Proposal for Environmental Projects Benefiting San Diego Bay

Marina Trash Skimmer Installation and Monitoring

Prepared for:

San Diego Unified Port District

Submitted by:

AMEC Earth & Environmental, Inc.

4 May 2009

Unified Port of San Diego

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4 May 2009

AMEC Proposal No.: 09PROP0010-0033

Eileen Maher
Environmental Services Department
Port of San Diego
3165 Pacific Highway
San Diego, CA 92101

Subject: **Request for Proposals, Environmental Projects Benefiting San Diego Bay**
Proposal for Marina Trash Skimmer Installation and Monitoring

Dear Ms. Maher:

AMEC Earth & Environmental, Inc. (AMEC) is pleased to submit this proposal to the Port of San Diego (Port) in response to the Port's request for environmental programs that are "beyond compliance and mitigation." We have assembled a team of highly qualified professionals having the expertise necessary to install four trash skimmers and monitor their effectiveness in improving San Diego Bay water quality. AMEC's San Diego-based Aquatic Sciences group is well qualified to assist the Port with the successful completion of all job task orders. AMEC's team will be lead by Ms. Michelle Woo. Ms. Woo is also the project manager for the Port environmental project that is installing used oil recycling centers at several marinas. AMEC's industry partner for the project will be Mr. Gregory W. Boeh of Pier 32 Marina. The marina selected to participate in this project will be providing the matching funds necessary to support this project. The AMEC/Pier 32 team offers:

- A project manager with experience in water quality and marina/recreational boating issues as well as several years of working throughout San Diego Bay.
- A team with extensive experience working directly with the Port of San Diego in numerous fields (i.e., water quality, sediment investigations, marina surveys).
- A highly qualified and respected marina manager, Mr. Greg Boeh, will serve as AMEC's industry expert.

Project Title: Marina Trash Skimmer Installation and Monitoring	
Project Description	Procurement and installation of marina trash skimmer at four marinas and the conduct of a one year study to measure their effectiveness
Project Manager	Michelle Woo Tel: (858) 300-4324 michelle.woo@amec.com
Grant Funding Request	$74,380
Total Cost of Proposal	$99,180
Project Timeline	August 2009 – November 2010
Benefit to San Diego Bay	Reduction in trash and debris in four marinas and San Diego Bay. Water quality and aesthetic improvements
Source Matching Fund	Mr. Gregory W. Boeh Pier 32 Marina and others

Thank you for providing AMEC the opportunity to provide the Port with our ideas to improve the water quality in San Diego Bay. Should you require additional information, please call me at (858) 300-4324 or via e-mail: michelle.woo@amec.com.

Best Regards,

AMEC Earth & Environmental, Inc.

Michelle N. Woo
Project Manager, Marine Scientist

Attachments: Proposal (3 hard copies, 1 CD-ROM)

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1. Introduction

In response to the Port of San Diego (Port) Environmental Committee (EC) request for environmental projects benefiting San Diego Bay (Bay), AMEC Earth & Environmental, Inc. (AMEC) is pleased to submit this proposal to install a marina trash skimmer (MTS) at four San Diego Bay marinas, monitor their effectiveness in removing trash and debris from the Bay, and measure their success in improving water quality. The following proposal describes a "beyond compliance and mitigation" project that will benefit San Diego Bay water quality, natural resources, wildlife, and endangered species. As described below, this project will also have an optional educational/promotional component.

Due to the general construction of marinas and prevailing winds, there is usually an area within each marina where floating trash and debris collects naturally. These areas also tend to have low flushing and often accumulate other floating organic material that may further degrade water quality. Marina employees often spend many hours a week with the laborious task of scooping trash out of the water with a swimming pool net or similar device. Installation of trash skimming devices is one way in which to intercept trash and debris before making its way into Bay waters. Currently there is no MTS permanently installed within any San Diego Bay marina; however, there is a MTS operating at Pier 32 Marina in National City on a temporary 90-day trial basis. The results of this pilot study have shown great promise; consequently, AMEC is proposing to assist Pier 32 and three other San Diego Bay marinas in an effort to expand this trial study to other locations on a more permanent basis. AMEC's industry partner for this contract will be Mr. Gregory W. Boeh, dockmaster at Pier 32 Marina.

The proposed MTS would not only work quietly 24 hours a day to contain unsightly floating debris, plastic and organic, but would also aid in improving the water quality throughout the marina. There is also an area within the device for a bilge absorbent pad to be installed to absorb oil sheen waste for proper disposal further improving marina water quality. Once installed, the only maintenance needed is the removal of the flotsam and jetsam that has accumulated in the device and perhaps installing a new bilge pad. The frequency of the removal will depend on the rate of accumulation. The proposed trash skimmers will be beneficial to San Diego Bay for several reasons: they will improve water quality within the marinas; they will provide an aesthetic benefit by reducing or eliminating unsightly floating debris and scum, and, most importantly, they will remove plastics and other debris from surface waters that might otherwise enter the Bay and interfere with wildlife and navigation.

In addition to the general need for trash skimmers, AMEC has also learned that the proposed recipient marinas participate in the Clean Marina California Program. This organization, composed of marina managers and owners, yacht club managers and owners, and boaters, was established to develop and implement marina and boating best management practices (BMPs) to ensure that their members are good environmental stewards. The addition of a MTS at each marina would only further their efforts as well as San Diego's reputation as the leader in the development and implementation of innovative water quality-related BMPs.

To address the issues outlined above, AMEC is requesting Port EC funds to install a MTS at four San Diego Bay marinas. The proposed installation locations are Pier 32 in National City, The Wharf in America's Cup Harbor, Harbor Island West Marina, and Half Moon Bay Marina on Shelter Island. Pier 32 Marina, located in the south bay was also the recipient of Port environment project funding (managed by Michelle Woo of AMEC) that was used to install a state of the art used oil recycling center. The second of the four sites, The Wharf, is located on the northern end of the Bay in a newly revitalized section of America's Cup Harbor. The individual marinas will be responsible for providing matching funds for the installation, operation, and maintenance of the proposed systems. The following proposal outlines AMEC's proposed approach to studying the improvements on water quality by installing the MTSs, our schedule and deliverables, the project team, and AMEC's cost proposal.

2. Project Narrative

AMEC understands that the Port EC is seeking projects that protect and improve the environmental conditions of San Diego Bay and are "beyond compliance and mitigation." We interpret this to mean projects that will improve/enhance the bay environment, but would normally "fall through the cracks" due to the absence of state or federal regulatory mandates and/or the lack of a funding vehicle. The study that AMEC is proposing falls into this category. Without question, the round-the-clock collection and

sequestration of floating marine debris will keep these waste products from degrading the San Diego Bay environment and sustaining its wildlife community. At the present time, however, there is no legislative driver to mandate the placement of trash collection equipment at marinas, only the encouragement to do so as a clean marina BMP.

AMEC's goal is to rectify this situation by working with the Port and selected marinas to install MTS and conduct a well-planned and thorough evaluation of their effectiveness based upon our experience with water quality monitoring and Greg Boeh's extensive knowledge of marina operations.

Proposed Project Description, Implementation, and Impact Measurement

AMEC proposes to install four trash skimming devices at four separate marinas in San Diego Bay. Prior to installation AMEC will conduct several routine water quality tests for water clarity and dissolved oxygen, two important drivers for a healthy ecosystem. We will also conduct an overview of the existing marine and vegetative live around the marina and general observations of the water quality. Post-installation; similar water quality tests and ecology overview will be conducted for comparison. AMEC will also work with the marinas and monitor and amounts of flotsam and jetsam that are removed from the units. AMEC's study will include the following five tasks (each project task is discussed in detail below):

Task 1 – Preparation of a detailed work plan and establishment of success criteria
Task 2 – Equipment acquisition and installation/operation and maintenance
Task 3 – Field measurements
Task 4 – Preparation of project deliverables
Task 5 – Educational/promotional outreach (optional)

Task 1 - Preparation of a Detailed Work Plan and Establishment of Success Criteria

Prior to ordering any equipment, AMEC will prepare a detailed work plan to serve as the blueprint for conducting the entire project. The draft and final work plans will be presented to the Port for review and approval prior to beginning work. The work plan will provide a summary of the equipment procurement and installation procedures, equipment purchase and shipping costs, installation methods, and operation and maintenance procedures. This plan would be used to train marina personnel in the correct conduct of all aspects of the proposed project.

An important component of the work plan will to establish the metric that will be used to measure the effective of the MTS devices and how this translates into water quality improvements. These metrics will be established through consultation with the Port.

The detailed work plan would contain a list of deliverables, project schedule, and health and safety related information.

Task 2 - Equipment Acquisition and Installation/Operation and Maintenance

AMEC will be responsible for the purchase of the MTS devices and arrangement for delivery of the units to each marina. The MTS units are manufactured by Marina Accessories, Inc., of Bellingham, Washington. Operating on common 20 Amp 125 Volt power the MTS employs a patented technology of water displacement and works round the clock to collect and retain all floating trash in its vicinity. With a relatively small footprint, (6' wide x 4' deep x 18" freeboard), the MTS fits easily into any area of a marina or waterway. Its whisper quiet operation will not disturb the neighbors.

The individual marinas will provide a crane barge and staff for this task as part of their matching funds.

Task 3 - Field Measurements

This task will involve measuring, on a quantitative basis, the effectiveness of the MTS systems. Working with the Port and marina operators, a set of measurable metrics will be established prior to installation of the device. These metrics will be summarized in the detailed work plan. Preliminarily, AMEC envisions that these metric could include:

- Estimating the volume of trash and debris recovered by the MTS by setting aside a dedicated trash receptacle and maintaining a log of the amount of material (volume and/or weight) recovered in a given amount of time. This information will be summarized in the quarterly and annual reports in tabular form.

- Conducting periodic evaluations of the types of materials (e.g., plastics, wood, scum, Styrofoam) collected by the MTS. This information will help to determine if there is a seasonal component to the types of trash and debris encountered in marinas, or if the four separate marinas have similar or different types of recoverable wastes. This information will be particularly valuable during the establishment of a source control program.
- Maintaining reports of operation and maintenance issues encountered.
- Field measurements of water clarity and dissolved oxygen near and away from the MTS could be taken. This information might show that the device might trap materials that cause increase turbidity within marina waters.

Marina personnel will be primarily responsible for the collection of MTS field data. AMEC will put together a standard operating procedure (SOP) containing standardized data logs for conducting the on-going monitoring program and train marina personnel in monitoring methods and data recording. AMEC will also be responsible for gathering logs from each marina and compiling/analyzing gathered data.

Task 4 - Preparation of Project Deliverables

This task involves the preparation of all project deliverables. AMEC will be responsible for the preparation of draft and final deliverables in a format that is satisfactory to the Port. The list of deliverables includes:

- Press Release. AMEC's public relations department will prepare and distribute a press release regarding project award.
- Lobby Display. AMEC's San Diego office personnel under the direction of project manager Michelle Woo will be responsible for preparation of a lobby display. The display will include pictures of the MTS devices as well as examples of debris recovered.
- Quarterly Progress Reports. These will include a summary of the amounts and types of trash and debris recovered in the previous quarter as well as any operational issues to report. This report will also summarize activities to take place in the next quarter as well as an accounting of the project top date budget. Quarterly reports will be submitted during the month following each quarter (see proposed schedule below)
- Draft and Final Report. This will include a summary of all monthly monitoring events as well as detailed narrative on the effective of the MTS devices. Any seasonal or spatial differences in trash and debris recovery observed will also be evaluated and presented.
- Presentation. Upon project completion, Michelle Woo will prepare a power point presentation to give to the Board of Port Commissions, Environmental Committee, and/or Environmental Services Department.

Task 5 - Educational/Promotional Outreach (Optional)

Essentially this task involves "getting the word out" about these devices and how they are reducing the amount of trash and debris in Bay waters. AMEC will perform any activities associated with this task at no charge to the Port. AMEC has a long tradition of corporate citizenship in the Southern California community and participates gratis in many outside activities related to environmental sustainability (e.g., coastal cleanup events, the annual Port of Long Beach Green Ports Fest, and others). AMEC envisions that this task might include;

- Preparing a slide show/video of the installation and operation of the MTS devices that could be presented to the public.
- Assisting the marinas/Port in developing a project related website.
- Setting up a demonstration booth an environmental fair such as Earth Day or Day at the Docks.

Since these activities are optional at this point, no matching funds were estimated for this task.

Description of Specific Activities the Proposed Grant will Fund, Including Time Line

The activities to be funded by the grant include:

- Preparation of a detailed work/monitoring plan

- Procurement and installation of four MTS devices
- A one-year operation and monitoring program
- Preparation of all required project deliverables

AMEC's study will be completed over the course of approximately 15 months. This will allow us the opportunity to evaluate the effectiveness of the MTS through and entire dry/wet season and provide time at the end of the test period to prepare draft and final reports. The matrix below details the study schedule, by task, assuming project initiation occurs in August 2009 and continues for 15 months to November 2010.

Table 1. Proposed Schedule

Task Description	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov
Task 1 - Detailed Scope of Work																
Task 2 - Equipment Installation																
Task 3 - Monitoring																
Task 4 – Project Deliverables																
Press Release																
Quarterly Reports																
Draft and Final Reports																
Presentation																

Why is the proposed project important?

Globally, marine plastics plague bays, estuaries, and oceans. In the Pacific Ocean alone, there is an area the size of Texas consisting of small and large floating pieces of plastic. Locally, after almost every significant rainfall in Southern California the beaches are littered with trash and garbage that has made its way down storm drains and out into coastal waters. The abundance of plastics and other debris in the environment and the problem that this pose to San Diego Bay was recently evident during the Creek to Bay cleanup adjacent to the Sweetwater Channel. A very large quantity of plastic debris was collected during this event that would otherwise have ended up in San Diego Bay and beyond. The installation of devices that can remove debris from surface waters on a continual basis are an important first step in helping to solve the debris issue facing San Diego Bay.

Description of how your project benefits San Diego Bay

Not only is floating plastic unsightly and may interfere with navigation in local waterways but marine animals and birds often mistake this plastic as food and may ingest hundreds of pieces of plastic or feed it to their young. They may also become entangled in the plastic which may inhibit their ability to swim, fly or eat often resulting in death. San Diego Bay is home to a thriving community of water fowl and marine organisms. In particular, the protected California Least Tern and Osprey's nest along the water's edge and forage for food in Bay waters, and the warm water in the southern end of the Bay is also home to the protected green sea turtle. There are also several species of marine mammals that come in and out of the bay to feed. All of these organisms are susceptible to ingesting plastics that often resemble their natural food sources or becoming entangled in pieces of fishing line, nets, or 6-pack rings. In addition, because of their physical properties, plastics act a sponge and are known to adsorb organic contaminants at elevated levels.

Description of any partnerships to complete the project

AMEC will be partnering with four marinas: Pier 32 in National City, The Wharf in America's Cup Harbor, Harbor Island West Marina, and Half Moon Bay Marina on Shelter Island

3. Qualifying Experience

AMEC is uniquely qualified to conduct this study. Our involvement with local marina related issues has brought us in close contact with the San Diego-based Clean Marina California Program, as well as numerous clean marina efforts throughout the rest of California. AMEC has also been the recipient of previous Port EC funds for the establishment of used oil centers at two locations within San Diego Bay. In

addition to our well-established clean marina program experience, AMEC's San Diego-based scientists are well qualified to assist the Port with the successful completion of this important project. AMEC has been conducting water quality studies of San Diego Bay since its inception in 1972 and has well over 25 years of providing ecological services to the Port of San Diego. To staff this project, AMEC has a highly experienced group of aquatic scientists, biologists, geographic information systems (GIS) technicians, chemists, and regulatory compliance specialists available.

The following four project descriptions provide a brief summary of AMEC's qualifying experience to conduct the proposed MTS installation.

Collection of Used Oil in a Marina, Port of San Diego

Client Name and Contact	
Port of San Diego Eileen Maher	(619) 686-6532
Project Value	Performance Dates
$40,000	2007
AMEC Team Key Personnel	
▪ Michelle Woo ▪ Greg Boeh – Pier 32 Marina	

In 2007, AMEC was a awarded a Port of San Diego Environmental Committee project to install a used oil recycling center at the newly constructed Pier 32 Marina in National City. The used oil receptacles for the Center were delivered on March 20, 2008. The Center consists of three elements.

1. One 400 gallon steel tank will be used for the collection of used oil. It sits in a secondary containment rust resistant fiberglass housing with a rain resistant lockable lid, level gauge, instruction decals, and service coupling for pumping out the used oil. The housing sits in a spill pan for additional containment.
2. One 55 gallon used oil filter receptacle that sits in a separate fiberglass containment drum cover and spill pan.
3. A similar third container is provided for used oily bilge pads. It, too, has a fiberglass drum cover and spill pan.

Currently AMEC is working with the marina operator on an educational program for the boaters. This will consist of handouts for Best Management Practices when handling used oil, used oil filters, and bilge pads. AMEC is also working with the County of San Diego Hazardous Materials Division to help complete the educational outreach efforts. Based upon the success of the first recycling center installation, the Port authorized AMEC to install a second recycling center at the Harbor Island West Marina on Harbor Island.

On-call Aquatic Studies Contract, Port of San Diego

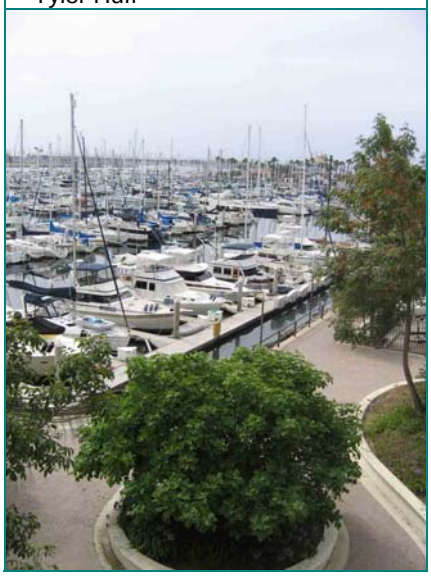
Client Name and Contact	
Port of San Diego Eileen Maher	(619) 686-6532
Project Value	Performance Dates
$650,000	2005-present
AMEC Team Key Personnel	
▪ Barry Snyder ▪ Michelle Woo	▪ Rolf Schottle ▪ Tyler Huff

AMEC was awarded a four year on-call contract to conduct various aquatic sciences related tasks in San Diego Bay. To date, AMEC has performed over 20 individual Request for Services (RFS) projects under this contract. The projects have included a dredged material characterization study for the National City Marine Terminal Phase II wharf extension project; a baseline sediment and water and monthly water quality assessment of the newly opened National City Marina (Pier 32); support for the Port's copper boat paint and Shelter Island Yacht Basin copper total maximum daily load (TMDL) initiatives; wet weather storm water monitoring at the National City, 10th Avenue, and Cruise Ship Terminals; and analytical analyses on various types of environmental media. Additionally, AMEC and it subcontractor partner Merkel and Associates prepared Essential Fish Habitat reports for several construction projects; accomplished debris removal; and monitored eelgrass communities at locations around the Bay. All projects conducted under this contract were successful, fully meeting the Port's expectations.

Clean Marinas Program, Port of Los Angeles

AMEC is working with the Port of Los Angeles to establish a Clean Marinas Program for the marinas in Los Angeles Harbor based upon other successful Clean Marina Programs across the country. AMEC has worked extensively with the Port to identify problem areas within each marina and establish a relationship with the marina owners, managers and boat owners. An educational program was created to help integrate Best Management Practices that will eventually improve the overall visual and water quality within the Harbor. The educational program includes a Clean Marina Guidebook with local resources, state, Federal and local regulations and information about the Clean Marina certification program administered by the Clean Marina California Program. As part of the program a full marina and boat inventory will be conducted to identify and remove potentially problematic vessels from Harbor waters. Air quality at the Harbor will also be addressed in an engine exchange program for recreational boaters. Boaters will be able to turn-in their used 2-stroke engines for a discount on a new 4-stroke or new more environmentally sound 2-stroke. The project involves continual interaction with the local marinas and boaters. All project tasks to date have been successfully implemented and have fully met the Port's expectations.

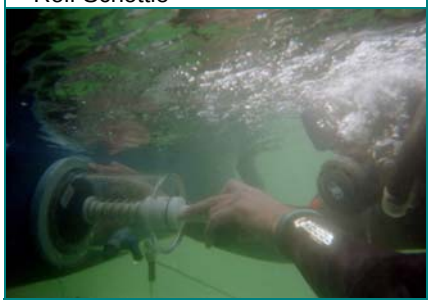
Client Name and Contact	
Port of Los Angeles Kat Prickett, (310) 732-3951	
Project Value	Performance Dates
$296,000	2004-2009
AMEC Team Key Personnel	
▪ Michelle Woo ▪ Tyler Huff	



Shelter Island Yacht Basin Copper TMDL

AMEC was contracted by the Port to design, develop, and implement an in situ-testing program for measuring copper emissions generated as the result of the underwater hull cleaning of recreational boats. Shelter Island Yacht Basin (SIYB) contains over 2,000 recreational vessels that are typically painted with copper containing anti-fouling paints. SIYB has been listed as a CWA 303(d) impaired water body for exceeding the national Ambient Water Quality criterion for total dissolved copper. The problem is so acute that the RWQCB has established a copper specific TMDL for SIYB. The purpose of AMEC's study was to 1) confirm the validity of previous estimates of the passive release of dissolved copper from boat paints, 2) estimate the release of dissolved copper due to active in-water hull cleaning, 3) identify the benefits of using various hull cleaning Best Management Practices for reducing copper discharges, and 4) quantify the particulate copper discharges to the sediments in SIYB. To accomplish this, in situ samples were collected using an enclosed chamber system developed by AMEC and its study partner SPAWAR. The results of the study have been distributed to the Copper Antifouling Paint Subgroup and was presented at the Port's 2007 Conference.

Client Name and Contact	
Port of San Diego Paul Brown	(619) 686-7283
Project Value	Performance Dates
$100,000	2005-2006
AMEC Team Key Personnel	
▪ Rolf Schottle	



Proposition 13, Dominguez Channel Hydrodynamic Modeling

Client Name and Contact	
Port of Los Angeles Andrew Jirik, (310) 732-3914	
Project Value	Performance Dates
$180,400	2004-present
AMEC Team Key Personnel	
▪ Michelle Woo ▪ Tyler Huff	

AMEC is assisting the Port of Los Angeles with management of a State Water Resources Control Board (SWRCB)-funded Proposition 13 project. The Port was awarded $1.3 million to complete a hydrodynamic and water quality study of the Dominguez Channel, an impaired water body on the 303(d) list. The model will be used to describe the transport of stormwater runoff and dry and wet weather waters through the channel and into the Los Angeles Harbor. The model will eventually be used to help develop TMDLs for the Dominguez Watershed and other local surrounding areas. AMEC also supported the Port in writing the application and QAPP which in turn was reviewed by the Regional Water Quality Control Board and State Water Resources Control Board. AMEC is also participating in the water quality sampling, the scientific review board (a select group that reviews the process of sampling methods and model selection), as well as aiding in quarterly progress reports for the Port to the Regional Board.

Water Quality Monitoring Project, Port of Los Angeles

Client Name and Contact	
Port of Los Angeles Kathryn Curtis	(310) 732-3681
Project Value	Performance Dates
$330,000	2004-present
AMEC Team Key Personnel	
▪ Michelle Woo	

At the direction of the Port of Los Angles (Port) Board of Harbor Commissioners, Port staff is conducting a comprehensive evaluation of the impacts of Port operations on local communities and the surrounding environment, including an assessment of the Port's impact on the Los Angeles Harbor aquatic environment. Since the late 1960s, the Port has been conducting monthly, routine water quality monitoring of Los Angles Harbor. These routine analyses have been limited to general water quality properties (e.g., dissolved oxygen, water clarity).

To date, sparse information has been gathered on the levels of chemical contaminants (e.g., heavy metals, pesticides) and fecal indicator bacteria in harbor waters. To address this important data gap, the Port conducted four rounds of enhanced monthly water quality monitoring. The purpose of the effort is to provide a general overview of harbor-wide water quality. The four testing events were preformed quarterly over a 3-year period beginning in May 2005 through September 2008. Collection was done at times corresponding to dry and wet seasons. The enhanced monitoring included analysis for multiple priority pollutants and fecal bacteria. The results of the enhanced water quality testing study compares the findings to applicable state and federal water quality criteria. The Port intends to use this general overview to determine if additional chemical and bacteria testing should be added to its monthly testing regime, and if additional sampling should be limited to certain geographic areas or during wet-weather time periods.

4. Objectives of Grant Proposal

This section summarizes the specific objectives and expected outcomes of the proposed grant project.

Grant Objectives	Expected Outcomes
▪ Procure and install four MTS devices ▪ Develop a set of measurement metrics to test the effectiveness of the devices ▪ Conduct a year-long field study to quantify the successful removal of trash and debris from the marinas ▪ Compile the findings into a final report	▪ A significant reduction in the amount of trash and debris in the selected marinas ▪ Reduction of the trash and debris making its way into San Diego Bay from these sites ▪ Improved water quality and aesthetic appeal within the marinas ▪ Reduction in the effort expended by marina staff in the marginally effective practice of trash collection with pool skimmers ▪ Enhancing San Diego's reputation as an innovator in clean marina/green port BMPs

5. Cost Proposal

AMEC's rate schedule and detailed cost proposal are provided in appendix A.

Matching funds in the amount of $24,800 will be provided by the four marinas. That is $6,200 per unit. Each MTS unit costs $16,400 (which includes shipping). If only one unit is ordered, the cost will be $18,000 each. As required in the RFP, no markup will be added to the purchase price of these units. The matching funds will cover the installation of the units, installation of the electrical box for each unit, the annual cost to run each unit, the bottom cleaning and emptying of the unit, and the annual fees for the dumpster. Based upon the grant request of $74,380, the matching funds will account for approximately 25% of the total project expenditures. The matching funds estimate does not include any additional services that AMEC will provide free of charge for educational/promotional outreach.

Table 2. Cost Detail by Task

Task Description		Cost
Task 1	Detailed Work Plan	$ 3,250
Task 2	Equipment Purchase/Installation/Operation	$ 65,600
Task 3	Field Sampling and Monitoring	$ 0
Task 4	Project Deliverables	$ 5,530
Task 5	Educational/Promotional Outreach (Optional)	No Charge
Grant Request Total		$ 74,380
Matching Funds		$ 24,800
Total Cost of Proposal		$ 99,180

The proposed grant request (table 2) is detailed below by task. Fully burdened hourly rates by staff member and the number of hours allotted to each task is contained in appendix A.

6. Personnel

AMEC key project team member qualifications are summarized below. All key personnel are located in AMEC's San Diego office. Figure 1 depicts AMEC's proposed project team organization and responsibilities.

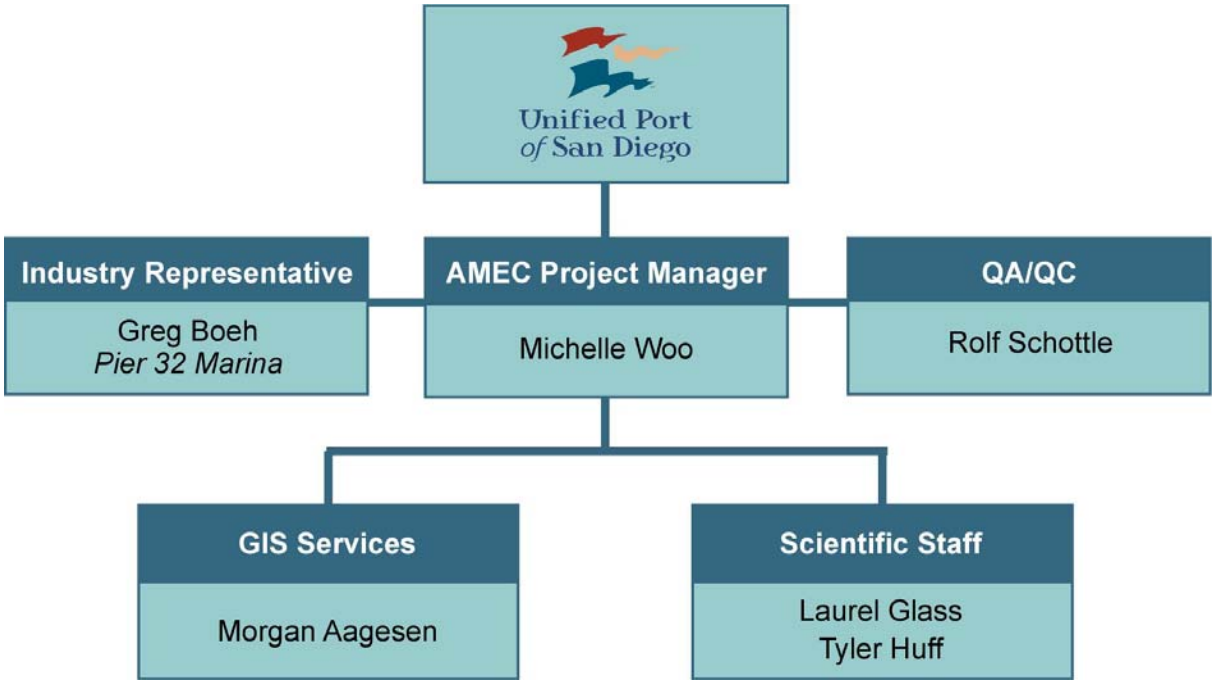


Figure 1. AMEC Team Project Organization

Michelle Woo
Project Manager

- 13 years of experience
- Specialist in sediment/water quality issues
- Responsible for QA/QC of test results/reports

Ms. Woo is a marine scientist with considerable experience in water quality and sediment toxicology studies. Her work includes wetland sediment quality assessment and benthic biota analysis, bay and open ocean water sampling and sediment collection along the southern California coast, and all aspects of aquatic toxicology bioassay testing following USACE, EPA, and ASTM methods. She has prepared sampling and analysis plans, health and safety plans, and characterization reports for water quality and dredging projects. Ms Woo is the grant manager for a Port of San Diego EC grant to install used oil recycling centers as San Diego Bay marinas. She has worked in concert with Mr. Greg Boeh of Pier 32 Marina in the successful installation of one recycling center and proposed installation of the second unit at Harbor Island West Marina. Ms. Woo co-authored the Port of Los Angeles Clean Marina Guidebook which includes educational material for clean boating and environmental marina practices. She was instrumental in gathering data for a port-wide water quality database of over 60 years of Los Angeles Harbor water quality data. Ms. Woo currently manages the Clean Marinas Program and Port-wide Water Quality Study for the Port of Los Angeles.

Tyler Huff
Marine Scientist

- 5 years of experience
- Extensive experience in collection of sediment/soil/water samples
- Knowledge of GIS mapping and use for data presentation

Mr. Huff is a staff marine scientist in AMEC's Aquatic Sciences Group. Prior to joining AMEC, he was an intern with the Port of San Diego Environmental Services Division. He has experience with the field collection of data for sediment/water quality investigations. He has experience with all types of field sampling methods and has extensive boat handling experience. Mr. Huff is also experienced working with GIS including collecting and mapping field data. Mr. Huff has extensive application and knowledge of field sampling methods including vibracore, Van Veen grab, piston coring, secchi disks, electric pumps, and Van Doran bottle. He serves as AMEC's project manager for the baseline and post-baseline study to assessment water and sediment quality in the recently constructed National City Marina. Mr. Huff has led AMEC's stormwater team for collection and analysis of samples collected at the National City, 10th Avenue, and Cruise Ship terminals at the Port of San Diego.

7. Subconsultants

Not applicable.

8. Non-Profit Status

Not applicable.

9. Applicant Disclosure

AMEC's Western Region has not been issued a citation by any federal, state, or local regulatory agency at any time during the past 5 years.

10. Agreement

AMEC accepts the terms and conditions set forth in the sample agreement attached to the RFP as well as the insurance and indemnification clauses.

11. Conflict of Interest

To the best of our knowledge, AMEC does not have any existing or potential conflicts of interest (including other commitments or projects) that will undermine our ability to successfully complete the proposed project.

Appendix A. AMEC Fee Schedule

AMEC EARTH & ENVIRONMENTAL - 2009 RATE SCHEDULE

The hourly labor rates set forth below are valid from January 1, 2009 and are subject to annual revision thereafter. AMEC will provide CLIENT thirty days advance written notice of any such revisions.

Professional Services

CLIENT agrees to reimburse AMEC for all hours worked by professionals at the following classifications and associated hourly labor rates. For expert witness testimony and related services in connection with litigation, CLIENT agrees to reimburse AMEC for all hours worked by professionals at the following classifications, but at one and one half times the associated hourly labor rates.

Classification	Rate/Hour	Classification	Rate/Hour
Professional Levels 1	$55.00	Professional Level 14	$120.00
Professional Levels 2	$60.00	Professional Level 15	$130.00
Professional Levels 3	$65.00	Professional Level 16	$140.00
Professional Level 4	$70.00	Professional Level 17	$145.00
Professional Level 5	$75.00	Professional Level 18	$155.00
Professional Level 6	$80.00	Professional Level 19	$165.00
Professional Level 7	$85.00	Professional Level 20	$170.00
Professional Level 8	$90.00	Professional Level 21	$180.00
Professional Level 9	$95.00	Professional Level 22	$190.00
Professional Level 10	$100.00	Professional Level 23	$200.00
Professional Level 11	$105.00	Professional Level 24	$210.00
Professional Level 12	$110.00	Professional Level 25	$220.00
Professional Level 13	$115.00	Professional Level 26	$240.00

Technician Services

CLIENT agrees to reimburse AMEC for all hours worked by technicians at the following classifications and associated hourly labor rates.

Classification	Rate/Hour	Overtime	Classification	Rate/Hour	Overtime
Technician Level 1	$27.50	$40.50	Technician Level 10	$55.00	$82.50
Technician Level 2	$30.00	$45.00	Technician Level 11	$60.00	$90.00
Technician Level 3	$32.50	$48.75	Technician Level 12	$65.00	$97.50
Technician Level 4	$35.00	$52.50	Technician Level 13	$70.00	$105.00
Technician Level 5	$37.50	$56.25	Technician Level 14	$75.00	$112.50
Technician Level 6	$40.00	$60.00	Technician Level 15	$80.00	$120.00
Technician Level 7	$42.50	$63.75	Technician Level 16	$85.00	$127.50
Technician Level 8	$45.00	$67.50	Technician Level 17	$90.00	$135.00
Technician Level 9	$47.50	$71.25	Technician Level 18	$95.00	$142.50

Administrative Services

CLIENT agrees to reimburse AMEC for all hours worked by administrative staff at the following classifications and associated hourly labor rates.

Classification	Rate/Hour	Overtime	Classification	Rate/Hour	Overtime
Administrative Level 1	$35.00	$52.50	Administrative Level 6	$60.00	$90.00
Administrative Level 2	$40.00	$60.00	Administrative Level 7	$65.00	$97.50
Administrative Level 3	$45.00	$67.50	Administrative Level 8	$70.00	$105.00
Administrative Level 4	$50.00	$75.00	Administrative Level 9	$75.00	$112.50
Administrative Level 5	$55.00	$82.50	Administrative Level 10	$80.00	$120.00

A/E Fee Itemization Sheet		Task 1		Task 2		Task 2		Task 4		Task 5		Project Totals	
		Work Plan		Equipment Purchase/ Installation/ Operation		Field Sampling and Monitoring		Project Deliverables		Educational (Option)			
Item	**Rate/Hr**	**Hrs**	**Cost**	**Hrs**	**Cost**	**Hrs**	**Cost**	**Hrs**	**Cost**	**Hrs**	**Cost**	**Hrs**	**Cost**
Part I - Direct Labor													
Project Manager (Woo) 611	$ 105	20	-	-	-	-	-	30	$ 3,150	0	-	50	$ 5,250
Staff Scientist (Huff) 610	$ 100	4	$ 400	0	-	0	-	10	$ 1,000	0	-	14	$ 1,400
QA/QC (Schottle) 616	$ 140	2	$ 280	-	-	-	-	2	$ 280	-	-	4	$ 560
Word Processing (Carey) 808	$ 70	0	-	0	-	0	-	4	$ 280	0	-	4	$ 280
Graphics (Weinberg) 517	$ 90	1	$ 90	0	-	0	-	3	$ 270	0	-	4	$ 360
Geographic Information Systems (Aagesen) 607	$ 85	2	$ 170	-	-	-	-	4	$ 340	-	-	6	$ 510
Project Administrator (Cuevas) 611	$ 105	2	$ 210	0	-	0	-	2	$ 210	0	-	4	$ 420
Total Direct Labor		31	$ 3,250	-	-	-	-	55	$ 5,530	-	-	86	$ 8,780
Part II - Other Direct Costs													
Trash Skimmer Equipment	$ 16,400			4	$ 65,600		-		-		-	4	$ 65,600
Total ODCs					$ 65,600		-		-		-		$ 65,600
Grant Request Amount			$ 3,250		$ 65,600		-		$ 5,530		-		$ 74,380
Matching Funds			-		$ 12,348		$ 12,452		-		-		$ 24,800
Total Proposal Cost			$ 3,250		$ 77,948		$ 12,452		$ 5,530		-		$ 99,180

Appendix B. Resumes of Key Personnel

Michelle Woo

Project Manager

Professional Summary

Ms. Woo has 12 years of experience in environmental assessment with the focus of her work in water quality and sediment toxicology. She has been with AMEC for 7 years. Her work includes wetland sediment quality assessment and benthic biota analysis, bay and open ocean water sampling, and sediment collection along the Southern California coast and all aspects of aquatic toxicology bioassay testing following ASTM methods. She has managed the 2003 and 2004 stormwater analysis and 2003 dry weather monitoring for the Port of San Diego. She is also managing the development of the Clean Marinas Program and the Port-wide water quality study throughout Los Angeles harbor. Ms. Woo has been involved in a variety of wastewater and soil bioassay testing following ASTM methods. She is well versed in bioassay and bioaccumulation testing. Ms. Woo has been involved in benthic invertebrate analysis. Major projects include the identification of marine and freshwater species from San Diego tidal wetlands, the Port of Long Beach, and throughout the Southern California Bight.

Education
- BS, General Biology, 1995

Certifications/Registrations
- OSHA 40-Hour HAZWOPER Certified (Section 1910.120), Initial Training 2002, Annual Refresher Training
- American Red Cross: Workplace Training First Aid and Adult CPR, Renewed 2007
- SSI Open Water Certified SCUBA Diver, 1993
- Lifeguard Certified, 2000

Specialized Training
- Thesis Research: Intracellular metal transfer analysis using coupled HPLC-ICPMS
- Microsoft ACCESS database training

Memberships
- Association of Environmental Professionals (AEP)
- Southern California Society of Environmental Toxicology and Chemistry (SETAC)
- Marina Recreation Association (MRA)

Relevant Project Experience

Used Oil Recycling Center Installation, Port of San Diego, San Diego, CA. Ms. Woo is the project manager of a Port of San Diego environmental committee grant project to install a used oil recycling center at the newly constructed Pier 32 marine in National City. The used oil receptacles for the Center were delivered on March 20, 2008. The Center consists of three elements: 1) a 400 gallon steel tank will be used for the collection of used oil. It sits in a secondary containment rust resistant fiberglass housing with a rain resistant lockable lid (which will be locked once in use), level gauge, instruction decals, and service coupling for pumping out the used oil. The housing sits in a spill pan for additional containment; 2) One 55 gallon used oil filter receptacle that sits in a separate fiberglass containment drum cover and spill pan; and 3) a similar third container is provided for used oily bilge pads. Currently Ms. Woo is working with the marina operator on an educational program for the boaters. This will consist of handouts for Best Management Practices when handling used oil, used oil filters, and bilge pads. AMEC is also working with the County of San Diego Hazardous Materials Division to help complete the educational outreach efforts. Based upon the success of the first recycling center installation, the Port authorized AMEC to install a second recycling center at the Harbor Island West Marina on Harbor Island.

Clean Marinas Program, Port of Los Angeles, Los Angeles Harbor, CA. Project manager working with the Port to establish a Clean Marinas Program for the marinas in Los Angeles Harbor based upon other successful Clean Marina Programs across the country. AMEC has worked extensively with the Port to identify problem areas within each marina and establish a relationship with the marina owners, managers and boat owners. An educational program was created to help integrate Best Management Practices that will eventually improve the overall visual and water quality within the Harbor. The educational program includes a Clean Marina Guidebook with local resources, state, federal, and local regulations, and information about the clean marina certification program administered by the Clean Marina California Program. As part of the program a full marina and boat inventory will be conducted to identify and remove potentially problematic vessels from harbor waters. Air quality at the harbor will be addressed in an engine exchange program for recreational boaters. The project involves continual interaction with the local marinas and boaters. Ms. Woo is managing this project.

Rolf Schottle

Quality Assurance/Quality Control

Professional Summary

Mr. Schottle has over 20 years of multidisciplinary experience in analytical chemistry, construction oversight, marine/terrestrial/hazardous waste sampling, and analysis and data reporting. He has managed the technical, fiscal, and marketing aspects of numerous analytical projects for private, state, and federal clients. Mr. Schottle serves as a senior marine scientist in the Aquatic Science Group at AMEC's San Diego office. He currently provides technical expertise and construction engineering oversight for remedial investigations conducted at both marine and terrestrial hazardous waste sites. His responsibilities include laboratory procurement and coordination, auditing, field management, supervision of subcontractors, and interaction with clients and regulatory agencies. In conjunction with these responsibilities, Mr. Schottle conducts data evaluation and interpretation, and design and preparation of field sampling and quality assurance project plans.

Education
- BA, Biochemistry, 1985

Certifications/Registrations
- Hazardous Materials Management, Professional Certificate, University of California at San Diego, 1994
- OSHA 40-Hour Hazardous Waste Operations and Emergency Response (HAZWOPER) Training (Section 1910.120), Initial Certification 1986, with Annual 8-Hour Refresher Training
- CPR/First Aid, since 1990
- USMC Range Safety Officer (RSO), 2006
- PADI Dive Instructor, 1983

Mr. Schottle's past experience includes project management, inorganic instrumentation techniques, quality assurance, and health and safety, as well as geotechnical field experience in air sampling, well drilling, logging, sampling, and development. As a marine survey scientist, Mr. Schottle has extensive expertise in sediment and tissue chemistry and sampling, research diving, and vessel handling. Mr. Schottle has provided technical management oversight for individuals with diverse backgrounds under a variety of challenging work environments.

Relevant Project Experience

Pier 12 Sediment Sampling and Testing, SAIC, San Diego, CA. As survey scientist, assisted in the collection and characterization of sediment cores.

Water Quality Monitoring NPDES Permit Monitoring for University of California at San Diego, Scripps Institution of Oceanography, San Diego, CA. Project manager for UCSD/SIO NPDES discharge monitoring program. Concurrent responsibilities include project QA manager for ecosystem assessment and special studies. As part of the AMEC team, periodically collects and analyzes water and sediment samples from various oceanside and underwater locations where return seawater from numerous aquariums and stormwater are discharged. In addition, AMEC scientists are helping SIO conduct special studies to understand any potential impacts to the ecosystem within the ASBS.

Port of San Diego On-Call Aquatic Studies Contract, San Diego, CA. Project scientist on a 2 year on-call contract to conduct various aquatic sciences related tasks.

- Port of San Diego, Copper Loading Assessment for In-water Hull Cleaning Following Natural Fouling. Project manager responsible for the design, development, and implementation of an in situ testing program for measuring copper emissions generated as a result of the underwater hull cleaning of recreational boats in Shelter Island Yacht Basin which contains over 2,000 recreational vessels that are typically painted with copper containing anti-fouling paints. The purpose of the study was to 1) confirm the validity of previous estimates of the passive release of dissolved copper from boat paints, 2) estimate the release of dissolved copper due to active in-water hull cleaning, 3) identify the benefits of using various hull cleaning Best Management Practices (BMPs) for reducing dissolved copper discharges, and 4) quantify the particulate copper discharges to the sediments in SIYB.
- Zinc Study, Port of San Diego, CA. As project chemist, administered QA/QC aspects for in situ leach test of panels coated with zinc biocide.

Tyler Huff

Marine Scientist

Professional Summary

Mr. Huff is a staff marine scientist with 4 years of experience in the environmental field. He has experience with several types of field sampling methods and has extensive boat handling experience. He also has experience with Geographic Information Systems (GIS) including field collection of data and post-processing to create data layers.

Field Sampling Methods. Mr. Huff has extensive application and knowledge of field sampling methods. These include sediment clamshell grabs, vibracoring, piston coring, CTD (connectivity, temperature, dissolved oxygen) monitoring probe, secchi disks, horiba, electric pumps, and Van Dorn bottle, all while sampling from boat, kayak, shore, or mudflats.

Geographic Information Systems. Mr. Huff's experience working with GIS includes collecting and mapping field data of endangered California least tern nesting sites, mitigation planting locations, using GPS in the aquatic environment to locate sediment and water sampling locations, and mapping the storm drain inlets and outfalls that flow into the San Diego Bay.

Education
- BS, Environmental Systems (Area of focus: Ecology, Behavior, and Evolution), 2003

Certifications/Registrations
- OSHA 40-Hour Hazardous Waste Operations and Emergency Response (HAZWOPER) Training (Section 1910.120), Initial Certification May 2004, with Annual 8-Hour Refresher Training
- California Department of Fish and Game/NOAA, Caulerpa Survey and Monitoring Certification, Initial Certification July 2004; Renewed December 2006
- American Red Cross: Adult CPR and First Aid certified (maintained annually/triennially)
- PADI Open Water Diver SCUBA Certification, December 2004
- PADI Advanced Open Water Diver SCUBA Certification, June 2005

Memberships
- Association of Environmental Professionals (AEP), 2007
- San Diego Environmental Professionals (SDEP), 2007

Relevant Project Experience

On-Call Aquatic Studies Contract, Port of San Diego, CA. Marine scientist on a 2-year on-call contract to conduct various aquatic sciences related tasks for the Port of San Diego. AMEC is currently providing analytical chemistry support, conducting eelgrass surveys and essential fish habitat analyses in San Diego Bay, and assisting the Environmental Services Department staff with preparation of the State of the Bay Report. AMEC has provided support for maintenance dredging projects; marine terminal and airport stormwater testing; dry weather runoff monitoring; and bay hotspots sediment evaluations. AMEC has also prepared Sampling and Analysis Plans for proposed dredging projects (America's Cup Harbor, 10th Avenue Marine Terminal) and remediation projects; conducted bioassay testing on stormwater samples from Chollas Creek; assisted with the America's Cup Harbor boatyard sediment remediation project; prepared a shoreline enhancement report; and assisted with the permitting for the National City Marine Terminal Wharf Extension Project.

Clean Marinas Program, Port of Los Angeles, Los Angeles Harbor, CA. Marine scientist as part of AMEC team working with the Port of Los Angeles to establish a Clean Marinas Program for the marinas in Los Angeles Harbor based upon other successful Clean Marina Programs across the country. The program includes the identification of problem areas within each marina, establishing a relationship with the marina managers and boat owners, and creating an educational program to help integrate Best Management Practices that will eventually improve the overall visual and water quality within the Harbor.

Morgan Aagesen

GIS Analyst

Professional Summary

Ms. Aagesen has several years experience utilizing GIS and remote sensing technologies in areas such as natural resource conservation, habitat restoration and preservation, land use planning and time series change analysis. Ms. Aagesen has extensive knowledge in both ESRI GIS products as well as ERDAS Imagine. This allows her to integrate satellite and aerial image processing with GIS analysis to implement a wide range of spatial analysis tasks. She has experience with in-situ data collection, data processing and GIS database design and development. Other areas of expertise include spatial statistics analysis, change detection utilizing digital image processing, and map design and production using ArcGIS, ArcInfo, 3-D analysis, and Spatial Analysis. Her background includes conservation biology education, native ecosystem restoration, and a wide variety of biological field work, which allows her to better understand and design GIS projects within the environmental consulting field.

Education
▪ BA, Geography, 2006
▪ BA, International Security and Conflict Resolution, 2003
Specialized Training
▪ Creating and Integrating Data for Natural Resource Applications, ESRI Online Class, April 2007
▪ Trimble GeoXT and GARP Desktop Workshop, Lisa Canale, University of Hawaii at Hilo, 2007
GIS Software
▪ ArcGIS 3.3, 9.x, 9.2
▪ ERDAS Imagine
▪ Freehand
▪ Modis Tools
▪ Trimble GeoXT
▪ GARP Desktop

As a geography student at San Diego State University, Ms. Aagesen completed a variety of remote sensing, GIS, digital cartography, and spatial statistic classes. As a teaching assistant and research assistant at the University of Hawaii, she was able to take the skills she learned at San Diego State University and utilize them in hands-on, independent research projects.

Relevant Project Experience

Vernal Pool Group 68, Camp Pendleton, San Diego County, CA. GIS analyst responsible for the data maintenance and analysis of long-term vernal pool surveys. Duties include the creation of maps based on field data that show the location of vernal pools as well as the species present. Calculation of the area of vernal pools as well as identifying pools impacted by soil surveys and auger points. Other duties include analysis of data provided by Camp Pendleton compared to the data collected by AMEC biologists.

AFCEE 4-P. Title I, Title II, and Other Architect-Engineering Services Primarily for Environmental Projects Including Restoration, Conservation, Planning, Compliance, and Pollution Prevention. (Contract No.: F41624-03-D-8591)

- **Endangered Species Surveys, San Diego Air Force Space Surveillance Station (AFSSS), CA.** GIS analyst responsible for biological resource data management and analysis. Tasks include mapping of USFWS designated critical habitat within the study site, mapping the location and area of hostplants and producing vegetation community maps.

Torres Martinez Wetland Inventory, Torres Martinez Tribal Government, Imperial and Riverside County, CA. GIS analyst responsible for the creation of a series of aerial image based maps that will be used for wetland identification. After the wetlands have been identified through aerial image interpretation and groundtruthing, the data will be used to create a series of maps that positively identifies wetland resources on Torres Martinez lands. The GIS data will be transferred to Torres Martinez and posted on their water resources website for public use.

Coachella Canal Lining Project, Large Mammal Monitoring Program, Coachella Valley Water District, Coachella, CA. GIS analyst responsible for analyzing and maintaining monthly data pertaining to large mammal usage of permanent and temporary data. The data is used to create maps that show location and utilization levels of siphons, permanent and temporary drinkers. The long term trends are used to make decisions on the locations and quantity of drinkers that will be placed along the canal.

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Appendix C. Marina Trash Skimmer Equipment Specifications

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MARINA TRASH SKIMMER

TRASH - A PROBLEM OF GLOBAL DIMENSIONS: We have seen all the stories and if we are lucky enough to live close to, or have the opportunity to spend any time around our waterways, lakes and ocean beaches, we have witnessed the buildup of trash. Concerns once voiced only by environmentalists are now being echoed at every level of society. Governments and industry are stepping up to address the problem but need support implementing solutions. Some of the worst offenders are plastics. Because most forms of plastic float and do not break down, it creates unsightly and often times deadly hazards in our waterways and oceans.

The **"MARINA TRASH SKIMMER"** – A PRODUCT WHO'S TIME HAS ARRIVED: Marina Accessories, Inc. (MAI), and Applied Water Technologies, (AWT), have combined forces to bring to market, the Marina Trash Skimmer, (MTS). Operating on common 20 Amp 125 Volt power the MTS employs a patented technology of water displacement and works round the clock to collect and retain all floating trash in its vicinity. With a relatively small footprint, (6' wide x 4' deep x 18" freeboard), the MTS fits easily into any area of a marina or waterway. Its whisper quiet operation will not disturb the neighbors.

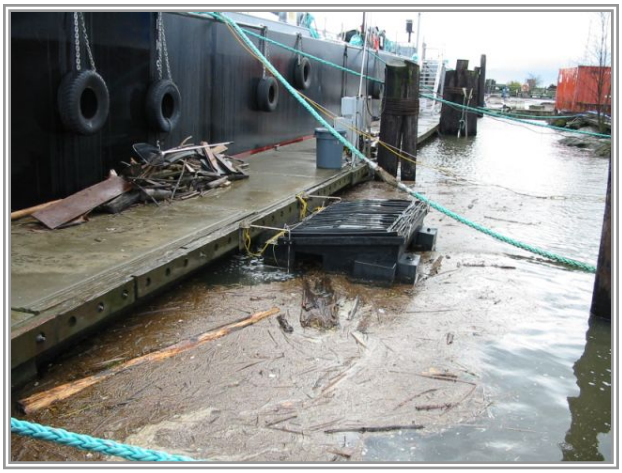
TRASH COLLECTION TIME REDUCED: Keeping marina waterways clear of trash can be very time consuming. Instead of chasing trash around their facilities as it floats back and forth with the tides, marina and waterfront staff need only clean out the Marina Trash Skimmer as it fills up. Collection intervals will vary with the amount of trash in the area.

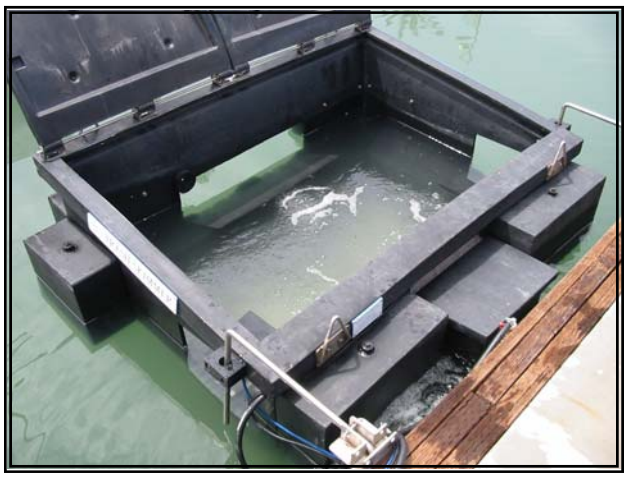
WATER QUALITY IMPROVES: The MTS not only collects trash such as Styrofoam cups, plastic and glass bottles, plastic bags, wood and cardboard, but also remove the oil sheen from the water's surface, so often seen around fueling stations. By simply adding a bilge absorbent pad to the MTS all traces of the oil sheen are collected and can be disposed of properly and safely.

WATER QUALITY MONITORING: Government agencies and others responsible for waterways will find the MTS a very useful tool to gauge the need for cleanup programs and monitor program success once they are underway.

Customer review (11-25-08) The skimmer is working beautiful, and it's performance has exceeded our expectations. Without a doubt it was a great investment. We have great reviews from our condo unit owners that live adjacent to the skimmer location, who have recognized the performance of this new equipment. **Best regards, Gabriel Ley, Marina Manager, Marina Costa Baja. La Paz, Mexico**

For further details, contact Marina Accessories, Inc. Contact details shown below.





Marina Accessories, Inc., PO Box 8, Bellingham, WA 98227
Toll Free: 1-800-585-6890 Office: 1-360-676-7500 Fax: 1-360-392-1443
E-mail: mai@marina-accessories.com Web-site: www.marina-accessories.com

MARINA TRASH SKIMMER—SPEC SHEET

Trash Skimmer construction:

Main tank - 1/2" (12mm) thick throughout, Roto-Molded LLDPE + Regrind.
Flotation Tanks - Roto-molded from non-corrosive polyethylene, one piece heavy wall construction with Stainless Steel inserts.
Fasteners - All 304 Stainless Steel or better.

Water Circulation Unit:

- 1 HP 120 Volt *Oil Free* motor
- Stainless steel motor shaft and housing.
- Dual internal seals and double lip shaft seal.
- True continuous duty 120V or 230V Single Phase motor.
- High performance propeller and renewable Zinc anode for corrosion protection in harsh Saltwater environments.
- All Weather, Oil resistant power cord.
- Full Two Year Warranty - "Peace of mind"

Aeration Pump:

- 46W 120V Continuous duty air pump.
- Housed within the Trash Skimmer control panel.
- Adjustable air flow to suit conditions

Control Panel:

- Housed within a Hoffman fiberglass enclosure for trouble free service.
- Meets of exceeds all UL, CUL & CSA Standards as well as any international standards.

MultiTrode Level Control:

- Ensures trouble free performance in this debris filled environment.

Installation:

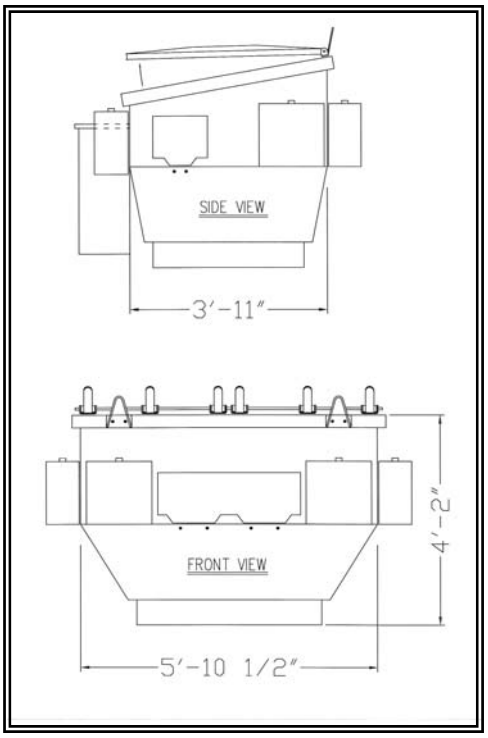
- The Trash Skimmer can be mounted to any floating dock system using the mounting brackets provided.
- MAI will work with any customer to ensure there is a secure mounting system in any other situation.

Electrical Power Requirements:

- Power input - 30A 120V GFIC breaker. Can operate on as little as 15A 120V power supply.
- The Control Panel can be hard wired to available power or a power cord supplied.

International Electrical Compatibility:

- All electrical components are available in either 120 Volt 60 Hz or 230 Volt 50 Hz.



Operating Cost Estimate:

- The Trash Skimmer has used approximately 26 Kwh / day. In the USA North West this works out to $1.30 / day.

Limited Warranty:

- Trash Skimmer tank roto molded parts - Three years.
- Water circulation unit - Two years.
- Aeration Pump - One years.
- Control Panel - One years.

Marina Accessories, Inc., PO Box 8, Bellingham, WA 98227
Toll Free: 1-800-585-6890 Office: 1-360-676-7500 Fax: 1-360-392-1443
E-mail: mai@marina-accessories.com Web-site: www.marina-accessories.com