title	Life Expectancy of Onsite Systems
Proposed By	Eberhard Roeder
Background	<p>A summary of three Florida studies (statewide, Marion, Sarasota) in late 1998 found an average age at failure (defined as getting a repair permit) of OSTDS of about 18 years, and described a bimodal failure distribution, with early failures attributed to hydraulic overloading, and older failures attributed to roots. One of the studies saw an increase to about 28 years that was attributed to a change in county ordinances. On the other hand, repair rates of one to two percent would lead to an estimate of 50-100 years as life expectancy. Possibly explaining part of the difference is an observation that average age at failure appears to be higher in areas with older housing stock. Still other observations suggest that tank corrosion varies regionally.</p> <p>So, what is the expected life of an OSTDS? How representative are repair rates for the frequency of failure and non-conformance of OSTDS to standards? Are there categories (which) of systems that get repaired less frequently? Are there factors that are important such as soils, treatment effectiveness, and code conformance?</p>
Objectives and Outcomes	Determine the life expectancy of a septic tank and various kinds of drainfields.
Research Approach	<p>Review of permitting databases. Follow-up on data sources used in 1998 study. Statistical analysis to identify predictors/confounders.</p> <p>Follow-up on the systems that were part of Marion county's assessment (50 systems were tracked in 1992, 1993, and 1996)</p>
Potential Collaboration	<p>Repair evaluation gathering tool by Bureau</p> <p>Statewide or county inspection programs (depending on existence)</p>
Duration	1 year
Estimated Budget (\$)	\$50,000 (university student project; some field work to assess systems)
Ease of Implementation	Medium (initially heavy involvement in gathering and preparing databases, later depending on who does the work)
Comments	

PROJECT DESCRIPTION RANKED PROJECT #4	
Project Title	Drip Disposal With Septic Tank Quality Effluent
Proposed By	Sam Averett
Background	This is being done in other states, with a back washing filtering system. This is generally a more thorough back washing approach than the filter surface flushing that appears to be usually used with more pretreated effluent in Florida.
Objectives and Outcomes	Determine the effectiveness of permitting drip disposal using septic tank quality effluent. Determine maintenance requirements and how these can be assured.
Research Approach	<ul style="list-style-type: none"> ● Perform a literature review to see what research has already been conducted on this topic. ● Develop a project plan to address outstanding research issues. One possibility could be to allow several systems to be installed and monitor them yearly and in 5 years If it works allow wide spread use.
Potential Collaboration	The passive nitrogen project anticipates some evaluation of this approach at the test center. The Keys OWNRS-study included a couple of such systems, and perhaps up to half a dozen systems appear to have been permitted this way before pretreatment by PBTS or ATU became standard.
Duration	5 years (could be shorter)
Estimated Budget (\$)	Up to \$100,000 depending on results of literature review.
Ease of Implementation	Medium effort, most of the work can be contracted out with staff involvement in project oversight, procurement of contracts (will be through an ITN), and contract administration.
Comments	There are several of these units on the market right now; let them into the state and make them warranty the system. If this was approved it could be a less expensive way to upgrade existing systems, and get them out of the water table. Because of the height reduction and footprint, it could be a better choice than a conventional drainfield.

PROJECT DESCRIPTION RANKED PROJECT #5	
Project Title	Correlations Between Water Quality, OSTDS, and Health Effects
Proposed By	Eberhard Roeder
Background	<p>Many field studies are very site specific, focusing on single OSTDS. Different approaches can be used to assess quantify broader questions about environmental and public health impacts of OSTDS.</p> <p>A 1999 cohort study on an association of Giardiasis and Shigellosis 1994-1996 with the location of repair permits relative to a cohort of functional (systems without a repair permit) was inconclusive, in part due to small sample sizes.</p> <p>In 2005 several FAMU interns gathered data on the public health effects of OSTDS with a focus on drinking water wells.</p> <p>In another project, reported failures, as indicated by repair permit issuance, of onsite sewage systems statewide show a seasonal pattern, with a peak during the first quarter of a year. Variations in environmental conditions, system usage, funding or reporting are possible explanations.</p>
Objectives and Outcomes	Perform an analysis using a geographic information system (GIS) of any correlations between water quality in drinking water wells, OSTDS, and health effects.
Research Approach	<p>Gather data and put into a GIS database / map. A key question will be what data are available.</p> <p>Analyze the data to see if any correlations exist.</p> <p>Produce a final report.</p>
Potential Collaboration	<p>Environmental Public Health Tracking programs at CDC and DOH may have related databases and project expertise.</p> <p>The Bureau of Water Programs has information on some private wells.</p> <p>A University program with GIS and/or public health expertise</p>
Duration	1-year
Estimated Budget (\$)	Depending on the final approach, the budget could be approximately \$5,000 if conducted in house to \$30,000 if contracted out.
Ease of Implementation	Medium to high effort depending on if the work will be conducted in house or contracted out. Staff involvement will be considerable in either case for project oversight and Florida OSTDS data gathering.
Comments	



Department of Health
Bureau of Onsite Sewage Programs
Research Review and Advisory Committee

Tuesday April 10, 2012
10:00 am - 2:15 pm



Agenda:

- Introductions and Housekeeping
- Review Minutes of Meeting January 4, 2012
- Carmody Database System Update
- Nitrogen Study Update
 - Funding update
 - Discussion on draft Legislative Status Report
- Update on 319 Grant
- Research Budget Update and Project Funding Priorities
- Other Business
- Public Comment
- Closing Comments, Next Meeting, and Adjournment



Introductions & Housekeeping

- Roll call
- Identification of audience
- How to view web conference
- DO NOT PUT YOUR PHONE ON HOLD!!!!
- Download reports:

<http://www.myfloridaeh.com/ostds/research/Index.html>



Introductions & Housekeeping

There have been no changes to the committee composition since the January meeting



Review Minutes of Meeting January 4, 2012

- See draft minutes



Carmody Database System Update

- Presented by Scott Carmody



Florida Onsite Sewage Nitrogen Reduction Strategies Study

Purpose: Develop passive strategies for nitrogen reduction that complement use of conventional onsite sewage treatment and disposal systems, and further develop cost-effective nitrogen reduction strategies



Florida Onsite Sewage Nitrogen Reduction Strategies Study

- The House and Senate budget includes \$1,500,000 in budget and cash for continuation of the study
- Budget has not yet been sent to the Governor for review



Florida Onsite Sewage Nitrogen Reduction Strategies Study

- Legislative Status Report due on May 16, 2012 to the Governor, Speaker of the House, and President of the Senate



Florida Onsite Sewage Nitrogen Reduction Strategies Study

- Switch to Draft Legislative Report



Florida Onsite Sewage Nitrogen Reduction Strategies Study

Progress since last meeting:

- Completion of monitoring of mound system at GCREC
- Task B Wakulla County two field site sample events
- Task C Seminole County field site sample event and another field site selection property owner agreement (Polk County)
- Task D Simple and Complex soil tool progress reports submitted and reviewed by staff



319 Project on Performance and Management of Advanced Onsite Systems

Purpose: Assess water quality protection by advanced OSTDS throughout Florida

Progress:

- Granting period is now complete
- Final invoice sent to DEP in 2011
- Final report submitted for Monroe Diurnal and Seasonal Variability of Advanced Systems
- Final report submitted for Database of Advanced Systems



319 Project on Performance and Management of Advanced Onsite Systems

Progress cont. :

- Data Entry:
 - Data entry is ongoing with several bureau staff assisting
 - As of 4/5/12:
 - o 220 systems need data entry
 - o 399 systems need a quality control review



319 Project on Performance and Management of Advanced Onsite Systems

Progress cont. :

- Management Practices
 - Database was created linking program evaluations over past 10 years with survey results for regulators and system owners/users
 - Analysis has been done and will be summarized in the final task report
 - Linking between this database and the sample results will also be done and summarized in the final task report



319 Project on Performance and Management of Advanced Onsite Systems

Progress cont. :

- Final Project Report
 - Anticipated to be written after all data entry and data analysis has been completed
 - Draft report to be presented to RRAC for review prior to finalization and submission to DEP



Research Budget Update

Fiscal Year 2011-2012 (as of 3/27/2012):

Total Revenue	\$41,400
Total Expenditures	\$53,070
Ending Cash Balance (as of 3/27/2012)	\$470,785

Fiscal Year 2010-2011:

Total Revenue	\$55,738
Total Expenditures	\$76,156



Project Funding Priorities

Alternative Drainfield Product Assessment

- Compare the functioning of alternative drainfield materials to standard aggregate
- Originally approved in 2006 - contract issued but canceled due to industry concerns
- Re-prioritized in 2008
- Split into 3 phases:
 - Phase I: evaluate existing data (cost = staff time)
 - Phase II: create advisory group (manufacturers, contractors, CHD's) to find ways to fill data gaps
 - Phase III: gather data to fill the data gaps
- RRAC directed staff in 2010 to start Phase I, some work has been done but most of staff time has been devoted to other projects



Project Funding Priorities

Columbia County Well Sampling

- Determine whether pathogens and nutrients in well water on river-front lots are elevated and effected by either river or septic system influences, and whether there is any seasonal variability in this
- This project has been approved by RRAC every budget cycle since 2007
- Cost: \$5,000
- In the past, there were issues in finding a lab. Cost is for lab analysis only.



Project Funding Priorities

Continuation of Inventory of OSTDS in Florida

- Update 2009 inventory and develop method to automate this process
- Prioritized in 2011: #1 Ranked project
- Approach: see project description
- Budget: \$150,000 over 1-2 years
- Most of the tasks will cost money, very little can be done by research program staff



Project Funding Priorities

Effectiveness of Outlet Filters

- Determine whether outlet filters are performing as expected, determine maintenance frequency, and determine whether approval standards are adequate
- Prioritized in 2011: #2 Ranked project
- Approach: see project description
- Budget: Phase I: \$35,000
- NSF has established a task group to address outlet filter concerns (Sept 2011)
- Surveys could be developed, distributed, and analyzed by staff with RRAC input



Project Funding Priorities

Life Expectancy of Onsite Systems

- Determine life expectancy of a septic tank and various kinds of drainfields
- Prioritized in 2011: #3 Ranked project
- Approach: see project description
- Budget: \$50,000
- Much of this project could be done by staff, will be time intensive



Project Funding Priorities

Drip Disposal with Septic Tank Quality Effluent

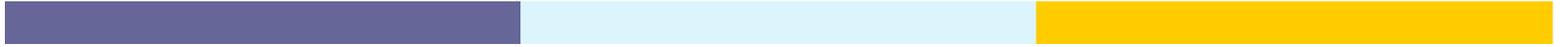
- Determine the effectiveness of permitting drip disposal using septic tank quality effluent. Determine maintenance requirements.
- Prioritized in 2011: #4 Ranked project
- Approach: see project description
- Budget: Up to \$100,000
- Nitrogen Reduction Strategies Study is testing this at the test center
- Literature review of existing research could be done



Project Funding Priorities

Correlations Between Water Quality, OSTDs, and Health Effects

- Perform an analysis using GIS of any correlations between water quality in drinking water wells, OSTDs, and health effects
- Prioritized in 2011: #5 Ranked project
- Approach: see project description
- Budget: \$5,000 if conducted in house
- Staff could gather and analyze data. This will be a time intensive project.



Other Business



Public Comment



Next Meeting

Upcoming meeting topics:

- Discussion on 319 grant report on the performance of advanced OSTDS in Florida
- Discussion on process forward with research priorities

Proposed dates for next meeting:

- Will send email to RRAC at a future date to determine next meeting



Closing Comments and Adjournment