

PALM BEACH COUNTY
BOARD OF COUNTY COMMISSIONERS
AGENDA ITEM SUMMARY

Meeting Date: April 3, 2012 (X) Consent () Regular
() Workshop () Public Hearing

Department

Submitted By: Environmental Resources Management
Submitted For: Environmental Resources Management

I. EXECUTIVE BRIEF

Motion and Title: Staff recommends motion to:

A) **approve** Task Order No. 1296-07 to a continuing Contract (R2010-1296) with Applied Technology & Management (ATM) in the amount of \$233,094 for engineering services for a pilot project to reduce phosphorus in Pine Lake, the northernmost of the Chain of Lakes;

B) **adopt** Resolution authorizing the Clerk of the Board to disburse \$151,547 from the Vessel Registration Fee Trust Fund for the Phoslock Project; and

C) **approve** Budget Transfer of \$151,547 from the Vessel Registration Fee Trust Fund for the Task Order(\$116,547) and Contingency and Start-up costs (\$35,000).

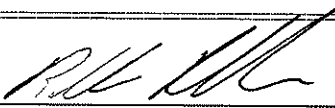
D) **authorize** the County Administrator or his designee to sign all future time extensions, task assignments, certifications, and other forms associated with the Contract, and necessary minor amendments that do not change the scope of work or terms and conditions of the Contract.

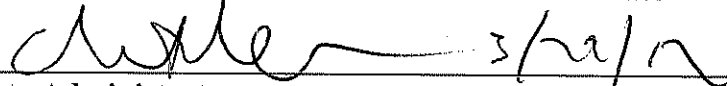
Summary: The BCC approved the Contract with ATM, a Palm Beach County company, on August 17, 2010 (R2010-1296). This Task Order No. 1296-07 authorizes ATM to oversee the services of a subcontractor (AMEC) who will manage the surface application of a compound (Phoslock) that will bind phosphorus and reduce pollution levels of Pine Lake. There is 0% Small Business Enterprise (SBE) participation on the Task Order. ATM committed to an overall 15% SBE participation in the Contract and has achieved 26.5% participation with this Task Order. The work is funded by the Environmental Restoration Program and the Vessel Registration Fund, a non-ad valorem source. The Task Order is scheduled to be complete December 31, 2012. District 2 (JM)

Background and Justification: Pollution of freshwater lakes is an ongoing problem with state and federal agencies currently proposing new standards for nutrients. The overall goal is to reduce the amount of nutrients discharged to the surface waters which ultimately affect downstream water bodies including Lake Worth Lagoon and the ocean. This project will demonstrate and monitor a new technology for reducing phosphorus in Pine Lake, which has been deemed impaired by the FDEP. This impairment can trigger costly stormwater treatment measures in upstream sources. The goal of this project is to apply Phoslock to bind the phosphorus in the water and sediment, monitor the water quality, and determine the reduction in phosphorus levels.

Attachments:

- 1. Task Order No. 1296-07 with Contract History
- 2. Contract (pages 1, 19, Exhibit B Fee Schedule)
- 3. Resolution
- 4. Budget Transfer (1223)

Recommended by:  3/15/12
Department Director Date

Approved by:  3/12/12
County Administrator Date

II. FISCAL IMPACT ANALYSIS

A. Five Year Summary of Fiscal Impact:

| Fiscal Years | 2012 | 2013 | 2014 | 2015 | 2016 |
|--|------------------|-------|-------|-------|-------|
| Capital Expenditures | _____ | _____ | _____ | _____ | _____ |
| Operating Costs | <u>\$268,094</u> | _____ | _____ | _____ | _____ |
| External Revenues | _____ | _____ | _____ | _____ | _____ |
| Program Income (County) | _____ | _____ | _____ | _____ | _____ |
| In-Kind Match (County) | _____ | _____ | _____ | _____ | _____ |
| NET FISCAL IMPACT | <u>\$268,094</u> | _____ | _____ | _____ | _____ |
| # ADDITIONAL FTE POSITIONS (Cumulative) | _____ | _____ | _____ | _____ | _____ |

Is Item Included in Current Budget? Yes _____ No X

Budget Account No.: Fund _____ Department _____ Unit _____ Object _____

Program _____

B. Recommended Sources of Funds/Summary of Fiscal Impact:

Environmental Restoration Program: (3654) 381-E111 - E3401 \$116,547
 Vessel Registration Fee: Freshwater (Transfer from Reserve 1223) \$151,547
 380 - 3091 - E3401 \$268,094

C. Department Fiscal Review:

[Signature]

III. REVIEW COMMENTS

A. OFMB Fiscal and /or Contract Dev. and Control Comments:

Fiscal impact is \$25,000 greater than contract amount for costs to be incurred by County such as permit fees.

OFMB

Contract Development and Control

B. Legal Sufficiency:

[Signature] 3/28/12
 Assistant County Attorney

This item complies with current County policies.

C. Other Department Review:

 Department Director

TASK ORDER

TASK ORDER: 1296-07 CONSULTANT: Applied Technology & Management
1223-380-3091-3401 #116,547
ACCOUNT: 3654-380-E111-3401 #116,547 CONTRACT: R2010-1296

[Fiscal approval of Budget Availability: Liz Purcell]

PROJECT MANAGER: Paul Davis PHONE: 561-233-2509

CONTRACT MANAGER: Juan Cueto PHONE: 561-233-2431

PROJECT NAME: Phoslock Demonstration Project

LOCATION/DISTRICT #: West Palm Beach / District 2

TASK DESCRIPTION (use additional pages if necessary): The Consultant shall perform professional services to conduct a phoslock study in Pine Lake, as described in the attached proposal dated March 12, 2012.

DELIVERABLES: See scope of work.

TASK ORDER TYPE: FIXED PRICE \$48,816.00 DUE DATE: 12/31/2012
NOT-TO-EXCEED \$184,278.00

TOTAL AMOUNT \$ 233,094.00 See attached spreadsheet dated 3/12/12

(Check where appropriate)

for Contract and Subcontract Amounts:

| | Black | Hispanic | Women | Other (specify) | White Male |
|--|----------|----------|----------|-----------------|------------|
| M/WBE (State) <input type="checkbox"/> | \$ _____ | \$ _____ | \$ _____ | \$ _____ | |
| SBE-M/WBE* <input type="checkbox"/> | \$ _____ | \$ _____ | \$ _____ | \$ _____ | |
| SBE <input type="checkbox"/> | \$ _____ | \$ _____ | \$ _____ | \$ _____ | \$ _____ |

*certified as both an SBE and a State MBE

TOTAL SBE-M/WBE PARTICIPATION: \$ 0.00

CONSULTANT REP: [Signature] DATE: 3/13/12

APPROVED AS TO TERMS AND CONDITIONS:

ERM DIRECTOR/DEPUTY: [Signature] DATE: 3/15/12

APPROVED AS TO FORM AND LEGAL SUFFICIENCY:

ASSISTANT COUNTY ATTORNEY: [Signature] DATE: 3/28/12

BOARD OF COUNTY COMMISSIONERS: _____ DATE: _____
Shelley Vana, Chair



2047 VISTA PARKWAY, SUITE 201
WEST PALM BEACH, FL 33411

TEL: 561-659-0041
FAX: 561-659-3733

www.appliedtm.com

RECEIVED
MAR 13 2012
ENVIRONMENTAL RESOURCES MANAGEMENT

March 12, 2012

Paul Davis
Palm Beach County Env. Resources Mgmt.
2300 N. Jog Rd.; 4th Floor
West Palm Beach, FL 33411-2743

RE: Phoslock Demonstration Project
Project Proposal

Dear Mr. Davis:

Please find attached our proposal for the above referenced project. This effort will be conducted with primary support provided by AMEC as a sub-consultant to ATM. Their proposal and Scope of Work is provided as an attachment to this letter in addition to ATM's cost summary.

ATM will provide administrative and supervisory support to this effort consistent with Article 4.F.2. of our contract for professional consultant services with Palm Beach County (dated August 17, 2010).

All tasks with the exception of Task 6 will be conducted on a Lump Sum basis for a cost of \$48,816. Task 6 will be conducted as a Not-To-Exceed Amount of \$184,278 for a total cost Not-To-Exceed \$233,094.

Should you have any questions regarding this proposal, please feel free to contact me at your convenience.

Sincerely,

Applied Technology & Management, Inc.

Michael G. Jenkins, Ph.D., P.E.
Coastal Engineering Team Leader

Attachment: as noted

ATM COST SUMMARY
Phoslock Demonstration Project
 ver. 3/12/2012

| TASK DESCRIPTION | Coastal Team Leader | Coastal Engineer | Jr. Engineer / Engineer Technician | Sr. CADD/GIS | Sr. Admin/Tech. Editor | ATM Total Labor | Sub consultants | Sub Fee (5%) | Total Task Budget |
|--|---------------------|------------------|------------------------------------|--------------|------------------------|-----------------|-----------------|--------------|-------------------|
| Contract Labor Rates - 2011 | \$155.58 | \$123.23 | \$76.44 | \$71.71 | \$73.16 | | | | |
| Administrative and Supervisory Support | | | | | | | | | |
| Project Tasks 1-5,7,8 (Lump Sum) | | | | | | \$0.00 | \$46,491 | \$2,325 | \$48,816 |
| Project Task 6 (Not-To-Exceed) | | | | | | | \$175,503 | \$8,775 | \$184,278 |
| TOTAL TASKS 1-8 | | | | | | | | | |
| TOTAL ATM FEES (LABOR & ODC's): TASKS 1 THROUGH 8 | \$0.00 | \$0.00 | \$0.00 | \$0.00 | \$0.00 | \$0.00 | \$221,994 | \$11,100 | \$233,094 |

SubConsultant Summary

| FIRM | TASKS | TOTAL COST |
|------------------|-------|-------------------|
| AMEC | 1-8 | \$ 44,634 |
| TestAmerica | 3 | \$ 6,186 |
| DB Environmental | 3 | \$ 1,050 |
| SoPRO | 6 | \$ 150,204 |
| Clearwaters | 6 | \$ 19,920 |
| TOTAL | | \$ 221,994 |



February 28, 2012

Dr. Michael Jenkins, PE
Applied Technology & Management, Inc.
2047 Vista Parkway, Suite 201
West Palm Beach, Florida 33411

Subject: Palm Beach County Phoslock™ Demonstration Project

Dear Dr. Jenkins,

AMEC Environmental & Infrastructure, Inc. is pleased to provide the attached proposal for professional services involving the Phoslock™ demonstration project that will be conducted in Pine Lake, in Palm Beach County, Florida.

Our scope of work, timeline, and costs are summarized in detail in the proposal. The work to be performed by our subcontractors is also summarized in the proposal, and in separate cost proposals provided by those firms which are attached.

We appreciate the opportunity to assist you with these services. If you have any questions, please feel free to contact me at (863) 667-2345. Dr. Gerold Morrison, our project manager, can be reached at (863) 640-2385.

Sincerely,
AMEC Environment & Infrastructure, Inc.

A handwritten signature in black ink, appearing to read "W. Reigner".

Walter R. Reigner, PE, CPESC
Vice President

A handwritten signature in black ink, appearing to read "Gerold Morrison".

Gerold Morrison, PhD
Sr. Water Resources Scientist

Attachments: Proposal Material

AMEC
Environmental & Infrastructure
2000 E. Edgewood Drive, Suite 215
Lakeland, Florida
USA 33803
Tel (863) 667-2345
Fax (863) 667-2662

www.amec.com



AMEC Cost Proposal

Palm Beach County Phoslock™ Demonstration Project

Background:

The goal of this project is to reduce levels of bioavailable phosphorus (BAP) in Pine Lake, the northernmost of Palm Beach County's Chain-of-Lakes (Fig. 1). Phosphorus reduction will be achieved by applying Phoslock™, a lanthanum-modified bentonite clay. Phosphorus is a key nutrient that plays critical roles in the survival, growth and reproduction of plant and animal cells. When present at elevated levels, however, it becomes a pollutant. This is particularly true in lakes and other fresh water bodies, where phosphorus enrichment due to anthropogenic sources such as stormwater and wastewater discharges can lead to nuisance algae blooms, erratic fluctuation in dissolved oxygen levels, fish kills, and other water quality problems.

Palm Beach County contains a number of water bodies that are exhibiting symptoms of phosphorus enrichment. Several, including Pine Lake, do not meet existing state and federal water quality criteria, and are therefore designated as "impaired" by the Florida Department of Environmental Protection (FDEP) and the U.S. Environmental Protection Agency (USEPA). More stringent criteria, some of which have already been proposed by USEPA and others that are currently being developed, are likely to increase the number of impaired water bodies in the near future. The federal Clean Water Act requires local governments and other NPDES permit-holders to take timely and appropriate actions to address such impairments.

Phoslock™ was developed by an Australian government agency (the Commonwealth Scientific and Industrial Research Organization [CSIRO]) to deal with these types of phosphorus-related water quality issues. It does so by binding BAP over a wide range of dissolved oxygen and pH conditions, making the phosphorus unavailable to phytoplankton and other aquatic organisms. Phoslock™ has been used successfully to improve water quality in numerous phosphorus-impaired water bodies in Australia, New Zealand, China, South Africa, Germany, the Netherlands, the United Kingdom, Canada and California.

Additional background information on the product is provided in Attachment 1, a summary prepared by BCI Engineers and Scientists, Inc. (prior to its acquisition by AMEC) in January, 2011. Summary information on a number of lake and river restoration projects is also available online at <http://www.phoslock.com.au/case-studies-usa.php> and <http://www.phoslock.com.au/technical-usa.php>. Phoslock™ has not yet been applied in Florida, and this project thus represents the initial use of the product as a water quality management tool in Florida waters.

Assumptions:

The scope of work and cost schedule included in this proposal are based on the following assumptions:

- The County will increase the frequency of the water quality monitoring it performs in Pine Lake from bimonthly to monthly. Monthly monitoring will also be conducted in at least one additional lake within the Chain-of-Lakes, to provide information from an untreated water body which can be used to evaluate the effectiveness of the Pine Lake Phoslock™ application;



Fig. 1. Location of the Pine Lake project site.

- Water quality parameters monitored will include phosphorus forms (SRP and TP), nitrogen forms (TKN, ammonium N, and nitrate+nitrite N), chlorophyll *a* (corrected for pheophytin), total alkalinity, color, TSS, turbidity, and vertical profiles of standard hydrographic parameters (water temperature, DO, pH, and specific conductance).
- The County will conduct the water and sediment sampling and other data collection activities described in Task 3a, to provide the information needed to estimate the concentrations and masses of BAP present at the two project sites;
- The County will perform all permit compliance monitoring associated with the project, and will provide the resulting data to AMEC for inclusion in the final project report. The scope of the monitoring effort will be determined by the regulatory agencies during the permitting process, but could potentially include a biological component (e.g., benthic monitoring) as well as standard water and sediment chemistry elements; and
- If laboratory toxicity testing is required by the regulatory agencies as a permit condition, those tests will be funded by the County. If required, this will be funded through an amendment to the project Task Order, authorizing AMEC to obtain the services of a laboratory to perform the toxicity testing. The County will collect any necessary samples and ship them to the selected laboratory.

Lanthanum binds phosphate ions through a stoichiometric chemical process, and 100 grams of Phoslock™ contains a sufficient amount of lanthanum to bind approximately one gram of BAP. In order to determine the amount of Phoslock™ to apply to a given water body, one must first calculate the overall mass of BAP that is present, and the reductions in BAP that are needed to meet regulatory requirements or achieve other project objectives.

Phosphorus is present in lake water and sediments in a number of different chemical forms. Some of these forms, such as soluble reactive phosphorus (SRP), are immediately bioavailable. Others, such as iron-bound P or organic P in decomposing plant or animal cells, can be converted to BAP at certain DO or pH levels or over time through biogeochemical remineralization processes. Other forms such as Ca- and Mg-bound P, and refractory organic P, are essentially unavailable for biological uptake under most environmental conditions.

Estimating the mass of BAP that will be present in a given water body at a given time, and calculating the appropriate Phoslock™ dose to address it, thus involve several sources of uncertainty. The data collection and dose calculation methods that will be used in this project are described below, and are based on standard operating procedures (SOPs) recommended by Phoslock Water Solutions, Ltd. (PWS), the manufacturer of the Phoslock™ product. An example of those SOPs, which was developed by the Lake Simcoe Region Conservation Authority and the Ontario Ministry of the Environment, working in conjunction with PWS, is provided in Attachment 2.

Because of these pre-application data collection and computation requirements, the budget for a Phoslock™ project is normally developed through a two-step process:

- (1) collect field and laboratory data to quantify the mass of BAP that is present in the water column and sediments of the target water body; and
- (2) calculate the amount of Phoslock™ that will be needed to reduce the mass of BAP within the water body to desired levels.

For this project, however, the County has requested that a detailed budget be developed before these steps have been carried out. In order to meet this request, a range of potential Phoslock™ application rates has been estimated for the project site using the limited information that is currently available.

For budget planning purposes, the County has also requested information on the maximum amount of Phoslock™ that could potentially be needed for the Pine Lake application, along with maximum (“not-to-exceed”) costs that would be associated with that application rate. We have used the upper end of the estimated range of potential Phoslock™ dose rates to develop these not-to-exceed costs, which are summarized in Task 6. **Task 6 (Phoslock™ application) will thus have a not-to-exceed budget amount, while all other tasks in the project shall be budgeted as lump sum.**

Estimation of Potential Maximum (Not-to-Exceed) Phoslock™ Dose Rates

For the Pine Lake site, the potential range of Phoslock™ dose rates was estimated using data provided by the Department of Environmental Resources Management (ERM). Sediment sampling conducted for ERM during 2000 and 2001 indicated that total phosphorus (TP) levels in the upper 10 cm of the lake’s sediments during those years were approximately 255 mg TP/kg dry weight. Saloid-bound and iron-bound P forms, which are readily bioavailable, made up about 5% of the total. Annual mean TP concentrations in the water column were approximately 0.06 mg/L during the 2000 – 2001 sampling period, and have fluctuated around that value in recent years (see Attachment 3). Chlorophyll-*a* concentrations in the water column have fluctuated between 10 and 80 µg/L during the years 2000 through 2011, with an overall mean of 34.6 µg/L (Attachment 3).

Given the reported P concentrations and the size of the lake (surface area ≈ 35 acres, volume ≈ 225 acre-feet), it appears that the mass of bioavailable phosphorus in the water column and sediments during the

2000-2001 study period was approximately 210 kg. Binding this amount of P would require approximately 21 metric tons of Phoslock™.

The available sediment data from Pine Lake were collected 10 years ago, however, and it is possible that bioavailable P levels in the sediments have increased substantially during the intervening period. The maximum potential application rate and not-to-exceed cost estimates provided in Task 6 assume that bioavailable P levels in the lake may have doubled since 2001, to 420 kg. Binding this amount of P would require a Phoslock™ dose rate of 42 metric tons, or about 1.2 metric tons/acre. This maximum (not-to-exceed) value is slightly higher than the average dose approximately 1.0 metric tons/acre that has typically been used to treat highly eutrophic lakes in other parts of the world.

Updated sediment chemistry data will be collected from Pine Lake, and updated estimates of bioavailable P levels will be calculated, during Task 3a of this project. That information, along with information from laboratory jar tests (Task 3b), will be used to calculate (in Task 3c) the actual Phoslock™ dose that will be applied to the lake. It is anticipated that the actual dose will be lower than the 42 metric ton maximum value described above, which under the terms of the project agreement cannot be exceeded, and may be closer to the 21 metric ton dose suggested by the currently available water quality and sediment data.

Scope of Services

As noted in the SOP document, Phoslock™ projects typically include the following group of technical tasks:

- Pre-application site assessment, including collection and analysis of water and sediment samples
- Identification of project objectives
- Calculation of Phoslock™ dose rates
 - Quantification of BAP levels in water column and sediments
 - Jar tests
 - Dose rate determination
- Phoslock applications
- Collection and analysis of post-application water and sediment data
- Project summary report

Projects also include a number of administrative and coordination tasks, which typically vary from site to site, addressing issues such as project oversight and management, environmental permitting permit compliance monitoring, stakeholder outreach, preparation of standard summary reports, and preparation of any special reports or presentations requested by sponsoring organizations.

The specific set of tasks that will be completed for the Pine Lake Phoslock™ project are summarized in the following section.

Task 1. Kickoff Meeting

- a) **Purpose:**
 - Notify team members that the project is underway;
 - Outline project goals and the roles and responsibilities of team members;
 - Clarify expectations of the participating parties;
 - Confirm commitments from participants whose actions will determine the project's outcome.
- b) **Scope:** The meeting will include key participants identified by the County who have an interest in or potential effects on project outcomes. These typically include:

- the project team, consisting of County and AMEC staff who will be working together to produce project deliverables;
- the project sponsor who funds, administers, manages, monitors, and is responsible for the overall project; and
- representatives from other organizations whose roles and responsibilities can affect the project outcome.

With assistance from the County, AMEC staff will prepare the meeting agenda, identify and invite participants, prepare presentation materials, assist in on-site meeting setup, and take notes documenting key issues and decisions. The meeting agenda will include the following elements:

- Introductions
- Project purpose, scope, potential risks, major deliverables, timeline, and budget
- Roles and responsibilities of project team, sponsors and other participants
- Identification of key contacts and exchange of contact information
- Other issues/questions for group discussion

c) **Deliverable:** Meeting summary, in memorandum format

d) **Budget:** \$2,148 (lump sum)

Task 2. Literature Review

- a) **Purpose:** As requested by the County, this task will provide an overview of significant literature published on the Phoslock™ product, including its chemical and physical characteristics, effectiveness as a phosphorus management technology, impacts on aquatic organisms or human health, and potential role in assisting the County meet its water quality management goals for lakes, canals, and estuarine waters.
- b) **Scope:** To the extent possible given the availability of published information, the review will include the following elements:
- Laboratory and field studies of product effectiveness, cost, and environmental/human health impacts
 - Data involving product applications in temperate, subtropical and tropical water bodies (freshwater, estuarine and marine)
 - Biotic and abiotic factors that influence product effectiveness
 - Ecotoxicological studies involving benthic, epibenthic and demersal organisms
 - Human health studies; and
 - Palm Beach County water quality management plans.

The review will be based on standard electronic searches of technical publication and chain-of-citation databases, and consultation with authorities in the fields of limnology, lake management, and ecotoxicology. The electronic databases searched will include primary literature, secondary literature, gray literature, and internet sources.

For each publication/information source included in the review, a narrative description and tabular summary will be provided and those sources most relevant to South Florida waters will be identified.

- c) **Deliverable:** A technical memorandum summarizing the available literature regarding the physical and chemical characteristics and environmental and toxicological effects of the Phoslock™ product.

d) **Budget:** \$3,824 (lump sum)

Task 3. Calculation of Phoslock™ dose rates

Task 3a. Determination of BAP levels in water column and sediments

a) **Purpose:** Conduct sampling and laboratory analyses to quantify pre-treatment BAP levels in the water column and sediments of Pine Lake. Palm Beach County is responsible for collecting the water and sediment samples, hydrographic measurements and physical site measurements. AMEC and their subcontractors will be responsible for sample analysis, data analysis and writing the technical memorandum.

b) **Scope:**

i) **Water samples**

Sampling locations:

The lake will be divided into three similarly-sized segments, and a sampling site will be selected near the mid-point of each segment, to ensure that representative samples are collected from different portions of the water body.

Sample types and analytes:

Composite (near-surface to near-bottom) water samples will be collected from each sampling location and split into two sub-samples. One subsample will remain unfiltered and will be analyzed for total phosphorus (TP), total Kjeldahl nitrogen (TKN), chlorophyll-*a* (corrected for phaeophyton), turbidity (NTU), total alkalinity, and total lanthanum.

The other subsample will be filtered using a 0.45 µm membrane filter and the filtrate will be analyzed for dissolved nutrients (soluble reactive phosphorus [SRP], NH₄-N, NO₂₊₃-N), and dissolved lanthanum. Filtration will be performed on-site into previously acid-washed and DI-rinsed sample bottles.

Following collection, samples will be placed on ice and delivered immediately, either the same working day or via overnight delivery, to the nearest Test America analytical laboratory.

ii) **Sediment samples:**

Composite samples of the upper 5 cm of sediment will be collected from the same locations as the water samples, using a petite Ponar sampler. Following collection, samples will be placed on ice and delivered immediately, either the same working day or via overnight delivery, to DB Environmental, Inc., for phosphorus fractionation analysis using a modified Chang and Jackson procedure. The fractionation procedure is based on the differential solubilities of different inorganic P forms in different extracts. Ammonium chloride (NH₄Cl) is used first to remove soluble and loosely bound P, followed by the removal of Al-bound and Fe-bound P using NH₄F and separation of Fe-bound P with NaOH. Reductant-soluble P is removed using a CDB (sodium citrate-sodium dithionite-sodium bicarbonate) extraction, and Ca-bound P is extracted using H₂SO₄ or HCl. Of these P forms, the soluble, loosely bound and Fe-bound fractions are the most readily bioavailable.

iii) **Hydrographic measurements:**

Pre- and post-calibrated multiprobe instruments (e.g., Hydrolab®, YSI® or equivalent) will be used to measure the following water quality parameters at each sampling site:

- pH
- eH/ORP
- DO
- specific conductance
- temperature

Measurements will be recorded at 0.25 m vertical intervals, from 0.25 m below the water surface to 0.25 m above the sediment-water interface, to provide vertical profiles of each parameter

iv) **Physical site measurements:**

Necessary information on the surface area, volume and bathymetry of Pine Lake will be provided by the County.

- c) **Deliverable:** A technical memorandum summarizing the water and sediment chemistry data collected through this task, estimating the current mass of BAP present in the water column and sediments, and providing an initial estimate of the Phoslock™ dose rate needed to bind that mass of BAP.
- d) **Budget:** \$4,498 (lump sum)
(Note: This amount covers only project management, laboratory analysis, data analysis and reporting costs.)

Task 3b. Jar Tests

- a) **Purpose:** To perform laboratory bench-scale evaluations of the efficacy and water quality effects of a range of Phoslock™ dose rates (e.g., 0.5x, 1x, 2x) centered on the dose rate calculated in task 3a.
- b) **Scope:** Water samples from Pine Lake will be treated with a range of Phoslock™ dose rates, including the initial dose rates calculated above, doses of 0.5x and 2x those values, and undosed controls. Samples will be incubated under controlled laboratory conditions for 48 hours or until the Phoslock™ material has settled and turbidity in the treated samples has returned to pre-treatment levels. Pre-treatment and post-treatment aliquots will be collected and analyzed to quantify the effects of the Phoslock™ treatments on water quality parameters of interest. Parameters analyzed will include TP, SRP, total alkalinity, and total and dissolved lanthanum (La). Post-treatment aliquots will be collected 6 hrs, 24 hrs, and 48 hrs (or when turbidity returns to pre-treatment levels) following the addition of Phoslock™.
- c) **Deliverable:** A technical memorandum summarizing jar test methods and results.
- d) **Budget:** \$11,005 (lump sum)

Task 3c. Final dose calculations

- a) **Purpose:** Calculate the Phoslock™ dose rates that will be applied to Pine Lake, based on the information provided by tasks 3a and 3b.
- b) **Scope:** Based on the water and sediment data collected in task 3a, the results of the jar tests conducted in task 3b, and the County's goals for the project, dose rates will be calculated to determine optimal Phoslock™ application rates for the project site.
- c) **Deliverable:** A technical memorandum summarizing the final dose rate calculations and their results.
- d) **Budget:** \$1,264 (lump sum)

Task 4. Permitting

- a) **Purpose:** To prepare and submit an NPDES permit application to the Florida Department of Environmental Protection (FDEP) to apply the Phoslock™ product at the Pine Lake project site.
- b) **Scope:** Participate in pre-application meetings with County and FDEP staff, prepare permit application, and provide clarifications in response to FDEP requests for additional information (RAI) regarding the application.
- c) **Deliverables:** Pre-application information packet, completed permit application, responses to RAI (if necessary).
- d) **Budget:** \$6,264 (lump sum)

Task 5. Interim project review meeting

- a) **Purpose:** Review permit conditions, including monitoring requirements and other compliance issues, discuss project progress to date, and authorize the remaining tasks.
- b) **Scope:** This meeting will include the same participants as the project kickoff meeting (project team, sponsors, and other key participants). With assistance from the County, AMEC staff will prepare the meeting agenda, invite participants, prepare presentation materials, assist in on-site meeting setup, and take notes documenting key issues and decisions. The meeting agenda will include the following elements:
 - o Introductions
 - o Review of project purpose, scope, potential risks, major deliverables, timeline, and budget
 - o Summary of project progress (e.g., literature review, water and sediment sampling, jar tests results, Phoslock™ dose rate calculations)
 - o Summary of unanticipated problems
 - o Summary of permit conditions
 - o Summary of roles and responsibilities of team members and other participants in upcoming project tasks
 - o Other issues/questions for group discussion
 - o Authorization to proceed with remaining tasks.

c) **Deliverable:** Meeting summary, in memorandum format

d) **Budget:** \$3,812 (lump sum)

Task 6. Phoslock Application

a) **Purpose:** Apply the Phoslock™ product.

b) **Scope:** Based on the recommended product dose rates developed in Task 3, or a modified rate developed through the permitting process, the Phoslock™ product will be applied to the project site. The product will be applied in either granular or slurry form (see Attachment 1), based on site-specific conditions, permit requirements, and the County's water quality objectives for the site. Applications will be made by SePRO Corp., the firm that has been selected by PWS as the U.S. distributor and applicator of the Phoslock™ product (<http://www.sepro.com/default.php?page=newsdetail&newsid=02012011>).

c) **Deliverables:** Completed Phoslock™ application for each site, in compliance with any relevant permit conditions, and a technical memorandum summarizing the application process.

d) **Budget (maximum not-to-exceed amount, requested by County):** \$175,503 (not-to-exceed)

Task 7. Analysis and reporting of permit compliance data

a) **Purpose:** Analyze and provide a report summarizing the monitoring data collected to ensure compliance with any project-related permit(s).

b) **Scope:** It is assumed that a minimum of 6 months of permit compliance monitoring (e.g., of phosphorus forms, lanthanum and other water chemistry parameters) will be required as part of the FDEP permitting process, and that this monitoring will be performed by the County.

Following completion of the post-application monitoring process, AMEC will analyze the monitoring data provided by the County, and prepare a concise memorandum summarizing the data.

c) **Deliverable:** Technical memorandum summarizing permit compliance data.

d) **Cost:** \$3,912 (lump sum)

(Note: This amount covers data analysis and report preparation costs only. It is assumed that the County will perform all permit-related sample collection and laboratory analyses. Lanthanum analyses, which cannot be performed by the County laboratory, will be outsourced to a contract laboratory at a cost of \$60 per sample.)

Task 8. Project Report and Presentation

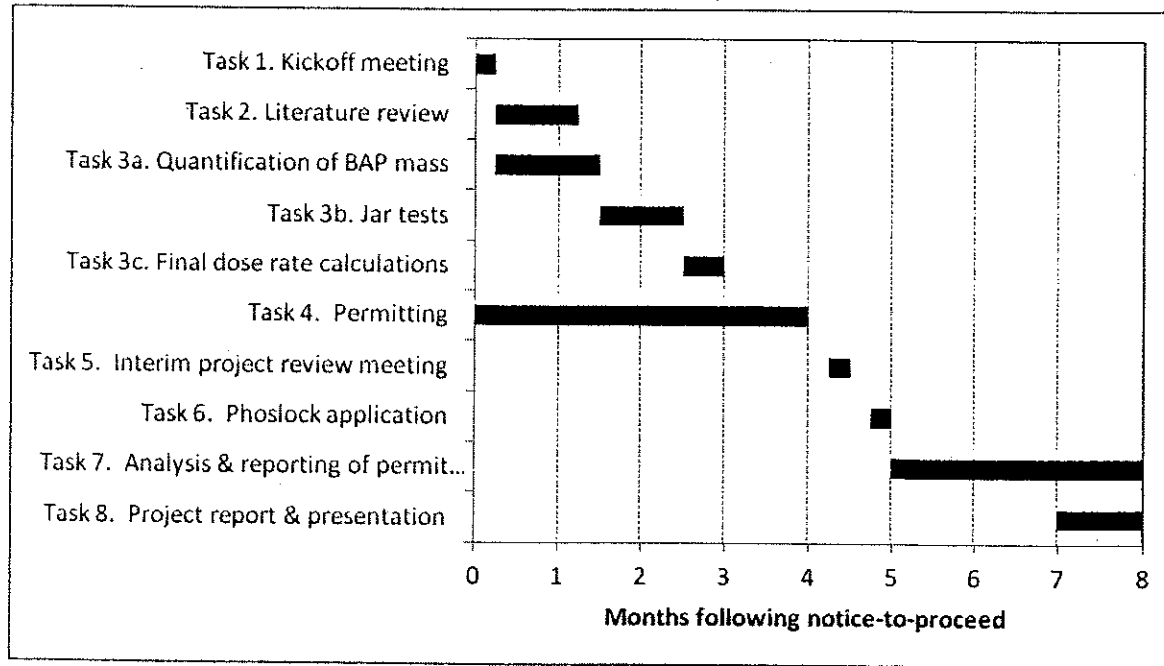
a) **Purpose:** Provide a summary report describing project objectives, methods, results and recommendations.

- b) **Scope:** Following completion of the post-application monitoring process, AMEC will prepare a summary report documenting the objectives, methods and results of the project, along with recommendations regarding future reapplication intervals, and design considerations, cost effectiveness compared to other processes, and feasibility of applying Phoslock™ to other County waters. A draft will be provided to the County for review, and the report will be finalized by addressing the County's review comments. AMEC will also provide a presentation summarizing key features and results of the project to the County and interested stakeholders.
- c) **Deliverables:** Draft and final project summary report; presentation summarizing key project objectives, methods, results and recommendations. Five hard copies of the final report will be provided along with associated Word, Excel, Powerpoint and PDF files.
- d) **Budget:** \$9,764 (lump sum)

Total (Not-to-Exceed) Cost, Tasks 1 through 8: \$221,994¹

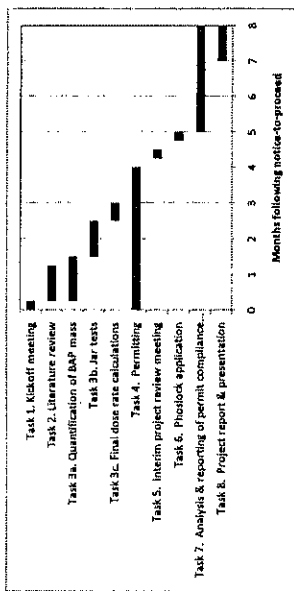
¹ Note: This value is based on a maximum potential (not-to-exceed) Phoslock™ dose rate, as requested by County

Timeline for Tasks 1 through 8:



| Palm Beach County Pine Lake Phoslock Project Proposed Budget | | | | | | | | | | | | | | | | | | |
|---|---|-------------------------|-------|--|-------|----------------------------------|-------|--------------------------------------|-------|---------------------------------|-------|----------------------------------|-------|--------------------|----------|---------|-----------|-----------|
| Task | Description | Principal W. Reinger | | Associate / Project Mgr G. Morrison | | Senior Proj. II S. Whitecheck | | Sr. Principal AMEC Biol Lab Staff | | Sr. Tech AMEC Biol Lab Staff | | Staff Professional I A. Brian | | Admin H. Martin | | Totals | | |
| | | Hr. Rate | Hours | Hr. Rate | Hours | Hr. Rate | Hours | Hr. Rate | Hours | Hr. Rate | Hours | Hr. Rate | Hours | Hr. Rate | Hours | Cost | Hours | Cost |
| Task 1. Kickoff meeting | Labor | \$ 400 | 7 | \$ 1,106 | | | | | | | | | | 3 | \$ 1,174 | 12 | \$ 1,680 | |
| | Reimbursables - AMEC Travel | | | | | | | | | | | | | | | | \$ 468 | |
| | Subtotal | | | | | | | | | | | | | | | | \$ 2,148 | |
| Task 2. Literature Review | Labor | | 1 | \$ 200 | 20 | \$ 3,160 | | | | | | | | 8 | \$ 464 | 29 | \$3,024 | |
| | Subtotal | | | | | | | | | | | | | | | | \$3,024 | |
| TASK 3. Dose Rate Calculation | Labor | | 1 | \$ 200 | 14 | \$ 2,812 | | | | | | | | 2 | \$ 116 | 17 | \$2,528 | |
| | Reimbursables - Laboratory analyses (Tes/Amb. DE) | | | | | | | | | | | | | | | | \$1,870 | |
| | Subtotal | | | | | | | | | | | | | | | | \$4,498 | |
| Task 3b. Jar Tests | Labor | | 1 | \$ 200 | 6 | \$ 948 | | | | | | | | 2 | \$ 116 | 64 | \$5,738 | |
| | Reimbursables - Laboratory analyses | | | | | | | | | | | | | | | | \$5,265 | |
| | Subtotal | | | | | | | | | | | | | | | | \$11,003 | |
| TASK 3c. Final Dose Rate Calculations | Labor | | 1 | \$ 200 | 6 | \$ 948 | | | | | | | | 2 | \$ 116 | 9 | \$1,264 | |
| | Subtotal | | | | | | | | | | | | | | | | \$1,264 | |
| Task 4. Permitting | Labor | | 4 | \$ 800 | 12 | \$ 1,896 | 16 | \$ 2,368 | | | | | | 8 | \$ 736 | 48 | \$5,284 | |
| | Subtotal | | | | | | | | | | | | | | | | \$5,284 | |
| Task 5. Interim Project Review Meeting | Labor | | 4 | \$ 800 | 15 | \$ 2,370 | | | | | | | | 3 | \$ 174 | 22 | \$3,344 | |
| | Reimbursables - AMEC Travel | | | | | | | | | | | | | | | | \$468 | |
| | Subtotal | | | | | | | | | | | | | | | | \$3,812 | |
| Task 6. Phoslock Applications | Labor | | 1 | \$ 200 | 25 | \$ 3,950 | | | | | | | | 5 | \$ 290 | 31 | \$4,440 | |
| | Reimbursables - AMEC Travel, purchase and application of Phoslock material (SePRO Corp) * | | | | | | | | | | | | | | | | \$171,063 | |
| | Subtotal | | | | | | | | | | | | | | | | \$175,503 | |
| Task 7. Analysis and reporting of permit compliance monitoring data | Labor | | 1 | \$ 200 | 17 | \$ 2,696 | | | | | | | | 8 | \$ 736 | 31 | \$3,912 | |
| | Subtotal | | | | | | | | | | | | | | | | \$3,912 | |
| Task 8. Project Report and Presentation | Labor | | 2 | \$ 400 | 53 | \$ 8,374 | | | | | | | | 9 | \$ 522 | 64 | \$9,296 | |
| | Reimbursables - AMEC Travel | | | | | | | | | | | | | | | | \$468 | |
| | Subtotal | | | | | | | | | | | | | | | | \$9,764 | |
| | Totals | | 18 | \$3,600 | 175 | \$27,650 | 16 | \$2,368 | 10 | \$1,640 | 45 | \$2,655 | 16 | \$1,472 | 47 | \$2,726 | 327 | \$221,984 |

Notes
 * based on a maximum (not-to-exceed) Phoslock™ dose rate and cost, as requested by County
 AMEC Total \$44,634
 AMEC Sub-contractors Total \$177,960
 Lump Sum \$46,491
 Not-To-Exceed \$175,503
 Total \$221,984



| Palm Beach County Pine Lake Phoslock Project Reimbursable Costs | Units | Unit Cost | Task 1. Kickoff meeting | | Task 2. Literature review | | Task 3a. Quantification of BAP mass | | Task 3b. Jar tests | | Task 3c. Final dose rate calculations | | Task 4. Permitting | | Task 5. Interim project review meeting | | Task 6. Phoslock application | | Task 7. Analysis & reporting of permit compliance data | | Task 8. Project report & presentation | | Total | | |
|---|----------------|------------|-------------------------|------------|---------------------------|------|-------------------------------------|----------|--------------------|----------|---------------------------------------|------|--------------------|------|--|------|------------------------------|------------|--|--------|---------------------------------------|------|------------|------|-------|
| | | | Units | Cost | Units | Cost | Units | Cost | Units | Cost | Units | Cost | Units | Cost | Units | Cost | Units | Cost | Units | Cost | Units | Cost | Units | Cost | Units |
| Subtotal - Analytical Lab | | | | | | | | | | | | | | | | | | | | | | | | | |
| Sediment - Phosphorus Speciation | each | \$50.00 | | | | | | | | | | | | | | | | | | | | | | | |
| Water - Ammonia (Total) | each | \$15.00 | 3 | \$ 45 | | | | | | | | | | | | | | | | | | | | | |
| Water - Chlorophyll | each | \$50.00 | 3 | \$ 150 | | | | | | | | | | | | | | | | | | | | | |
| Water - Chlorophyll | each | \$50.00 | 3 | \$ 150 | | | | | | | | | | | | | | | | | | | | | |
| Water - Nitrate-N | each | \$35.00 | 3 | \$ 105 | | | | | | | | | | | | | | | | | | | | | |
| Water - Nitrate-N | each | \$35.00 | 3 | \$ 105 | | | | | | | | | | | | | | | | | | | | | |
| Water - Nitrate-Nitrite-N | each | \$20.00 | 3 | \$ 60 | | | | | | | | | | | | | | | | | | | | | |
| Water - Nitrate-Nitrite-N | each | \$20.00 | 3 | \$ 60 | | | | | | | | | | | | | | | | | | | | | |
| Water - Nutrients Soluble Reactive Phosphorus | each | \$25.00 | 3 | \$ 75 | | | | | | | | | | | | | | | | | | | | | |
| Water - Nutrients Soluble Reactive Phosphorus | each | \$25.00 | 3 | \$ 75 | | | | | | | | | | | | | | | | | | | | | |
| Water - Nutrients Total Phosphorus | each | \$25.00 | 3 | \$ 75 | | | | | | | | | | | | | | | | | | | | | |
| Water - Nutrients Total Phosphorus | each | \$25.00 | 3 | \$ 75 | | | | | | | | | | | | | | | | | | | | | |
| Water - Orthophosphate (Total) | each | \$47.00 | 3 | \$ 141 | | | | | | | | | | | | | | | | | | | | | |
| Water - Orthophosphate (Total) | each | \$47.00 | 3 | \$ 141 | | | | | | | | | | | | | | | | | | | | | |
| Water - Ammonium (NH4-N) | each | \$17.50 | 6 | \$ 105 | | | | | | | | | | | | | | | | | | | | | |
| Water - Ammonium (NH4-N) | each | \$17.50 | 6 | \$ 105 | | | | | | | | | | | | | | | | | | | | | |
| Water - Ammonium (NH4-N) | each | \$17.50 | 6 | \$ 105 | | | | | | | | | | | | | | | | | | | | | |
| Subtotal - Analytical Lab | | \$426 | | | | | | | | | | | | | | | | | | | | | | | |
| Subtotal - Travel (AMEC) | | | | | | | | | | | | | | | | | | | | | | | | | |
| Meat | per osh | \$0.445 | 346 | \$ 154 | | | | | | | | | | | | | | | | | | | | | |
| Meat | per man-day | \$36.00 | 2 | \$ 72 | | | | | | | | | | | | | | | | | | | | | |
| Logging (e.g., Hilton Palm Beach Airport) | per man-day | \$170.99 | 2 | \$ 342 | | | | | | | | | | | | | | | | | | | | | |
| Subtotal - Travel | | | | \$ 468 | | | | | | | | | | | | | | | | | | | | | |
| Phoslock application | | | | | | | | | | | | | | | | | | | | | | | | | |
| Phoslock product | per metric ton | \$3,374.50 | 42 | \$ 141,729 | | | | | | | | | | | | | | | | | | | | | |
| Shipping | project | \$6,375.00 | 1 | \$ 6,375 | | | | | | | | | | | | | | | | | | | | | |
| On-site storage and handling | project | \$1,100.00 | 1 | \$ 1,100 | | | | | | | | | | | | | | | | | | | | | |
| Application equipment | per hour | \$50.00 | 225 | \$ 11,250 | | | | | | | | | | | | | | | | | | | | | |
| Application equipment | per hour | \$50.00 | 225 | \$ 11,250 | | | | | | | | | | | | | | | | | | | | | |
| Application travel - lodging | per man-day | \$120.99 | 135 | \$ 16,333 | | | | | | | | | | | | | | | | | | | | | |
| Application travel - meals | per man-day | \$36.00 | 20 | \$ 720 | | | | | | | | | | | | | | | | | | | | | |
| Application travel - meals | per man-day | \$36.00 | 20 | \$ 720 | | | | | | | | | | | | | | | | | | | | | |
| Application travel - mileage | per mile | \$0.445 | 900 | \$ 401 | | | | | | | | | | | | | | | | | | | | | |
| Application travel - mileage | per mile | \$0.445 | 900 | \$ 401 | | | | | | | | | | | | | | | | | | | | | |
| Subtotal - Phoslock application* | | | | \$ 170,324 | | | | | | | | | | | | | | | | | | | | | |
| Total | | | | \$ 468 | | | | \$ 1,920 | | \$ 6,268 | | | | | \$ 468 | | | \$ 171,083 | | \$ 468 | | | \$ 179,703 | | |



SePRO Corporation • 11550 North Meridian Street • Suite 600 • Carmel, Indiana 46032-4565
Phone: (317) 580-8282 Fax: (317) 428-4577

February 17, 2012

Palm Beach County - Environmental Resources Management (ERM)
Environmental Enhancement & Restoration Division
Engineering Services Section
Attention: Juan Cueto

Subject: Pine Lake Phosphorus Mitigation Project

Mr. Cueto,

We appreciate the opportunity to be considered as part of the team that will assess, design and implement a phosphorus mitigation solution using Phoslock phosphorus locking technology in Pine Lake. SePRO Corporation is the business, logistics and technical development representative of Phoslock in the United States. We will be collaborating with AMEC on project assessment, Phoslock prescription development and implementation phases of this project. SePRO will be responsible for delivery and local logistics associated with the required quantity of Phoslock selected for application in Pine Lake. SePRO will also collaborate with the selected professional applicator, Clear Waters, Inc., for the Phoslock application phase of the project. As the SePRO Water Quality and Technology Leader for SePRO, I will be leading management of the SePRO tasks highlighted below.

Phoslock Technology & Stewardship Services for Pine Lake, Palm Beach County, Florida

| Product | Quantity/MT | Rate/MT | subtotal |
|--|-------------|-------------|----------------------|
| Phoslock Technology (metric tons=MT) | 42 | \$ 3,374.50 | \$ 141,729.00 |
| Phoslock freight (to lake site) | 42 | project | \$ 5,375.00 |
| On-site Storage and Logistics (up to 7 days) | 42 | project | \$ 3,100.00 |
| TOTAL | | | \$ 150,204.00 |

Sincerely,

Shaun Hyde

cc Gerold Morrison, PhD, AMEC

Phoslock Technology & Stewardship Services for Pine Lake, Palm Beach County, Florida

| SePRO Corporation | | | | | | | | |
|---|-------------|-------------|-------|----------------|-------|--------------------------------|-------------|----------------------|
| Product | Quantity/MT | Rate/MT | Units | Truckload Rate | Units | LTl Rate (Less Than Truckload) | Unit Rate | subtotal |
| Phoslock Product (metric tons=MT) | 42 | \$ 3,374.50 | | | | | | \$ 141,729.00 |
| Phoslock freight (via truck, estimated 782 miles from warehouse in Rocky Mount, NC to Lake, rate subject to freight and fuel surcharges at actual time of shipment) | 42 | .. | 2 | \$ 2,150.00 | 1 | \$ 1,075.00 | | \$ 5,375.00 |
| On-site Storage - 3 POD containers (up to 7 days) | 42 | .. | | | 3 | | \$ 600.00 | \$ 1,800.00 |
| On-site Logistics -Boom Forklift (up to 7 days) | | | | | 1 | | \$ 1,300.00 | \$ 1,300.00 |
| TOTAL | | | | | | | | \$ 150,204.00 |

| Clear Waters, Inc. | | | | | | |
|---|-----------------|-------------------------------|-------------------|---------------|----------|---------------------|
| Services | Labor Hours/day | # of professional technicians | # of days on site | Total # hours | Rate/hr | Subtotal |
| Professional Aquatic Application Services | 9 | 5 | 5 | 225 | \$ 60.00 | \$ 13,500.00 |
| Equipment | Hours/day | Units | days on site | Total # hours | Rate/hr | Subtotal |
| Boats & Application Equipment Charges | 9 | 3 | 5 | 135 | \$ 20.00 | \$ 2,700.00 |
| Travel | Daily | # of staff | # of days | # vehicles | miles | |
| Lodging | \$ 121 | 5 | 4 | | | \$ 2,420.00 |
| Meals | \$ 36 | 5 | 5 | | | \$ 900.00 |
| Mileage (round trip) | | | | 3 | 300 | \$ 400.50 |
| TOTAL | | | | | | \$ 19,920.50 |

Clear Waters, Inc.

P.O. Box 291522
 Port Orange, FL 32129
 Ph: (386) 767-4928
 Fax: (386) 767-4713
 Email:
clearwatersinc@bellsouth.net

February 9th, 2012

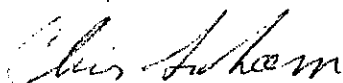
Pine Lake Phoslock Project

Clear Waters, Inc. appreciates the opportunity to partner with the team preparing to implement a phosphorus mitigation project in Pine Lake. Clear Waters, Inc has been selected as the Professional Applicator company to work with SePRO Corporation to conduct the application of Phoslock for this project, pending final approvals. We have provided SePRO Corporation a budget for our applications services as they have been identified to us to date. Here is a pricing summary;

| Clear Waters, Inc. | | | | | | |
|---|-----------------|-------------------------------|-------------------|---------------|----------|---------------------|
| Services | Labor Hours/day | # of professional technicians | # of days on site | Total # hours | Rate/hr | Subtotal |
| Professional Aquatic Application Services | 9 | 5 | 5 | 225 | \$ 60.00 | \$ 13,500.00 |
| Equipment | Hours/day | Units | # of days on site | Total # hours | Rate/hr | Subtotal |
| Boats & Application Equipment Charges | 9 | 3 | 5 | 135 | \$ 20.00 | \$ 2,700.00 |
| Travel | Daily | # of staff | # of days | # vehicles | miles | |
| Lodging | \$ 121 | 5 | 4 | | | \$ 2,420.00 |
| Meals | \$ 36 | 5 | 5 | | | \$ 900.00 |
| Mileage (round trip) | | | | 3 | 300 | \$ 400.50 |
| TOTAL | | | | | | \$ 19,920.50 |

If you have any questions or concerns please contact us at the number or email address listed above.

Sincerely,



Chris Graham
 Administrator

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Tampa
6712 Benjamin Road
Suite 100
Tampa, FL 33634

Tel: (813) 885-7427
Fax: (813) 885-7049
www.testamericainc.com

February 16, 2012

Dr. Gerold Morrison
AMEC-BCI Engineers & Scientists, Inc
PO BOX 5467
2000 E. Edgewood Dr., Suite 215
Lakeland, FL 33803
gmorrison@bcieng.com
Tel: (863) 640-2385

Subject: Request for Proposal
Palm Beach County Phoslock
Quote Number: 66005615

Dear Dr. Gerold Morrison,

On behalf of TestAmerica Laboratories, Inc., and its affiliates, I am pleased to submit pricing for the Palm Beach County Phoslock project. TestAmerica is eager to support this commitment by making our personnel and analytical laboratory resources available to you. As the largest environmental laboratory company in the world TestAmerica offers a full range of analytical services in one company.

Lanthanum analysis will be conducted by Activation Laboratories located in Ontario, CN. They are the only lab certified in FL for Lanthanum analysis. NELAC certification number E87979. Analysis will be done by ICP-MS (method reference is an internal SOP-AL QOP-Hydrogeo/ICP-MS). Turn around time (TAT) for this test is 14 calendar days.

We thank you for choosing TestAmerica Laboratories, and we look forward to working with you for this project. Your Tampa project manager is Nancy Robertson. The following quotation contains a detailed price breakdown, as well as any notes and clarifications pertaining to your project. This quotation is subject to TestAmerica's Standard Terms and Conditions, unless otherwise agreed upon in writing. Should you have any further questions or require additional information about our analytical services, please feel free to contact me at 813-885-7427 or via email at the address listed below.

Sincerely,



Todd Baumgartner
Laboratory Director
todd.baumgartner@testamericainc.com

TestAmerica Tampa
 6712 Benjamin Road
 Suite 100
 Tampa, FL 33634

Prepared for:
 Dr. Gerold Morrison
 AMEC-BCI Engineers & Scientists, Inc
 PO BOX 5467
 2000 E. Edgewood Dr., Suite 215
 Lakeland, FL 33803
 gmorrison@bcieng.com
 Tel: (863) 640-2385

Prepared by Robertson, Nancy
 Date 2/16/2012
 Expiration Date 5/15/2012
 Est. Start Date

Project: Palm Beach County Phoslock **Quote Number: 66005615 - 1**

Lake Group TAT: 7_Days (Business Days)

| Matrix | Method | Test Description | Quantity | Unit Price | Extended Price |
|--------|--------------|--|----------|------------|----------------|
| Water | 365.4 | Phosphorus, Total | 3 | \$ 22.00 | \$ 66.00 |
| Water | SM 4500 P E | Orthophosphate | 3 | \$ 25.00 | \$ 75.00 |
| Water | 351.2 | Nitrogen, Total Kjeldahl | 3 | \$ 35.00 | \$ 105.00 |
| Water | 350.1 | Nitrogen, Ammonia needed for NH4 | 3 | \$ 20.00 | \$ 60.00 |
| Water | UnionizedNH3 | Ammonium, NH4 calculation | 3 | \$ 0.00 | \$ 0.00 |
| Water | 353.2 | Nitrogen, Nitrate-Nitrite | 3 | \$ 25.00 | \$ 75.00 |
| Water | SM 2130B | Turbidity | 3 | \$ 12.00 | \$ 36.00 |
| Water | SM 2320B | Alkalinity | 3 | \$ 15.00 | \$ 45.00 |
| Water | Subcontract | Total and Dissolved Lanthanum- Subcontract to Activation Laboratories, ICPMS | 6 | \$ 47.00 | \$ 282.00 |

Lake Group TAT: 7_Days (Business Days) (to be analyzed by Orlando)

| Matrix | Method | Test Description | Quantity | Unit Price | Extended Price |
|-------------------------|-----------|--|----------|------------|------------------|
| Water | SM 10200H | Chlorophyll-a (corrected for pheophytin) | 3 | \$ 50.00 | \$ 150.00 |
| Total Lake Group | | | | | \$ 894.00 |

Jar Test Group TAT: 7_Days (Business Days)

| Matrix | Method | Test Description | Quantity | Unit Price | Extended Price |
|-----------------------------|-------------|--|----------|------------|--------------------|
| Water | 365.4 | Phosphorus, Total | 32 | \$ 22.00 | \$ 704.00 |
| Water | SM 4500 P E | Orthophosphate | 32 | \$ 25.00 | \$ 800.00 |
| Water | SM 2320B | Alkalinity | 32 | \$ 15.00 | \$ 480.00 |
| Water | Subcontract | Total and Dissolved Lanthanum- Subcontract to Activation Laboratories, ICPMS | 64 | \$ 47.00 | \$ 3,008.00 |
| Total Jar Test Group | | | | | \$ 4,992.00 |

Quote Other Charges

| Description | Quantity | Unit Price | Extended Price |
|---------------------------------|----------|------------|----------------|
| Lab Management Subcontract Fee | 1 | \$ 200.00 | \$ 200.00 |
| Services - subcontract shipping | 1 | \$ 100.00 | \$ 100.00 |

TestAmerica Tampa
6712 Benjamin Road
Suite 100
Tampa, FL 33634

Prepared for:

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gmorrison@bcieng.com
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Prepared by Robertson, Nancy
Date 2/16/2012
Expiration Date 5/15/2012
Est. Start Date

Project: Palm Beach County Phoslock

Quote Number: 66005615 - 1

| | |
|---------------------------------------|--------------------|
| Total Other Charge | \$300.00 |
| Total Other Charges | \$ 300.00 |
| Total Analysis Charges | \$ 5,886.00 |
| Grand Total for Quote 66005615 | \$ 6,186.00 |

**Quoted charges do not include sales tax. Applicable sales tax will be added to invoices where required by law.

TestAmerica Tampa
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Tampa, FL 33634

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Date 2/16/2012
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Est. Start Date

Project: Palm Beach County Phoslock

Quote Number: 66005615 - 1

PROJECT DETAILS

TestAmerica Tampa
 6712 Benjamin Road
 Suite 100
 Tampa, FL 33634

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Prepared by Robertson, Nancy
 Date 2/16/2012
 Expiration Date 5/15/2012
 Est. Start Date

Project: Palm Beach County Phoslock

Quote Number: 66005615 - 1

Lake Group

| Matrix | Method | Test Description | Analyte | RL | MDL | Units |
|--------|--------------|----------------------------------|--|-------------------|-------------------|----------------------|
| Water | 365.4 | Phosphorus, Total | Phosphorus, Total | 0.3 | 0.1 | mg/L |
| Water | UnionizedNH3 | Ammonium, NH4 calculation | Ammonium ion as NH4 | 0.0005 | 0.0005 | mg/L |
| Water | SM 4500 P E | Orthophosphate | Orthophosphate | 0.3 | 0.075 | mg/L |
| Water | SM 2130B | Turbidity | Turbidity | 0.1 | 0.1 | NTU |
| Water | SM 2320B | Alkalinity | Alkalinity | 1 | 1 | mg/L |
| Water | 353.2 | Nitrogen, Nitrate-Nitrite | Nitrate Nitrite as N Nitrite as N Nitrate as N | 0.5 0.5 0.5 | 0.1 0.1 0.1 | mg/L mg/L mg/L |
| Water | 351.2 | Nitrogen, Total Kjeldahl | Nitrogen, Kjeldahl | 0.2 | 0.05 | mg/L |
| Water | 350.1 | Nitrogen, Ammonia needed for NH4 | Ammonia as N | 0.02 | 0.01 | mg/L |

Jar Test Group

| Matrix | Method | Test Description | Analyte | RL | MDL | Units |
|--------|-------------|------------------|----------------|-----|-------|-------|
| Water | SM 4500 P E | Orthophosphate | Orthophosphate | 0.3 | 0.075 | mg/L |

TestAmerica Tampa
 6712 Benjamin Road
 Suite 100
 Tampa, FL 33634

Prepared for:

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 AMEC-BCI Engineers & Scientists, Inc
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 Tel: (863) 640-2385

Prepared by Robertson, Nancy
 Date 2/16/2012
 Expiration Date 5/15/2012
 Est. Start Date

Project: Palm Beach County Phoslock

Quote Number: 66005615 - 1

Jar Test Group

| Matrix | Method | Test Description | Analyte | RL | MDL | Units |
|--------|----------|-------------------|-------------------|-----|-----|-------|
| Water | 365.4 | Phosphorus, Total | Phosphorus, Total | 0.3 | 0.1 | mg/L |
| Water | SM 2320B | Alkalinity | Alkalinity | 1 | 1 | mg/L |



February 17, 2012

Todd Baumgartner
Test America
2846 Industrial Plaza Drive
Tallahassee, FL 32301
Tel 850 878 3994
Todd.baumgartner@testamericainc.com

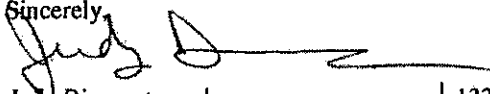
Dear Mr. Baumgartner,

We are pleased to quote you a price of US\$47.00/sample for Lanthanum by ICPMS (Code 6).

I have attached our general information page that has our shipping address as well as our sample submittal forms.

Please let me know if you have any questions.

Sincerely,


Judy Diamantopoulos
Turnaround Time Manager
Activation Laboratories Ltd.

1336 Sandhill Drive
Ancaster, Ontario
L9G 4V5 Canada

T: 905.648.9611 x101
TF: +1.888.228.5227
F: 905.648.9613
judy@actlabs.com
www.actlabs.com



ISO/IEC 17025 (Lab 266). NELAP (E:87979). Health Canada Licensed, FDA inspected and registered

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February 16, 2012

Gerold Morrison
AMEC

Re: Price Quote for Sediment Samples

Dear Dr. Morrison:

As requested I am submitting a price quote for sediment samples for the following parameters.

| Parameter | Analysis Method | # of Samples | Unit Cost | Extended Cost |
|-----------------------------------|------------------------------|--------------|-----------|-------------------|
| %Dry Weight (processing) | ASA 21-2 | 3 | \$9.00 | \$27.00 |
| Grinding (processing) | n/a | 3 | \$15.00 | \$45.00 |
| Soloid bound and Exchangable Ca * | DBE SOP OPO4 | 3 | \$32.50 | \$97.50 |
| Aluminum Phosphate * | DBE SOP OPO4 | 3 | \$43.25 | \$129.75 |
| Iron Phosphate * | DBE SOP OPO4 | 3 | \$49.50 | \$148.50 |
| Reductant Soluble Phosphate * | DBE SOP OPO4 | 3 | \$132.00 | \$396.00 |
| Calcium Phosphate * | DBE SOP OPO4 | 3 | \$49.50 | \$148.50 |
| Total Phosphorus | EPA 365.2 (Digest COE 3-227) | 3 | \$19.25 | \$57.75 |
| | | | | \$1,050.00 |

* Modified Chang & Jackson

This price quote is valid for 6 months from the letter date.

If you have any questions or concerns, please contact me at (321) 639-4896.

Sincerely,

Nancy Chan
Laboratory Manager

Applied Technology & Management
Continuing Contract for Coastal and Marine Engineering

Contract R2010-1296 dated August 17, 2010 for period of two years expires on August 16, 2012.
 Contract Amendment No. 1 (R2011-0059) dated 1-11-11 changes IG Lanuage and Period of Service clause.
 SBE-M/WBE Goal 15.0% (10% SBE/White; 5% MBE/Woman)

Task order summary:

| TASK NUMBER | TOTAL/ SBE and/or MWBE AMOUNT | TASK DUE DATE | TASK DESCRIPTION | APPROVED BY/DATE |
|-----------------------|--|------------------|--|---------------------|
| ATM-01 | 76,661.81 73,660.00 | 11/1/2010 | 2010 Regional Monitoring Beach Profiles, Ebb Shoal Surveys and SLWI Sand Trap Survey | CRC 8/18/2010 |
| AMENDMENT NUMBER 1 | | | Inspector General language and Period of Service clause changes | BCC 1/11/2011 |
| 1296-02 | 19,690.62 0.00 | 5/15/2011 | Juno Beach - 12 Month Post-Construction Physical Monitoring Report | ERM 2/16/2011 |
| ATM-01A | 2,696.32 2,550.00 | 5/10/2011 | 2010 Regional Monitoring - SLWI Sand Trap Survey 2 | ERM 5/5/2011 |
| 1296-03 | 60,112.59 58,640.00 | 10/1/2011 | 2011 Regional Monitoring - Beach Profiles and Ebb Shoal Surveys | CRC 6/29/2011 |
| 1296-04 | 5,863.61 5,490.00 | 9/19/2011 | SLWI Sand Trap Expansion & Maintenance Dredging - Bathymetric Surveys | ERM 8/23/2011 |
| 1296-05 | 25,067.04 0.00 | 11/20/2011 | SLWI Sand Trap Expansion & Maintenance Dredging - Seagrass Survey | ERM 9/6/2011 |
| 1296-03A | 9,662.49 8,600.00 | 12/31/2011 | 2011 Regional Monitoring - Beach Profiles and Ebb Shoal Surveys | ERM 10/30/2011 |
| 1296-06 | 234,738.74 28,229.80 | 7/16/2013 | SLWI Sand Trap Expansion & Maintenance Dredging - Design & Permitting | BCC 1/24/2012 |
| 1296-07 | 233,094.00 0.00 | 12/31/2012 | Phoslock Project | BCC |
| | | | | |
| | | | | |
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| | | | | |
| | | | | |

Total: 667,587.22
 SBE-MBE: 177,169.80
 SBE-MBE Participation: 26.5%
 Report Date & Filename: 03/13/12

JC

R2010 1296

**CONTRACT FOR PROFESSIONAL CONSULTANT SERVICES
BETWEEN PALM BEACH COUNTY AND
APPLIED TECHNOLOGY & MANAGEMENT, INC.**

This Contract is made as of AUG 17 2010, by and between Palm Beach County, a Political Subdivision of the State of Florida, by and through its Board of County Commissioners, hereinafter referred to as the COUNTY, and Applied Technology & Management, Inc., 400 S. Australian Avenue, Suite 300, West Palm Beach, FL 33401, an engineering firm, a corporation, authorized to do business in the State of Florida, hereinafter referred to as the CONSULTANT, whose Federal I.D. Number is 59-2413268

In consideration of the mutual promises contained herein, the COUNTY and the CONSULTANT agree as follows:

ARTICLE 1 - SERVICES

The CONSULTANT's responsibility under this Contract is to provide professional coastal and marine engineering services and incidental services as more specifically set forth in the Scope of Work attached hereto as Exhibit "A". In the event services are required to be performed that are not described in Exhibit "A", but are within the general scope of services, the COUNTY and the CONSULTANT hereby reserve the right to negotiate task orders covering the desired services.

The CONSULTANT shall conduct professional services in accordance with Chapters 471 and 472, Florida Statutes and other applicable local, state and federal standards. The CONSULTANT shall conduct topographic and hydrographic survey work in compliance with the most current U.S. Army Corps of Engineers "Technical Requirements for Surveying, Mapping and Photogrammetric Services", the most current U.S. Army Corps of Engineers "Engineering Design: Hydrographic Surveying," EM 1110-2-1003, and the most current Florida Department of Environmental Protection specifications for topographic (section 02000) and bathymetric (section 02100) surveying.

ARTICLE 2 - PERIODS OF SERVICE AND SCHEDULES

This Contract commences on the day and year first written above and ends two years later. At the option of the COUNTY, the Contract can be renewed for an additional one-year period.

Reports and other work items shall be delivered or completed according to schedules established in each task order.

ARTICLE 3 - ASSIGNMENT OF WORK

The CONSULTANT shall provide professional services on a task order basis. A copy of the Task Order form and Task Change Order form are attached hereto as Exhibit "C" and Exhibit "D". The COUNTY reserves the right to modify these forms during the term of the Contract. The

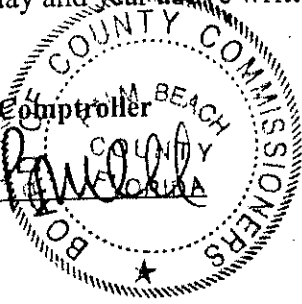
IN WITNESS WHEREOF, the Board of County Commissioners of Palm Beach County, Florida has made and executed this Contract on behalf of the COUNTY and CONSULTANT has hereunto set its hand the day and year above written

R 2010 12 96 AUG 17 2010

ATTEST:

Sharon R. Bock, Clerk & Comptroller

By: [Signature]
Deputy Clerk



PALM BEACH COUNTY
BOARD OF COUNTY COMMISSIONERS:

By: [Signature]
to Burt Aaronson, Chair
Steven L. Abrams

CONSULTANT:

WITNESS:

[Signature]
Signature

Judy Oyler
Name (type or print)

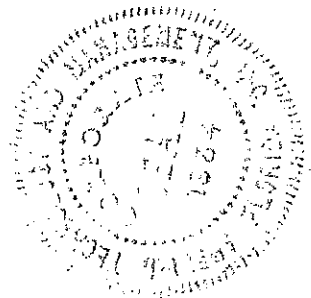
Applied Technology & Management, Inc.
Company Name

[Signature]
Signature

Michael Jenkins, Ph.D., P.E.
Typed Name

Coastal Engineering Team Leader
Title

(corporate seal)



APPROVED AS TO FORM
AND LEGAL SUFFICIENCY

By: [Signature]
Assistant County Attorney

APPROVED AS TO TERMS
AND CONDITIONS

By: [Signature]
Richard E. Walesky, Director
Dept. of Environmental Resources Mgmt.

EXHIBIT B
APPLIED TECHNOLOGY AND MANAGEMENT, INC.
2010 WAGE AND EQUIPMENT RATES
rev. 7/26/10

WAGE RATES

| EMPLOYEE CLASS | HOURLY WAGE RATE (AVG) | BILLABLE RATES |
|-------------------------------------|-------------------------------|-----------------------|
| Coastal Team Leader | \$54.59 | \$155.58 |
| Coastal Engineer | \$43.24 | \$123.23 |
| Senior Scientist | \$70.00 | \$133.00 |
| Senior Scientist (SCUBA rate) | \$120.00 | \$160.50 |
| Junior Engineer / Engineering Tech. | \$26.82 | \$76.44 |
| Professional Surveyor & Mapper | \$65.00 | \$105.30 |
| Construction Manager | \$45.00 | \$85.50 |
| Sr. CAD/GIS | \$25.16 | \$71.71 |
| Jr. CAD | \$16.15 | \$46.02 |
| Sr. Admin./Tech. Editor | \$25.67 | \$73.16 |
| Administrative/Clerical | \$15.38 | \$43.84 |

EQUIPMENT RATES

| EQUIPMENT TYPE | RATE | RATE UNIT |
|---------------------------------------|-------------|------------------|
| ATM Survey Vessel w/DGPS ¹ | \$850 | DAY |
| RTK GPS | \$450 | DAY |
| Trimble Pro-XR | \$125 | DAY |
| Survey Vehicle | \$100 | DAY |
| Tide Gauge | \$75 | DAY |
| Turbidity Meter | \$50 | DAY |
| Underwater Still Camera w/Strobe | \$75 | DAY |
| SCUBA Gear | \$25 | DAY |
| Photocopies (8.5 x 11) | \$0.12 | COPY |
| Color Copies | \$0.75 | COPY |
| Standard Paper Plots (24 x 36) | \$1.00 | COPY |
| Heavy Duty Plots | \$7.50 | COPY |

1. Survey Vessel Rate includes Hypack and Fathometer Systems
2. Billable Rate based on a 2.85 Multiplier applied to the Hourly Wage Rate for non-hourly staff.

The Chair thereupon declared the Resolution duly passed and adopted this _____ day
of _____, 2012.

APPROVED AS TO FORM AND
LEGAL SUFFICIENCY

By  _____
Assistant County Attorney

**PALM BEACH COUNTY, FLORIDA BY ITS
BOARD OF COUNTY COMMISSIONERS**

_____, Clerk

By _____
Deputy Clerk

2012 - 0722

BGEX -380-0314120000000001166

BOARD OF COUNTY COMMISSIONERS
PALM BEACH COUNTY, FLORIDA

BUDGET TRANSFER
Fund 1223 Environmental Enhance-Freshwtr

| ACCOUNT NAME AND NUMBER | ORIGINAL BUDGET | CURRENT BUDGET | INCREASE | DECREASE | ADJUSTED BUDGET | ENC/EXP 3/14/2012 | REMAINING BALANCE |
|-----------------------------|---------------------------------|----------------|----------|----------|-----------------|-------------------|-------------------|
| <u>Appropriations</u> | | | | | | | |
| 380-3892 Reserve-Freshwater | 9902 - Operating Reserves | 509,653 | 509,653 | 0 | 151,547 | 358,106 | 0 |
| 380-3091 Phoslock | 3401-Other Contractual Services | 0 | 0 | 151,547 | 0 | 151,547 | 0 |
| | | | 0 | | | | |
| | | | 151,547 | 151,547 | | | |

Signatures & Dates

BY BOARD OF COUNTY COMMISSIONERS

AT MEETING OF

April 3, 2012

Deputy Clerk to the

Board of County Commissioners

Environmental Resources Management

INITIATING DEPARTMENT/DIVISION

Administration/Budget Department Approval

OFMB Department - Posted

[Signature]
[Signature] 3/20/12
JB 3/19