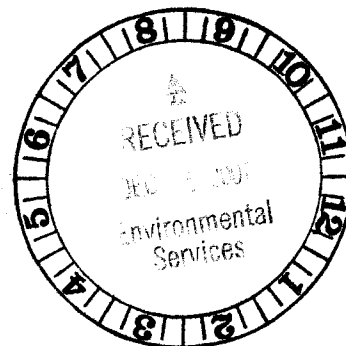


Appendix A

EPA Documentation

December 4, 2007

Martha Villarreal, Grant Specialist
U. S. Environmental Protection Agency, Region 9
Grants Management Office, MTS-7
75 Hawthorne Street
San Francisco, CA 94105



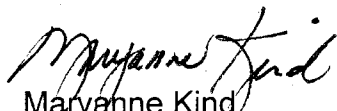
RE: Grant Agreement NP-00946501 dated 9/25/07
Pollution Prevention Grants –
Alternatives to Copper Antifouling Paints for Marine Vessels

Dear Ms. Villarreal:

On behalf of the San Diego Unified Port District, I am pleased to return a fully executed copy of the Grant Agreement for the Alternatives to Copper Antifouling Paints for Marine Vessels Project. In a telephone conversation today, Andre Villasenor indicated that he is processing our request for a no-cost, six-month extension to the grant project for both the budget and project periods (from 10/1/07-12/31/09 to 10/1/07-06/30/10). He indicated that he will let me know as soon as the Change Request has been approved, and then I will send him the changes to the project schedule as per the six-month extension.


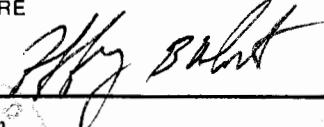
Thank you for your assistance; we look forward to working with the EPA. Should you have any questions or require additional information, please do not hesitate to contact me.

Sincerely,



Maryanne Kind
Grants Coordinator

cc: Andre Villasenor, EPA Project Officer
Karen Holman, Port Project Manager

	U.S. ENVIRONMENTAL PROTECTION AGENCY Grant Agreement		ASSISTANCE ID NO.			DATE OF AWARD 09/25/2007
			PRG	DOC ID	AMEND#	
			NP - 00946501 - 0			MAILING DATE 10/02/2007
			TYPE OF ACTION New			
PAYMENT METHOD: Advance			ACH# pend			
RECIPIENT TYPE: Special District			Send Payment Request to: Las Vegas Finance Center, Fax (702) 798-2423			
RECIPIENT:			PAYEE:			
San Diego Unified Port District 3165 Pacific Highway San Diego, CA 92101 EIN: 95-2241453			San Diego Unified Port District 3165 Pacific Highway San Diego, CA 92101			
PROJECT MANAGER		EPA PROJECT OFFICER		EPA GRANT SPECIALIST		
Karen Holman 3165 Pacific Highway San Diego, CA 92101 E-Mail: kholman@portofsandiego.org Phone: 619-725-6073		Andre Villasenor 75 Hawthorne Street, WST-7 San Francisco, CA 94105 E-Mail: villasenor.andre@epa.gov Phone: 213-244-1813		Martha Villarreal Grants Management Office, MTS-7 E-Mail: Villarreal.Martha@epamail.epa.gov Phone: 415-972-3666		
PROJECT TITLE AND DESCRIPTION Pollution Prevention Grants - Alternatives to Copper Antifouling Paints for Marine Vessels The aim of this project is to reduce or eliminate the need for copper coating (which adversely impacts water bodies) on boats in the Shelter Island Yacht Basin in San Diego Bay. The grantee will investigate alternative, safer coatings and application methods, thus protecting water bodies and human health. This assistance agreement provides partial federal funding in the amount of \$100,869.						
BUDGET PERIOD 10/01/2007 - 12/31/2009		PROJECT PERIOD 10/01/2007 - 12/31/2009		TOTAL BUDGET PERIOD COST \$380,033.00		TOTAL PROJECT PERIOD COST \$380,033.00
NOTICE OF AWARD Based on your application dated 06/08/2007, including all modifications and amendments, the United States acting by and through the US Environmental Protection Agency (EPA), hereby awards \$100,869. EPA agrees to cost-share % of all approved budget period costs incurred, up to and not exceeding total federal funding of \$100,869. Such award may be terminated by EPA without further cause if the recipient fails to provide timely affirmation of the award by signing under the Affirmation of Award section and returning all pages of this agreement to the Grants Management Office listed below within 21 days after receipt, or any extension of time, as may be granted by EPA. This agreement is subject to applicable EPA statutory provisions. The applicable regulatory provisions are 40 CFR Chapter 1, Subchapter B, and all terms and conditions of this agreement and any attachments.						
ISSUING OFFICE (GRANTS MANAGEMENT OFFICE)				AWARD APPROVAL OFFICE		
ORGANIZATION / ADDRESS				ORGANIZATION / ADDRESS		
U.S. EPA, Region 9 Grants Management Office, MTS-7 75 Hawthorne Street San Francisco, CA 94105				U.S. EPA, Region 9 EPA Region 9, WST-1 75 Hawthorne Street San Francisco, CA 94105		
THE UNITED STATES OF AMERICA BY THE U.S. ENVIRONMENTAL PROTECTION AGENCY						
SIGNATURE OF AWARD OFFICIAL Digital signature applied by EPA Award Official		TYPED NAME AND TITLE Jane Diamond, Assistant Regional Administrator			DATE 09/25/2007	
AFFIRMATION OF AWARD BY AND ON BEHALF OF THE DESIGNATED RECIPIENT ORGANIZATION						
SIGNATURE 		TYPED NAME AND TITLE Jeffrey McEntee, Chief Financial Officer Treasurer			DATE 12/4/07	



NP - 00946501 - 0 Page 2

Assistance Program (CFDA)	Statutory Authority	Regulatory Authority
66.708 - Pollution Prevention/Incentives States	Pollution Prevention Act of 1990: Sec. 6605	40 CFR PTS 31 & 35 SUBPT A

Fiscal									
Site Name	Req No	FY	Approp. Code	Budget Organization	PRC	Object Class	Site/Project	Cost Organization	Obligation / Deobligation
	0709JR7107	07	E1	09J2	502C13E	4183		TPPT000	100,309
	0709JR7107	07	E1C	09J2	502C13E	4183		TPPT000	560
									100,869

Budget Summary Page

Table A - Object Class Category (Non-construction)	Total Approved Allowable Budget Period Cost
1. Personnel	\$80,961
2. Fringe Benefits	\$49,072
3. Travel	\$15,600
4. Equipment	\$0
5. Supplies	\$2,575
6. Contractual	\$231,825
7. Construction	\$0
8. Other	\$0
9. Total Direct Charges	\$380,033
10. Indirect Costs: % Base	\$0
11. Total (Share: Recipient % Federal %.)	\$380,033
12. Total Approved Assistance Amount	\$100,869
13. Program Income	\$0
14. Total EPA Amount Awarded This Action	\$100,869
15. Total EPA Amount Awarded To Date	\$100,869

Administrative Conditions

1. An interim Financial Status Report (FSR), Standard Form 269A (Rev. 7/97), covering the period from "project/budget period start date" to September 30 of each calendar year shall be submitted to the Grants Management Office, MTS-7, no later than December 31 of the same calendar year. The initial FSR is due December 31, 2008. The final FSR covering the entire project period shall be submitted to the U.S. EPA Las Vegas Finance Center, PO Box 98515, Las Vegas, NV 89193-8515, within 90 days after the end of the project period according to the recipient's respective Code of Federal Regulations Part 30.52(a)(1)(iv) and 30.71(a), or Part 31.23(b) and 31.41(b) (as applicable). The LVFC will make adjustments, as necessary, to obligated funds after reviewing and accepting a final Financial Status Report. Recipients will be notified and instructed by EPA if they must complete any additional forms for the closeout of the assistance agreement.
2. The recipient will provide timely reporting of cash disbursements and balances through annual submission (January - December) of a Federal Cash Transactions Report (SF272 and SF272A). The appropriate reports must be submitted to the Las Vegas Finance Center within 15 working days following the end of each calendar year. The recipient may access these forms and the instructions for submission at <http://www.epa.gov/ocfo/finservices/payinfo.htm>.
3. The recipient shall comply with the Single Audit Act and the reporting requirements set forth in OMB Circular A-133.
4. The recipient agrees to complete and submit to the Grants Management Office, MTS-7, a MBE/WBE Utilization Report (EPA Form 5700-52A), within 30 days after the end of the Federal fiscal year, i.e., by October 30 of each calendar year. Negative reports are required.
5. In accordance with EPA's Program for Utilization of Small, Minority and Women's Business Enterprises in procurement under Federal assistance programs, the recipient agrees to:
 - a) Accept the applicable "fair share" goals negotiated with EPA by the CA State Water Resources Control Board, as follows:

	<u>MBE</u>	<u>WBE</u>
Construction	24%	6%
Equipment	22%	26%
Services	30%	31%
Supplies	29%	20%

If the recipient does not want to rely on the applicable State's MBE/WBE "fair share" goals, the recipient agrees to submit proposed MBE/WBE "fair share" goals based on availability of qualified minority and women-owned businesses to do work in the relevant market for construction, services, supplies, and equipment.

"Fair share" objectives must be submitted to Joe Ochab, MTS-1, within 30 days of award and approved by EPA no later than 30 days thereafter.

b) Ensure to the fullest extent possible that at least the applicable "fair share" objective {see a) above} of Federal funds for prime contracts for supplies, construction, equipment or services are made available to organizations owned or controlled by socially and economically disadvantaged individuals, women and historically black colleges and universities.

c) Include in its bid documents applicable "fair share" objectives {see a) above} and require all of its prime contractors to include in their bid documents for subcontracts the negotiated fair share percentages.

d) Follow the six affirmative steps stated in 40 CFR Section 30.44(b), Section 31.36(e), Section 35.3145(d), or Section 35.6580(a), as appropriate.

e) In the event race and/or gender neutral efforts prove to be inadequate to achieve a fair share objective for MBE/WBEs, the recipient agrees to notify EPA in advance of any race and/or gender conscious action it plans to take to more closely achieve the fair share objective.

f) Until the recipient has completed its fair share negotiations with EPA, it agrees to apply the main State agency's fair share objectives. Once the recipient has completed its fair share negotiations with EPA, it will apply those objectives. The recipient also agrees to include in its bid documents the applicable "fair share" objectives and require all of its prime contractors to include in their bid documents for subcontracts the applicable "fair share" percentages and to comply with paragraphs (c) through (e) above.

6. Payment to consultants. Per 40 CFR Part 31.36(j), EPA's participation in the salary rate (excluding overhead and travel) paid to individual consultants retained by recipients or by a recipient's contractors or subcontractors shall be limited to the maximum daily rate for a Level IV of the Executive Schedule, to be adjusted annually. This limit applies to consultation services of designated individuals with specialized skills and if the terms of the contract provide the recipient with responsibility for the selection, direction, and control of the individuals who will be providing services under the contract at an hourly or daily rate of compensation. As of January 1, 2007, the rate is \$557.28 per day and \$69.66 per hour. This rate does not include overhead or travel costs and the recipient may pay these in accordance with its normal travel practices.

Subagreements with firms or individuals for services which are awarded using the procurement requirements in 40 CFR Parts 30 or 31, as applicable, are not affected by this limitation unless the terms of the contract provide the recipient with responsibility for the selection, direction, and control of the individuals who will be providing services under the contract at an hourly or daily rate of compensation. See 40 CFR Part 31.36(j)(2) or Part 30.27(b).

7. The cost principles of 2 CFR 225, 230, or 220 (formerly OMB Circular A-87, A-122, or A-21) are applicable to this award. Since there are no indirect costs included in the assistance budget, they are not allowable under this Assistance Agreement.

8. The recipient agrees to comply with Title 40 CFR Part 34, *New Restrictions on Lobbying*. The recipient shall include the language of this provision in award documents for all subawards exceeding \$100,000, and require that subrecipients submit certification and disclosure forms accordingly.

In accordance with the Byrd Anti-Lobbying Amendment, any recipient who makes a prohibited expenditure under Title 40 CFR Part 34 or fails to file the required certification or lobbying forms shall be subject to a civil penalty of not less than \$10,000 and not more than \$100,000 for each such expenditure.

9. Pursuant to EPA's annual Appropriations Act, the chief executive officer of this recipient agency shall require that no grant funds have been used to engage in lobbying of the Federal Government or in litigation against the United States unless authorized under existing law. As mandated by this Act, the recipient agrees to provide certification to the award official via EPA Form 5700-53, *Lobbying and Litigation Certificate*, or in a written statement. The Lobbying and Litigation certification and final Financial Status Report shall be submitted within 90 days after the end of project period.

Recipient shall abide by its respective 2 CFR 220, 225, or 230 (formerly OMB Circular A-21, A-87, or A-122), which prohibits the use of federal grant funds for litigation against the United States. Any Part 30 recipient shall abide by its respective 2 CFR 220, or 230 (formerly OMB Circular A-21 or A-122), which prohibits the use of Federal grant funds to participate in various forms of lobbying or other political activities.

10. Pursuant to EPA Order 1000.25 and Executive Order 13101, the recipient agrees to use recycled paper for all reports which are prepared as a part of this agreement and delivered to EPA. This requirement does not apply to Standard Forms. These forms are printed on recycled paper as available through the General Services Administration. Recipient shall comply with the requirements set forth in Section 6002 of the Resource Conservation and Recovery Act (RCRA) (42 U.S.C. 6962). Regulations issued under RCRA Section 6002 apply to any acquisition of an item where the purchase price exceeds \$10,000 or where the quantity of such items acquired in the course of the preceding fiscal year was \$10,000 or more. RCRA Section 6002 requires that preference be given in procurement programs to the purchase of specific products containing recycled materials identified in guidelines developed by EPA. These guidelines are listed in 40 CFR 247.

11. The recipient agrees to ensure that all conference, meeting, convention, or training space funded in whole or in part with Federal funds complies with the protection and control guidelines of the Hotel and Motel Fire Safety Act (PL 101-391, as amended). Recipients may search the Hotel-Motel National Master List at <http://www.usfa.dhs.gov/applications/hotel/> to see if a property is in compliance (FEMA ID is currently not required), or to find other information about the Act.

12. The recipient organization of this EPA assistance agreement must make an ongoing, good faith effort to maintain a drug-free workplace pursuant to the specific requirements set forth in Title 40 CFR 36.200 - 36.230. Additionally, in accordance with these regulations, the recipient organization must identify all known workplaces under its federal awards, and keep this information on file during the performance of the award.

Those recipients who are individuals must comply with the drug-free provisions set forth in Title 40 CFR 36.300.

The consequences for violating this condition are detailed under Title 40 CFR 36.510. Recipients can access the Code of Federal Regulations (CFR) Title 40 Part 36 at http://www.access.gpo.gov/nara/cfr/waisidx_06/40cfr36_06.html.

13. The recipient shall fully comply with Subpart C of 2 CFR Part 180 and 2 CFR Part 1532, entitled "Responsibilities of Participants Regarding Transactions (Doing Business with Other Persons)." The recipient is responsible for ensuring that any lower tier covered transaction as described in Subpart B of 2 CFR Part 180 and 2 CFR Part 1532, entitled "Covered Transactions," includes a term or condition requiring compliance with Subpart C. The recipient is responsible for further requiring the inclusion of a similar term or condition in any subsequent lower tier covered transactions. The recipient acknowledges that failing to disclose the information as required at 2 CFR 180.335 may result in the delay or negation of this assistance agreement, or pursuance of legal remedies, including suspension and debarment.

Recipient may access the Excluded Parties List System at www.epls.gov. This term and condition supersedes EPA Form 5700-49, "Certification Regarding Debarment, Suspension, and Other Responsibility Matters."

14. Additional Federal Funding is contingent upon EPA, Region IX, receiving Federal appropriations for Federal Fiscal Year 2008.

Programmatic Conditions

P1. Progress Reports: The recipient must submit semi-annual progress reports to the EPA project officer, each October and April after the project period is over 1 month old. The purpose of the semi-annual reports is to report on the progress of the project on the tasks and activities agreed upon in the final workplan. At a minimum, these reports should include:

1. A short summary of the accomplishments for the reporting period.
2. Progress on completing individual project tasks.
3. The planned and actual schedules for task completion.
4. Projected accomplishments for the next reporting period.
5. Any problems encountered and their resolution.
6. Data on financial expenditures by budget category. The Financial Status Report must accurately account for all federal funds expended and identify appropriate use of federal funds.
7. Measurement Data (activities, outcomes and impacts), as specified in the approved workplan. See below for more guidance. Recipients are expected to provide quantitative estimates and actual results for outcomes and/or outputs on a semi-annual basis during the grant period

P2. Final Report: A final report is due within 90 days of the end of the grant period. The final report should summarize all activities, accomplishments, financial expenditures and measurement data for the entire grant period and include any deliverables not yet submitted.

P3. Measurement of Project Impact: To the greatest extent possible, the progress and final reports should include measures of the project's effectiveness and impact. This can include changes in attitudes or awareness, changes in behavior, and measured or estimated environmental outcomes. Information on environmental outcomes can be either measured or estimated. These should be reported in terms of pounds of pollution prevented (specify type of pollution), gallons of water saved, BTUs of energy saved, and dollars saved by the target audience (if appropriate).

EPA and the Pollution Prevention Resource Exchange (P2Rx) are developing an on-line system to collect and synthesize pollution measure information. Grant recipients will be expected to enter their project results in that system when it is completed. For more information, see <http://www.p2rx.org/services/measurement.cfm>

P4. Grant Products and Deliverables: All outreach and public education materials (including, but not limited to brochures, press releases, websites, presentation materials) shall clearly state that the project is made possible by cooperative efforts and funding from the U.S. Environmental Protection Agency, Region 9. The recipient must provide the EPA project officer the opportunity to review and approve all materials developed under this award.

P5. Delivery of Reports and Deliverables: One paper and one electronic copy of all final products developed under this grant will be forwarded upon completion to the EPA project officer (see your Grant Agreement/Change Notices for your Project Officer's postal and email addresses). Examples of final products include, but are not limited to: reports, fact sheets, pamphlets, handbooks, model curricula, assessment and audit tools, videos, event brochures, etc. The Grant Project Officer may share final technical reports, and/or final products with the appropriate regional P2Rx center and may send the materials to the Pollution Prevention Information Clearinghouse (PPIC).

All documents will be furnished in at least one of the following electronic versions: PDF, HTML, WordPerfect or MS Word.

P6. Quality Assurance: Quality Assurance Documentation: This grant includes the collection of environmental measurements, or use of environmental information to estimate environmental benefits. As required in the Pollution Prevention Grant RFP, the recipient must provide adequate Quality Assurance (QA) documentation of how environmental information will be generated and used. EPA Region 9 is currently developing a standard format for QA documentation for Pollution Prevention Grants. The recipient will receive this format and instructions by September 2007, and must complete and submit this documentation within 30 days of award of this grant. The QA documentation must be approved by the EPA Project Officer, and the Region 9 Quality Assurance Manager before measurement activities are undertaken. The recipient should contact the EPA Project Officer for assistance.



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
75 Hawthorne Street
San Francisco, CA 94105

MEMORANDUM

February 2, 2009

Karen Holman, Port Project Manager
San Diego Unified Port District
3165 Pacific Highway
San Diego, CA 92101

Ref: Pollution Prevention Grant #NP-00946501

Dear Karen,

This letter is to notify you that Advanced Monitoring has been conducted for your Pollution Prevention Grant #NP-00946501.

Upon review of your workplan, semi-annual progress reports and financial status reports, we have found no issues of concern.

Please review the final report for details of my findings and feel free to contact me if you have any questions

Sincerely,

A handwritten signature in black ink, reading "André Villaseñor".

André Villaseñor
Project Officer
213-244-1813
villasenor.andre@epa.gov

**Advanced Monitoring Report
for
Pollution Prevention Grant NP-00946501
San Diego Unified Port District
Project Officer: André Villaseñor
January 29, 2009**

1. Introduction, Background and Methodolgy

In 2007, the San Diego Unified Port District received a Pollution Prevent grant in the amount of \$190,000 to reduce or eliminate the need for copper coating (which adversely impacts water bodies) on boats in the Shelter Island Yacht Basin in San Diego Bay. The San Diego Unified Port District was created by the state Legislature in 1962 to manage San Diego Bay and surrounding waterfront land. With more than 600 employees and 2007 revenues of \$133.7 million, the agency oversees the protection and development of the Bay.

The grantee is investigating alternative, safer coatings and application methods with the goal of protecting water bodies and human health. Under its grant workplan, the grantee has committed to:

- Assemble Project Workgroup
- Investigate Current Coating Regime
- Investigate Alternative Non-Copper Coatings
- Deliver Test Protocol for Preliminary Tests
- Conduct Preliminary Tests
- Analyze Results of Preliminary Tests and Select Best Coatings
- Develop Test Protocol for Scaled-Up Testing
- Conduct Scaled-Up Tests
- Analyze/Compare Performance and Cost, and Evaluate Cross-Media and Worker Issues
- Prepare Report and Outreach Materials

In January 2008, EPA granted the grantee a no-cost extension to 06/30/2010.

The project officer conducted the review off-site by:

- Reviewing grantee's workplan
- Reviewing grantee's October 2008 progress report, and crosschecking it with workplan
- Reviewing grantee's December 2008 financial status report
- Reviewing the minutes and presentation materials from the grantee's latest (January 21, 2009) stakeholder workgroup meeting and cross-checking it with the grantee's workplan.

2. Results of Review with Recommendations (success and findings)

Tracking of Core Areas Applicable to the Agreement as Defined by EPA Order 5700.6

- a. Ensuring equipment purchased under the award is properly managed and accounted for: grantee has made no equipment purchases under this grant.
- b. Compare the award's workplan/application to actual progress under the award: grantee's progress is on schedule with the workplan and timeline of the workplan.
- c. Examine the award's finances to ensure funds are available to complete the project: to date, grantee has expended \$71,505.
- d. Ensure all programmatic terms and conditions are met:

- P1. Progress Reports: Grantee has submitted their progress reports in accordance with Programmatic Conditions.
 - P2. Final Report: Final report not yet due since project not scheduled for completion until June 2010.
 - P3. Measurement of Project Impact: At this time, grantee cannot measure project impacts since the project is currently in the testing stage of non-copper coatings.
 - P4. Grant Products and Deliverables: All stakeholder meeting minutes, presentations, testing protocols, alt coating cleaning procedures and other information associated with the product are posted on the grantee's website. Presentation materials clearly state that the project is made possible by cooperative efforts of funding from EPA.
 - P5. Delivery of Reports and Deliverables: Grantee has submitted all required reports to project officer on a timely basis.
 - P6. QA: Grantee has submitted relevant QA documentation.
- e. Ensure all programmatic statutory and regulatory requirements are met:
- a. Grantee is currently in compliance with programmatic statutory and regulatory requirements.
- f. Recommendations and Suggestions: Project officer has no recommendations or suggestions for grantee. Grantee is carrying out workplan tasks in a timely and well-organized manner that effectively incorporates stakeholder participation.

Successes

As of the October 2008 semi-annual progress report, grantee accomplished the following:

- Held two stakeholder workgroup meetings;
- Completed the development of the test protocol for the panel testing phase;
- Recruited four boatyards to assist in applying coatings to panels and two marinas to allow slip space to install the panels for the testing phase;
- Applied coatings to the panels;
- Installed panels at two marinas in the Shelter Island Yacht Basin;
- Conducted inspections and cleaning of panels at intervals specified in the panel testing protocol (project office André Villaseñor was present for this activity);
- Initialized analysis of the data and prepared report on the panel testing results.

3. Resolution Plan and Timing

The recipient is fulfilling all of the workplan commitments. The project officer expects the recipient to continue submitting progress reports and financial reports on time, while continuing to fulfill the goals of the workplan.

EPA Grant Agreement NP-00946501-0
Safer Alternatives to Copper Antifouling Paints for Marine Vessels
First Semi-Annual Progress Report

Date: April 28, 2008

Period: October 1, 2007 through April 30, 2008

Project Objectives

The purpose of this project is to find, test and analyze alternatives to copper antifouling paints in the Shelter Island Yacht Basin. The project team will test alternative coatings on panels and on boats. The team will analyze the performance and cost of the alternative coatings and develop outreach materials that will be distributed widely.

1. Summary of Accomplishments

Over the first project period, The Port has:

- Contracted with the Institute for Research and Technical Assistance
- Assembled a workgroup and held two workgroup meetings
- Developed a mission statement and convened a stakeholder group
- Visited six boatyards in San Diego area
- Contacted and received input from alternative coating suppliers
- Began developing test protocol for panel testing

The Port held the first workgroup meeting on February 7. More than 60 interested parties attended the meeting or joined by phone. Attendees included representatives from coating manufacturers, marinas, air and water regulatory agencies, EPA, boatyards, boaters, environmental groups, the Department of Pesticide Regulation and the City and County of San Francisco.

At the first workgroup meeting, The Port and IRTA provided an overview of the project and asked for input from the group on several issues. The Port asked attendees if they would like to join a smaller stakeholder group that would provide more detailed input to the project team. The stakeholder group was assembled for the second workgroup meeting.

The Port and IRTA requested that coating suppliers who would like to have their products tested submit information to IRTA. To date, information on 50 alternative coatings has been received.

The project team contacted other experts to get background information on panel testing so a protocol for panel testing on this project could be designed. The team visited the six San Diego area boatyards and discussed current copper coating application methods, gathered information on the commonly used copper coatings which could serve as baseline coatings in the panel testing, discussed boatyard experience in applying alternative coatings and established boatyard interest in assisting the project team with panel testing. Four boatyards indicated an interest in helping the team apply the coatings to the panels.

The project team held the second workgroup meeting on April 2, 2008. Approximately 50 interested parties attended the meeting or joined the meeting by phone. At this meeting, the stakeholders were acknowledged and asked to commit to the project mission statement. The project team summarized the activities to date, discussed the draft list of test coatings and asked for input from the newly formed stakeholder group and the public on a proposed approach for the panel testing.

2. Progress on Tasks

Task 1: Assemble Project Workgroup and Hold Regular Meetings

As described above in the summary, the project team has held two workgroup meetings and has scheduled a third workgroup meeting for May 5. The team assembled a stakeholder group and will continue to hold additional workgroup meetings throughout the project. The stakeholder group is comprised of:

- Marinas/Yacht Clubs (3 representatives and 3 alternates)
- San Diego Bay Boatyards (2 representatives)
- Environmental Interests (1 representative and 1 alternate)
- Regulatory Agencies (2 representatives and 1 alternate)
- Hull Cleaners (1 representative and 1 alternate)
- Coating Suppliers/Manufacturers (4 representatives)

Task 2: Investigate Current Coating Regime

The project team visited the six boatyards in the San Diego area and talked with several coating suppliers to obtain information on copper coating application and cleaning procedures. This task has been completed.

Task 3: Investigate Alternative Non-Copper Coatings

The project team has begun working on this task. Suppliers have submitted information on 50 coatings for panel testing. The team is working with the suppliers to develop application procedures for all of the coatings and to develop cleaning regimes. This task is still underway.

Task 4: Develop Test Protocol for Preliminary Tests

The project team has initiated this task. The team described a proposed panel testing approach at the workgroup meeting held on April 2 and received input from the stakeholder group and the public. The proposed panel testing approach is being revised and will be finalized before the next workgroup meeting on May 5.

Task 5: Conduct Preliminary Tests

The project team intends to begin applying the baseline and alternative coatings to panels during the week of May 19. The plan is to apply the coatings at four area boatyards with the suppliers present in each case. The panels will be put into the water in June. Planning for the tests is currently underway.

No work has been performed on Tasks 6 through 10 to date.

3. Planned and Actual Schedules

Task 2 was scheduled to be completed by April 1, 2008 and the task has been completed. Task 3 is scheduled to be completed by May 1, 2008 and it will be completed by that date. Task 4 is scheduled to be completed by June 1, 2008 and it will be completed by that date. Task 5 is scheduled to start on June 1, 2008 and the project team should have the panels in the water within the first week of June.

4. Projected Accomplishments for Next Period

During the next period, the project team will hold a workgroup meeting on May 5 to discuss and finalize the protocol for the panel testing. The team will also initiate the panel testing. The panels will be placed in the water beginning in June and will be monitored and cleaned on a regular basis until the end of the testing which is scheduled for October 1, 2008. The team is considering leaving some of the panels in the water for an extended period to collect more information.

5. Problems Encountered

No problems have been encountered during this first reporting period.

6. Financial Expenditures

To date, the Port has not requested federal funds for any of the expenditures identified in the Grant Agreement.

7. Measurement Data

No outcomes have been generated in the project to date. The panel testing will yield information that can be used in the cost analysis and comparison. The coatings that perform well will be applied to boats to further determine their performance and cost.

For outputs, the project team has held two workgroup meetings with a total of 110 attendees. A smaller stakeholder group with 19 members and alternates was convened. Coatings suppliers have provided information on 50 coatings that will be tested.

EPA Grant Agreement NP-00946501-0
Safer Alternatives to Copper Antifouling Paints for Marine Vessels
Second Semi-Annual Progress Report

Date: October 30, 2008

Period: May 1, 2008 through September 30, 2008

Project Objectives

The purpose of this project is to find, test and analyze alternatives to copper antifouling paints in the Shelter Island Yacht Basin. The project team will test alternative coatings on panels and on boats. The team will analyze the performance and cost of the alternative coatings and develop outreach materials that will be widely distributed.

1. Summary of Accomplishments

Since the interim report submitted in April 2008, the Port of San Diego (Port) has completed the following tasks.

- Held two stakeholder workgroup meetings;
- Completed the development of the test protocol for the panel testing phase;
- Recruited four boatyards to assist in applying coatings to panels and two marinas to allow slip space to install the panels for the testing phase;
- Applied coatings to panels;
- Installed panels at two marinas in the Shelter Island Yacht Basin (SIYB);
- Conducted inspections and cleaning of panels at intervals specified in the panel testing protocol
- Initialized analysis of the data and preparing report on the panel testing results

During the previous reporting period, the Port and IRTA developed ideas for a draft protocol for the panel testing phase and presented these ideas to the stakeholder workgroup for the panel testing phase at the second stakeholder workgroup meeting in April 2008. Through collaboration with the workgroup and incorporation of various comments or suggestions, a draft protocol was developed and distributed at the third stakeholder working group meeting on May 5, 2008.

At the meeting on May 5, 2008, approximately thirty-three interested parties were either in attendance at the meeting or joined by phone. Attendees included representatives from

coating manufacturers, marinas, boatyards, boaters, environmental groups, hull cleaners, air and water regulatory agencies such as the Department of Pesticide Regulation (DPR), EPA, and the Regional Water Quality Control Board, and the City and County of San Francisco. Additional comments on the panel testing protocol were received at that time. The final version of the panel testing protocol was released in June 2008 to the workgroup and posted to the Port's website. On October 13, 2008, the Port and IRTA hosted a stakeholder workgroup meeting that focused on obtaining more detailed input from the stakeholder workgroup on the boat test phase of the study. Twenty people were in attendance in person or by phone.

Initially, the coating suppliers expressed interest in submitting as many as fifty alternative coatings. By the submittal deadline of May 19, 2008, only forty-six alternative coatings were received and applied to the fiberglass panels. Four San Diego Bay boatyards agreed to assist the project team in applying the coatings to the fiberglass panels. The project team oversaw and participated in the entire coating application process and completed this task on May 30, 2008.

On June 2 and 3, 2008, the project team installed the panels on floating docks at two marinas in the SIYB who had agreed to participate in the testing. Since that time, the project team inspected and cleaned the panels 13 times according to the schedule specified in the protocol. On October 8, 2008, panel inspection and cleaning assessments were completed.

The project team has begun analyzing the data collected during the inspections/cleanings and has also begun preparing a report on the results. The report will be presented at the fourth stakeholder workgroup meeting on December 10, 2008.

2. Progress on Tasks

Task 1: Assemble Project Workgroup and Hold Regular Meetings

As described above in the summary, the project team held two workgroup meetings during this period. The team presented and discussed the draft protocol for the panel testing to the thirty-three participants at the April meeting. Comments received from the workgroup were incorporated into the panel testing protocol as deemed appropriate by the project team. The October meeting, attended by twenty people, focused on obtaining stakeholder on the boat test phase of the study.

Task 3: Investigate Alternative Non-Copper Coatings

The project team researched to identify the alternative coatings that were available or being developed and solicited information on alternative coatings from various suppliers. Initially, information on fifty coatings was submitted to the project team. The project team worked with all of the suppliers to develop agreed upon application procedures and cleaning regimes for each of the alternative coatings. This task has been completed.

Task 4: Develop Test Protocol for Preliminary Tests

The panel testing protocol specified the type of material and dimensions of the panels for testing, the description of the frames that were used to hold the panels and the methods of attaching the panels to the floating docks at the marinas/yacht clubs. Assessment of the test coatings involved conducting regular inspections of the test coatings and performing specified cleaning regimes for all of the alternative and baseline copper coatings, as well as the gel coat only and blank panels. The protocol for the panel testing was completed during this period.

Task 5: Conduct Preliminary Tests

The project team worked with the boatyards the last two weeks of May to apply all the coatings to the panels. Most of the suppliers were present during the application and many applied their own coatings. Suppliers provided 46 alternative coatings for the testing. Two copper coatings, one a low copper content coating and the other a high copper content coating, were also provided by the suppliers to act as baseline coatings. The alternative test coatings were classified into three categories: zinc coatings; non-zinc organic biocide coatings; and non-biocide coatings. Eighteen zinc coatings, four non-zinc biocide coatings and 24 non-biocide coatings were each applied to a series of three panels. Each panel series painted with the same coating was then attached to a single frame.

The panels/frames were placed in the water and attached to floating docks June 2 and 3, 2008 at two marinas in SIYB. The inspections and cleanings were conducted by the project team from June through early October 2008. Within each panel series, one panel served as the control for each coating and was not cleaned at all during the testing phase. A second panel was cleaned with soft carpet every three weeks to mimic a schedule many hull cleaners use for cleaning boat hulls during the summer time period, while the third panel was cleaned according to the suppliers' instructions.

This task was completed during this reporting period.

Task 6: Analyze Results of Preliminary Tests and Select Best Coatings

This task has been initiated by the project team. The team has begun to analyze the results of the panel testing and will prepare a report that will be distributed to the stakeholder group prior to the meeting on December 10, 2008.

Task 7: Develop Test Protocol for Scaled-Up Testing

The project team has just initiated this task. The team is identifying various sources of boats to be assessed during the scaled-up testing. A number of boat owners willing to participate in the coating tests for boats have expressed their interest to the project team. The team has also begun the development of the protocol for the boat testing phase.

3. Planned and Actual Schedules

Task 3 was scheduled to be completed by May 1, 2008 and it was completed by that date.

Task 4 was scheduled to be completed by June 1, 2008 and it was completed by that date.

Task 5 was scheduled to be completed by October 1, 2008 and was completed on October 8, 2008.

Task 6 is scheduled to be completed by January 1, 2009 and Task 7 is scheduled to be completed by March 1, 2009.

4. Projected Accomplishments for Next Period

During the next period, the project team will continue holding stakeholder workgroup meetings. The project team will present and discuss the results of the panel testing and will discuss which coatings are being selected to move forward to the boat testing phase of the project. The project team will also finalize the protocol for the boat testing phase and will begin the boat testing evaluations.

5. Problems Encountered

No problems have been encountered during the second reporting period.

6. Financial Expenditures

Table 1 identifies the expenses that have occurred for this project to date. This table is consistent with the budget categories identified in the Grant Agreement.

Table 1 – Project Expenditures from January 1, 2008 – September 30, 2008

Budget Category	Project Expenses (Jan 1 – Sept 30, 2008)	Approved Project Budget
Personnel	\$36,366.55	\$80,961
Fringe Benefits	23,820.09	\$40,072
Travel	\$2,303.00	\$11,895
Supplies	\$3,799.89	\$3,799.89
Contractual	\$71,505.00	\$231,825
Construction	\$0	\$0
Other	\$0	\$0
Total	\$137,794.53	\$380,033

It should also be noted that the Port has expended an additional \$25,014.50 on services not allotted within the grant agreement budget categories, yet essential for successful implementation of this agreement.

7. Measurement Data

No outcomes have been generated in the project to date. When the project team completes analysis of the panel testing assessment, coatings moving through to the next testing phase will be identified.

For outputs during this period, the project team held two workgroup meetings; attendance at these meetings totaled fifty-three attendees. Coating suppliers provided information on and samples of 46 alternative coatings and two copper baseline coatings. Fifty-seven frames holding 171 total panels were tested, inspected and cleaned according to the protocol during this reporting period.

EPA Grant Agreement NP-00946501-0
Safer Alternatives to Copper Antifouling Paints for Marine Vessels
Third Semi-Annual Progress Report

Date: April 10, 2009

Period: October 1, 2008, through March 31, 2009

Project Objectives

The purpose of this project is to identify, test and analyze alternatives to copper antifouling paints in the Shelter Island Yacht Basin. The project team will test alternative coatings on panels and on boats. The team will analyze the performance and cost of the alternative coatings and develop outreach materials that will be widely distributed.

1. Summary of Accomplishments

Since the interim report submitted in October 2008, the Port of San Diego (Port) has completed the following tasks:

- Held two stakeholder workgroup meetings;
- Completed analysis of the panel testing results;
- Identified 21 top performing paints in the panel testing and developed protocol to apply paints to boats. Selected 10 coatings to test on boat hulls;
- Recruited four boatyards to assist in applying coatings to boats;
- Recruited boat owners willing to have selected top performing paints applied to their boats and developed written agreements to ensure participation guidelines are met;
- Recruited local divers to assist in inspection and cleaning of the test boats;
- Developed protocol for underwater assessment and hull cleaning for the test coatings;
- Boat hull painting has commenced.

During the previous reporting period, the Port and Institute for Research and Technical Assistance (IRTA) completed the panel testing of 46 alternative paints

which were provided by various coating suppliers. During this period, the project team analyzed the results of the panel testing. The results of the panel testing were presented to the stakeholder workgroup at a meeting on December 10, 2008 and the team asked for input on the procedures for moving on to the boat testing phase.

At the December 10 meeting, approximately 44 interested parties were either in attendance at the meeting or joined by phone. The project team received substantial input from the workgroup members on a design for the boat testing phase. On January 21, another workgroup meeting was held to discuss the team's proposed approach to the boat testing phase and to solicit input from the workgroup members. At this meeting, approximately 36 interested parties either attended or joined by phone. Attendees for both meetings included representatives from coating manufacturers, marinas, boatyards, boaters, environmental groups, hull cleaners and regulatory agencies such as the Department of Pesticide Regulation (DPR) and the Regional Water Quality Control Board.

With input from the workgroup members, the project team decided to prioritize the paints to be tested on boat hulls. The highest priority was given to the top performing non-biocide paints. The project team developed a tiered approach to ensure the top performing non-biocide paints were included in the next phase regardless of the number of available boats. Through this tiered approach, 10 of the 21 top performing coatings were chosen to be applied to boats. Six of the coatings are non-biocide coatings. Three of the coatings are biocide coatings containing either zinc and/or organic biocide active ingredients. The remaining coating contains zinc oxide only, but no active ingredients. Only one coating will be applied to each boat.

The project team visited boatyards to inquire about their assistance in applying the coatings to boats. Four of the boatyards agreed to participate in the study. The project team also met with boat owners to discuss their participation in the study and answer any questions regarding the application of the alternative paints, which would occur during a routine haul out. In addition, the team met with the divers several times to solicit input on a hull cleaning protocol and one diver was recruited to inspect and test all the boats in the boat testing phase.

Currently, paints are being applied to volunteer boats. It is anticipated that the painting should be completed in early May, enabling assessment to commence on schedule.

2. Progress on Tasks

Task 1: Assemble Project Workgroup and Hold Regular Meetings

As described above in the summary, the project team held two workgroup meetings during this period. The team presented and discussed the results of the panel testing at the first meeting and solicited input for developing the boat testing phase. At the second meeting, the team presented an approach for testing the top performing paints on boat hulls and received additional comments from the workgroup. The project team met with boat owners interested in participating in the project on February 9, 2009. The project team discussed the study and the role the boat owner would play in the study to twelve interested parties in attendance and answered questions. In addition, the project team met with five local hull cleaners on February 2, 2009 to discuss the test protocol for scaled-up testing and the role of hull cleaners in the boat hull testing phase.

Task 6: Analyze Results of Preliminary Tests and Select Best Coatings

This task has been completed by the project team. In the panel testing, almost all of the alternative biocide paints performed well and required very little cleaning. Two types of non-biocide paints were tested on panels. The “hard” paints containing epoxy and/or ceramic were very difficult to clean whereas the “soft” paints, generally containing silicon compounds, were easier to clean. Five of the soft paints and the best performing hard non-biocide paints were selected to be put on boats for the one paint/one boat test.

Task 7: Develop Test Protocol for Scaled-Up Testing

The project team has completed many of the components of this task. Based on input from the stakeholder workgroup, the team decided to apply 10 coatings to boat hulls. If more than 10 boats are available, the non-biocide paints that performed well in the panel testing phase will be applied as duplicates to the additional boat hulls. The project team worked with the suppliers to determine the best methods of applying their paints, recruited four boatyards willing to assist in applying the paints, recruited boaters willing to paint their boats with test paints and recruited a diver to assist the team in inspecting and cleaning the boat hulls regularly. The project team is currently accepting comments on the field testing protocol for the inspection and assessment of the test coatings on boat hulls. This field testing protocol is anticipated to be finalized by the end of April.

Task 8: Conduct Scaled-Up Tests

The project team has started applying the selected test paints to boat hulls. It is anticipated that all but one of the boats should be painted by early May. The remaining boat is anticipated to be painted by early June.

3. Planned and Actual Schedules

Task 6 was scheduled to be completed by January 1, 2009, and was completed in the middle of January. Task 7 was scheduled to be completed by March 1, 2009, and many components were completed by the end of March. The remaining element, the field testing protocol is anticipated to be final by April 30. Task 8 is scheduled to be completed by October 1, 2009.

4. Projected Accomplishments for Next Period

During the next period, the project team will hold a workgroup meeting to present the status of the boat paint applications. The team will finish applying the 10 selected paints to the boats. Underwater hull assessment and cleaning will occur regularly on a three week interval. The three-week inspections/cleanings of the boat hulls will be initiated with the project diver. The boats will be monitored regularly during the next six months.

5. Problems Encountered

No problems have been encountered during the third reporting period.

6. Financial Expenditures

Table 1 identifies the expenses that have occurred for this project to date. This table is consistent with the budget categories identified in the Grant Agreement.

Table 1 – Project Expenditures from October 1, 2008 – March 31, 2009

Budget Category	Project Expenses (Oct 1, 2008 – Mar 31, 2009)	Approved Project Budget
Personnel	\$25,969	\$80,961
Fringe Benefits	\$17,009	\$49,072
Travel	\$726	\$14,165
Supplies	\$0	\$4,010
Contractual	\$36,966	\$231,825
Construction	\$0	\$0
Other	\$0	\$0
Total	\$80,670	\$380,033

It should also be noted that during this period, the Port has expended an additional \$5,354.49 on services not allotted within the grant agreement budget categories, yet essential for successful implementation of this agreement.

7. Measurement Data

One outcome generated during this period was the identification of the 21 top performing paints from the panel testing phase. Another outcome was the selection of a subset of the top performing paints to use for the boat testing phase. Of these, all six of the top performing non-biocides, three active biocide paints and one zinc-based non-biocide were included.

For outputs during this period, the project team held two workgroup meetings with 80 attendees. The results of the panel tests were finalized and tables identifying the top performing paints were developed. Formal agreements were also developed between the Port and boaters during this period. These agreements memorialized the boater's participation responsibilities and identified cost-sharing elements. Agreements were also developed between the Port and boatyards and the Port selected hull cleaners to bring these parties formally into this project.

EPA Grant Agreement NP-00946501-2
Safer Alternatives to Copper Antifouling Paints for Marine Vessels
Semi-Annual Progress Report

Date: October 30, 2009

Period: April 1, 2009 through September 30, 2009

Project Objectives

The purpose of this project is to find, test and analyze alternatives to copper antifouling paints in the Shelter Island Yacht Basin. The project team will test alternative coatings on panels and on boats. The team will analyze the performance and cost of the alternative coatings and develop outreach materials that will be distributed widely.

1. Summary of Accomplishments

Since the interim report submitted in April 2009, the project team has completed the following tasks:

- Held one workgroup meeting.
- Worked with four boatyards to apply paints to boats.
- Applied alternative paints to test boats.
- Completed field inspection forms for documenting visual observations and cleaning efforts.
- Developed and distributed boater tracking logs and a boater information packet to all boater volunteers.
- Conducted regular three-week inspections of boats and cleaned boat hulls when necessary.
- Conducted enhanced inspections and cleaning for two test boats that were determined to need more frequent cleaning.
- Held a hull cleaner Quality Assurance field coordination effort to compare project-related field efforts to industry standards.
- Provided project updates to the stakeholders and the general public on the Port's website.
- Provided educational information about this project and alternative hull paints at two events during the period.

During this period, the project team held one workgroup meeting to discuss and finalize the boat painting protocol. There were 34 representatives attending the meeting either in

person or by phone. These attendees provided input on both the protocol and the paint application and hull cleaning processes.

The hull testing protocol was finalized during this reporting period. The final hull testing protocol included a rating system for fouling growth and cleaning efforts and a description of the QA efforts that will be employed for this project. Field forms were also included in the final testing protocol.

During this period, the Port recruited additional boaters and painted nine more test boats. There are currently eleven boats in the project. Three of the boats have biocide coatings, two of the boats have zinc oxide only paint and six of the boats have non-biocide coatings. Two of the six non-biocide coatings are duplicates. As the boats were painted, they were included in the regular three-week inspection and cleaning schedule. Two of the boats required more frequent cleaning and they have been placed on a two-week inspection and cleaning schedule.

As part of the QA for this project, the project team identified the need for a periodic peer review on the hull cleaning process. This was identified in the final hull testing protocol. The primary objective for this QA step was to obtain an objective hull cleaning in-water perspective on the rating scales we are using for assessing fouling growth, coating condition, and cleaning effort. This peer review was designed to ensure this project conducts cleaning consistent with industry standard practices and that the fouling/coating condition ratings are consistent and can be replicated. On July 14, 2009, the project team invited non-project hull cleaners to conduct a QA check on the project's inspection and cleaning process. Four non-project hull cleaners participated. Their findings indicated that hull cleaning practices are consistent with industry standards. The QA process also evaluated the cleaning ratings and determined that project hull cleaners were accurate in rating cleaning efforts.

During this period, the project team provided educational information about alternative hull paints and this grant project to interested parties. On June 27, project team staff participated in the California Yacht Marina Member Appreciation Day (Chula Vista, CA). During this event, staff met with boaters and discussed the grant project and answered questions about hull paints. On July 9, the project team gave an update to the Interagency Coordinating Committee Antifouling Strategy Workgroup. The update included progress on this grant project and the inspection/cleaning process used to assess the paints. Twenty-seven people participated in this meeting. -

2. Progress on Tasks

Task 1: Assemble Project Workgroup and Hold Regular Meetings

As described above in the summary, the project team held one workgroup meeting during this period. Approximately 34 interested parties were either in attendance at the meeting or joined by phone. Attendees included representatives from coating manufacturers, marinas, boatyards, boaters, environmental groups, hull cleaners and regulatory agencies.

The team discussed the boat painting phase and presented, and finalized the hull testing protocol.

Task 7: Develop Test Protocol for Scaled-Up Testing

The project team used input from the stakeholder workgroup to finalize the hull testing protocol during April. The protocol identified how each coating's performance would be evaluated, including the process for assessing the amount of fouling present at each inspection, the coating condition and the level of effort required to clean the hull. The final protocol included application procedures, an overview of the inspection process, rating scales for evaluating the coatings, QA procedures, and field forms for documenting information.

Two forms were developed, one designed for underwater use and recording specific hull conditions and the other for complete tracking of each field effort. These forms captured general observations during inspection efforts, assessments of fouling, and assessments of cleaning and coating condition. The protocol was posted on the Port's website and was distributed to the stakeholder workgroup via email. This occurred in June 2009.

Task 8: Conduct Scaled-Up Tests

Several test boats were painted during the period. The project team coordinated with the boatyards to paint the test boats in April and most were completed by June. There are currently 11 boats in San Diego Bay that have been painted with alternative coatings. The project team worked with the coating suppliers to determine the best methods of applying their paints and worked with boatyards to apply the paints according to manufacturer's instructions.

The project team began inspecting and cleaning the boats on a three-week schedule as specified in the protocol. In general, the boats are inspected and the hulls are cleaned only if cleaning is required. The team is working with one hull cleaning company which handles all of the boats. Consistent with the hull testing protocol, the least aggressive cleaning method is used if a boat requires cleaning. More aggressive tools are only used if necessary to remove the fouling.

Coatings on two of the test boats appeared to require more frequent cleaning based on early inspection findings. Midway through the summer, the project team elected to increase the inspection and cleaning frequency of these boats to a two-week frequency. This appears adequate to keep fouling growth under control.

3. Planned and Actual Schedules

Task 1 is ongoing throughout the project and is occurring on regular intervals. Task 7 was scheduled to be completed by March 1, 2009, and many components were completed by the end of March. The remaining element, the field testing protocol was finalized in

April, 2009. Task 8 was originally scheduled to be completed by October 1, 2009; but with the approved grant extension for additional time, this task is anticipated to be completed in December, 2010.

4. Projected Accomplishments for Next Period

During the next period, the project team plans to continue the boat testing phase. Additional peer review efforts may be schedule to evaluate data and program consistency. The team will also initiate Task 9 “Analyze/Compare Performance and Cost and Evaluate Cross-Media and Worker Issues.”

5. Problems Encountered

Two of the alternative test coatings have been eliminated from the hull testing due to performance issues. These coatings failed to meet performance standards for fouling and coating conditions. Because this project is designed to test alternative hull coating for “real-world” use, performance issues such as these are expected outcomes. Furthermore, removal of ineffective coatings during the study period ensures that only viable options are presented in the final report.

6. Financial Expenditures

Table 1 identifies the expenses that have occurred for this project to date. This table is consistent with the budget categories identified in the Grant Agreement.

Table 1 – Project Expenditures from April 1, 2009 – September 30, 2009

Budget Category	Project Expenses (April 1, 2009 – Sept 30, 2009)	Approved Project Budget
Personnel	\$25,283.94	\$80,961
Fringe Benefits	\$15,835.00	\$49,072
Travel	\$2,666	\$14,165
Supplies	\$0	\$4,010
Contractual	\$39,455	\$231,825
Construction	\$0	\$0
Other	\$0	\$0
Total	\$85,099	\$380,033

It should also be noted that during this period, the Port has expended an additional \$27,633 on services not allotted within the grant agreement budget categories, yet essential for successful implementation of this agreement.

7. Measurement Data

One of the outcomes generated during this period was that nine boats were painted with alternative coatings and one boat was repainted with another coating. Another outcome was the finding that the project's inspection and hull cleaning activities are being conducted in a manner consistent with industry standards. This was determined through the use of a coordinated QA peer review that occurred during a routine hull inspection/cleaning effort.

For outputs during this period, the project team held one workgroup meeting with 34 attendees. The hull testing protocol was finalized and distributed to the workgroup via email and also posted on the Port's website. Two field forms were completed as a part of the hull testing protocol. Information packets were distributed to each project boater. These packets included a summary of the project and its anticipated outcomes, brief information about the test coating, and a log to track vessel use. The project team also held on QA field coordination meeting with four hull cleaners in attendance.

EPA Grant Agreement NP-00946501-4
Safer Alternatives to Copper Antifouling Paints for Marine Vessels
Semi-Annual Progress Report

Date: April 30, 2010

Period: October 1, 2009 through March 31, 2010

Project Objectives

The purpose of this project is to find, test and analyze alternatives to copper antifouling paints in the Shelter Island Yacht Basin. The project team will test alternative coatings on panels and on boats. The team will analyze the performance and cost of the alternative coatings and develop outreach materials that will be distributed widely.

1. Summary of Accomplishments

Since the progress report submitted in October 2009, the project team has completed the following tasks:

- Applied an alternative paint to one new test boat.
- Conducted regular three-week inspections of boats and cleaned boat hulls when necessary.
- Conducted enhanced inspections and cleaning for two test boats that were determined to need a more frequent cleaning frequency.
- Provided project updates to suppliers of coatings on boats about paint performance.
- Provided project updates to the stakeholders and the general public on the Port's website.
- Provided outreach about the EPA project and alternative coatings at two events during this time period.

During this period, the project team arranged for a non-biocide alternative paint to be applied to one test boat. The boat was then included in the regular three-week inspection and cleaning schedule.

There are twelve boats are now included in the project. Three of the boats have biocide coatings, two of the boats have zinc-oxide paint and seven of the boats have non-biocide coatings. Two of the seven non-biocide coatings are duplicates. Of the twelve boats, two required more frequent cleaning and as such, were placed on a two-week inspection and

cleaning schedule during the last period. During this period, the two-week inspections were continued and, more recently, the boats were put back on the three-week schedule.

During the period, the project team updated the coating suppliers on the performance of their coatings on the boats. In addition, when enhanced cleaning of the boat was necessary, the project team contacted the supplier and discussed the types of tools that could be used to clean the fouling from the boats. In all cases, the team received permission before cleaning with a more aggressive tool.

During the period, the project team provided educational information about alternative hull paints and the EPA grant project to interested parties. The project team continued to participate in the state-wide IACC Marinas and Recreational Boating and Antifouling Strategy Workgroup, led by the Department of Pesticide Regulation (DPR), to increase overall understanding of copper impacts statewide. The project team provided an update to the workgroup on the EPA grant project at the April 8, 2010 meeting.

2. Progress on Tasks

Task 8: Conduct Scaled-Up Tests

A new test boat was added to the program and was painted during the period. This boat was included to be a duplicate of an existing test coating for comparability purposes. The project team coordinated with the boatyard and the supplier to apply the paint according to the manufacturer's instructions. The painting was completed in December. There are currently 12 boats in San Diego Bay that were painted with alternative coatings.

The bulk of the work during this reporting period was a continuation of the efforts to conduct the scaled-up (boat hull) testing. During the period, the project team continued inspecting and cleaning the boats on a three-week schedule as specified in the protocol. Two of the boats were started on a two-week schedule during the previous period and this schedule was continued for part of the current period. The two boats were put back on the three-week inspection and cleaning schedule in February, after it was determined that fouling had decreased and the coating could withstand a longer cleaning duration.

In general, the boats are inspected and the hulls are cleaned only if cleaning is required. The team is working with one hull cleaning company which handles all of the boats. Consistent with the hull testing protocol, the least aggressive cleaning method is used if a boat requires cleaning. More aggressive tools are only used if necessary to remove the fouling. The project team is careful to contact the supplier to discuss the cleaning when it is observed that a more aggressive cleaning tool is required.

3. Planned and Actual Schedules

Task 1 (Assemble Project Workgroup/Hold Meetings) is ongoing throughout the project and is occurring at regular intervals as appropriate. During this report period, the Port requested, and received a time extension extending the project through January 2011.

This will enable a more complete assessment of the alternative test coatings that is consistent with the life expectancies for copper coatings. Task 8 (Conduct Scaled-up Tests) was originally scheduled to be completed by October 1, 2009. It now will be extended through December 2010 to fully assess the test coatings. The information for the cost evaluation (Task 9) and development of outreach materials (Task 10) are anticipated to start in the upcoming months and continue through the extended duration of the project.

4. Projected Accomplishments for Next Period

During the next period, the project team plans to continue the boat testing phase. A notice for a workgroup meeting has been sent out to the stakeholders and the meeting will be held on May 6. The team will shortly initiate Task 9 (Analyze/Compare Performance and Cost and Evaluate Cross-Media and Worker Issues). During the next period, the team will begin drafting an outline for the final report and will initiate Task 10 (Prepare Report and Outreach Materials).

5. Problems Encountered

No problems have been encountered during this period. The approved time extension through January, 2011 will enable a full evaluation of the alternative coatings that is consistent with the life expectancy of the traditional copper coatings.

6. Financial Expenditures

The project team is continuing to effectively utilize grant funding and is progressing on schedule for grant expenditures. It should be noted that the Port has fulfilled its grant match in terms of both the cash match and the in-kind staffing. Table 1 identifies the expenses that have been billed to the project. The table is consistent with the budget categories identified in the Grant Agreement. The Grant funding is anticipated to be sufficient to continue the work through the approved time extension.

Table 1 – Project Expenditures from October 1, 2009 – March 31, 2010

Budget Category	Project Expenses (October 1, 2009 – March 31, 2010)	Approved Project Budget
Personnel	\$11,849	\$80,961
Fringe Benefits	\$9,124	\$49,072
Travel	\$1,817	\$14,165
Supplies	\$0	\$4,010
Contractual	\$27,695	\$231,825
Construction	\$0	\$0
Other	\$0	\$0
Total	\$50,485	\$380,033

It should also be noted that during the period, the Port has expended an additional \$24,458 on services not allotted within the grant agreement budget categories. These services, consisting of expenses for hull cleaning of the test boats, painting the boats, and underwater evaluations, are essential for successful implementation of the agreement.

7. Measurement Data

One of the outcomes generated during this period was that one additional boat was painted with an alternative coating.

Several outputs related to education and outreach occurred during the reporting period. Each educational effort provides the chance to encourage boaters or hull cleaners to switch to safer alternatives, the ultimate goal of this grant project.

The project team provided outreach at two events during the period. Information was provided at the Sunroad Boat Show on January 28-31, 2010. Outreach was also provided at the Day at the Docks event on April 18, 2010. Attendance for each event was estimated to be over 10,000 people.

The project team met with the Port's General Services dive team staff on March 3, 2010, to provide information on alternative hull paints, associated maintenance strategies, and the Port fleet's boat hull paint conversion efforts. This effort is enabling Port staff to become more familiar with non-copper hull paints and proper cleaning methodology.

On February 22, 2010, the project team contacted the seven coating suppliers participating in the boat hull testing to provide updates of how their coating(s) were performing. These informal conversations help to improve the understanding of the test program and provide valuable input to the suppliers on the real-world maintenance efforts necessary for their coating(s).

**EPA Grant Agreement NP-00946501-4
Safer Alternatives to Copper Antifouling Paints for Marine Vessels
Semi-Annual Progress Report**

Date: October 31, 2010

Period: May 1, 2010 through October 31, 2010

Project Objectives

The purpose of this project is to find, test and analyze alternatives to copper antifouling paints in the Shelter Island Yacht Basin. The project team will test alternative coatings on panels and on boats. The team will analyze the performance and cost of the alternative coatings and develop outreach materials that will be distributed widely.

1. Summary of Accomplishments

Since the progress report submitted in April 2010, the project team has completed the following tasks:

- Held one workgroup meeting
- Conducted regular three-week inspections of boats and cleaned boat hulls when necessary.
- Conducted enhanced inspections and cleaning for two test boats that were determined to need more frequent cleaning frequency.
- Distributed a draft and final annotated outline for the final report.
- Provided project updates to the stakeholders and the general public on the Port's website.

For the last period, twelve boats were included in the project. Three of the boats have biocide coatings, two of the boats have zinc oxide only paint and seven of the boats have non-biocide coatings. Three of the seven non-biocide coatings are duplicates. Two of the twelve boats required more frequent cleaning. During the last period, they had been placed on a two-week inspection and cleaning schedule. During this period, the two-week inspections were continued. In September 2010, both boats returned to the three-week schedule.

Additionally, when enhanced cleaning of the boat was necessary, the project team contacted the coating supplier and discussed the types of tools that could be used to clean the fouling from the boats. In all cases, the team received permission before cleaning

with a more aggressive tool. One coating supplier joined the divers to inspect the two boats that were painted with his test coating.

During the period, the project team provided educational information about alternative hull paints and the EPA grant project to interested parties. The project team continued to participate in the state-wide IACC Marinas and Recreational Boating and Antifouling Strategy Workgroup, led by the Department of Pesticide Regulation (DPR), to increase overall understanding of copper impacts statewide. The project team provided an update to the workgroup on the EPA grant project at the August 11, 2010 meeting. At this meeting, the project team discussed the timing of the final report and provided the annotated outline to the group, enabling them to comment on the structure of the report prior to it being drafted. An educational flyer about alternative hull paints and the EPA grant project was also distributed at two outreach events: 1) the Festival of Sail San Diego on September 2-6, 2010, which had an estimated 10,000 people in attendance, and 2) Chula Vista Harbor Days Festival on October 9-10, 2010, with 200 people estimated in attendance.

2. Progress on Tasks

Task 1: Assemble Work Group

Over the period, the project team held one work group meeting on May 6. There were 29 participants in attendance and 12 participants via conference call. These included paint suppliers, boatyard representatives, divers, boaters, government agency representatives and environmental group representatives. The purpose of the meeting was to update the work group and interested parties on the boat hull testing program and to describe the approach to the analysis or the results of the boat testing.

Task 8: Conduct Scaled-Up Tests

During the period, the project team continued inspecting and cleaning the boats on a three-week schedule as specified in the protocol. Two of the boats continued on a two-week schedule for part of the current period. The two boats were put back on the three-week inspection and cleaning schedule in September 2010.

In general, the boats are inspected and the hulls are cleaned only if cleaning is required. The team has continued to work with the same hull cleaning company which has handled all of the boats. Consistent with the hull testing protocol, the least aggressive cleaning method is used if a boat requires cleaning. More aggressive tools are only used if necessary to remove the fouling. The project team is careful to contact the supplier to discuss the cleaning when it is observed that a more aggressive cleaning tool is required.

Task 9: Analyze/Compare Performance and Cost and Evaluate Cross-Media and Worker Issues

The project team began analyzing the results of the boat testing during the period. The results will be used in the report to determine the performance and cost of the alternative paints.

Task 10: Prepare Report and Outreach Materials

The project team developed an annotated outline for the final project report. The draft outline was distributed to the work group members and placed on the Port website. The comments that were received were incorporated into the outline and the final outline was distributed to stakeholders. A copy of the annotated outline is attached to this progress report. The project team is currently completing the analysis of the boat testing and preparing a draft of the final project report.

3. Planned and Actual Schedules

Task 1 is ongoing throughout the project and is occurring at regular intervals as appropriate. The project team is planning to have a final work group meeting in November to discuss the draft report. Task 8 was originally scheduled to be completed by October 1, 2009. The Port received a grant extension for additional time for the project and Task 8 should be completed by December 2010. Task 9 was initiated in September as planned.

The draft project report is scheduled to be distributed for work group member comments in early November. The comments will be incorporated and the final report will be sent to EPA in January, 2011.

4. Projected Accomplishments for Next Period

Over the next, and final period, the project team plans to complete the boat testing phase. The team will complete Task 9 “Analyze/Compare Performance and Cost and Evaluate Cross-Media and Worker Issues.” A draft report will be made available to the stakeholder workgroup for comments. The comments will be reviewed by the project team and considered for incorporation into the final report. Education and outreach materials presenting the final outcomes of the project will be developed and distribution of the print materials will begin. The information will also be made available on the Port’s website.

5. Problems Encountered

No problems have been encountered during this period.

6. Financial Expenditures

Table 1 identifies the expenses incurred by the project, to date. The table is consistent with the budget categories identified in the Grant Agreement.

Table 1 – Project Expenditures from April 1, 2010 – September 30, 2010

Budget Category	Project Expenses (April 1, 2010 – September 30, 2010)	Approved Project Budget
Personnel	\$13,531	\$80,961
Fringe Benefits	\$11,574	\$49,072
Travel	\$1,440	\$14,165
Supplies	\$0	\$4,010
Contractual	\$35,635	\$231,825
Construction	\$0	\$0
Other	\$0	\$0
Total	\$62,180	\$380,033

It should also be noted that during the period, the Port has expended an additional \$2,975 on services not allotted within the grant agreement budget categories. These services, consisting of expenses for hull cleaning of the test boats, painting the boats, and underwater evaluations, are essential for successful implementation of the agreement.

7. Measurement Data

Outputs related to education and outreach occurred during the reporting period. Each educational effort provides the chance to encourage boaters or hull cleaners to switch to safer alternatives, the ultimate goal of this grant project. One work group meeting was held during this period, on May 6, 2010. The purpose of the meeting was to update the work group and interested parties on the boat hull testing program and to describe the approach to the analysis or the results of the boat testing. The draft and final annotated outlines of the project report were discussed and distributed opening a comment period for the annotated outline.

Additionally, the project team provided outreach at three events during the period. The project team provided an update to the state-wide IACC Marinas and Recreational Boating and Antifouling Strategy Workgroup, at their August 11, 2010 meeting. This update discussed the timing of the final report and provided the annotated outline to the group, enabling them to comment on the structure of the report prior to it being drafted. An educational flyer about alternative hull paints and the EPA grant project was also distributed at two events. The Festival of Sail San Diego was held on September 2-6, 2010, and attendance for this event was estimated to be over 10,000 people, and 2) Chula Vista Harbor Days Festival on October 9-10, 2010, and attendance for this event was estimated to be over 200 people. In addition, one coating supplier joined the divers on June 22, 2010 to inspect the two boats that were painted with his test coating.

In addition, the project team met with the Port's General Services dive team staff on August 3, 2010, to provide an update on the EPA grant project as well as provide more information on alternative hull paints and associated maintenance strategies. The project team also discussed the conversion and testing efforts in other ports in California, and the continuing Port fleet's boat hull paint conversion efforts. This effort is enabling Port staff to become more familiar with non-copper hull paints, the proper cleaning methodologies, and what other ports are doing to transition their fleets.

San Diego Bay

COPPER REDUCTION *program*



Did you know that your boat's hull paint could be affecting the water in San Diego Bay?



Copper, a common component used in hull paints, has been found at high levels in San Diego Bay and has a negative impact on marine life.

Learn more about what you can do as a boater to enhance your boats performance and develop hull paint maintenance strategies that protect the environment.

COPPER REDUCTION PROGRAM

What is the purpose of adding copper to hull paint?

Boat bottom paint is a crucial component in successfully maintaining and increasing the longevity of your boat.

The purpose of hull painting is to improve the boat's performance by keeping the hull free of marine organisms and algae. Over time, organisms can attach themselves to the hull bottom, decreasing speed and handling.

Antifouling paints work by delivering a controlled, steady release of biocide from the paint surface into the layer of water next to the hull. It is this layer of biocide that helps prevent the fouling from settling. To date, copper has been the most common biocide used in hull paints.

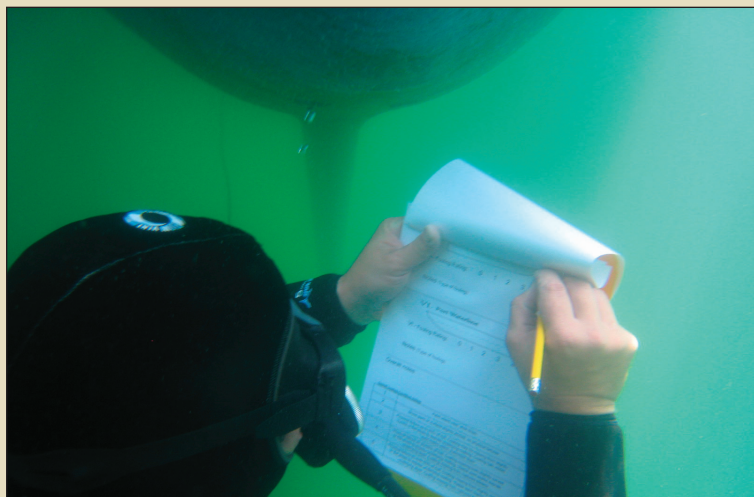
Why are copper based paints a problem?

Water quality impacts from copper-based hull paints are being identified in many marinas in California. Concern over the toxic buildup of copper in areas such as marina basins in San Diego Bay has led to efforts to reduce input of copper from hull paint to ensure the protection of marine life.

In fact, eight marina basins in San Diego Bay have been determined to exceed state and federal standards for copper that were established to protect marine life. Within the Shelter Island Yacht Basin (SIYB), regulations are in place requiring the reduction of copper pollution. The primary sources of copper pollution in the SIYB have been identified to be:

- the passive leaching from copper-based hull paints;
- underwater hull cleaning of boats having copper hull paints.

Since much of the copper pollution is attributed to copper-based hull paints, substitution to alternative coatings could reduce copper pollution significantly. Complying with the regulations will involve using a combination of non-copper alternatives and related hull cleaning maintenance strategies.



A diver takes notes to help the Port evaluate a variety of non-copper alternative paints through panel and boat hull testing.



Transitioning to alternative boat hull paints will play an important role in reducing copper pollution in San Diego Bay.

How is the Port of San Diego learning about performance and economics of non-copper based paints?

The Port of San Diego is taking an active role in identifying and assessing alternative boat paints as replacements for copper hull paints. Recently, the Port's Board of Port Commissioners have demonstrated their commitment by adopting a resolution declaring their commitment to take actions to reduce copper concentrations in San Diego Bay by developing policies and programs to achieve reductions and to identify viable options to reduce copper levels in San Diego Bay.

Ongoing efforts include field testing of paints on panels and boats to assess the performance and cost of alternative paints. These efforts are providing valuable information on the status of antifouling technologies and strategies used worldwide, as well as insight into how various non-copper coatings perform in San Diego Bay. Much of this work is being conducted through the EPA funded "Safer Alternatives to Copper Antifouling Paints" project.

How will the Port's efforts affect boaters?

The Port has found that switching to alternative, non-copper based paints is an effective means to achieving compliance with regulatory requirements and that the proper use of Best Management Practices is essential to reduce copper levels from in-water hull cleaning.

The Port's research will provide boaters with valuable information on available alternative coatings to assist in identifying effective alternatives to which they may convert.

At the present time, conversion to alternative coatings is voluntary. However, stricter measures may be forthcoming to ensure regulatory compliance is met. By being informed, boaters can help protect marine life by selecting a non-copper paint and using proper hull cleaning practices and working with local marinas and boatyards to promote the use of non-copper alternatives.

For more information, go to the Port of San Diego's website: portofsandiego.org/environment/alternative-hull-paints.html

MAKE A DIFFERENCE TODAY!

What can boaters do?

Commit to the Environment

Resolve to apply a non-copper paint to your boat.

Be Informed

There are effective, antifouling, non-copper hull paints available today. Identify which alternative option is appropriate for your boat. Look for incentive programs to help cover hull paint conversion costs.

How to Choose a Hull Paint Product

1- Consider your boat style and use.



racer



work boat



inactive



cruiser



pleasure craft

2- Determine long-term maintenance and reapplication costs.



Offer for Shelter Island Yacht Basin Boaters

FREE COPPER HULL PAINT REMOVAL

Regulations are in place in the Shelter Island Yacht Basin (SIYB) requiring the reduction of copper pollution from boat hull paints. In response, the Port of San Diego has received a grant to provide assistance to SIYB boaters to transition their boats to non-copper hull paints. The "Hull Paint Transition Project" is an incentive program for SIYB boaters that will cover the cost of removing the existing copper paint from your boat. To find out more information on this program, visit the Port's website.

FOR MORE INFORMATION:

www.portofsandiego.org/environment/copper-reduction-program

(619) 686-6254



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Port of San Diego

COPPER REDUCTION

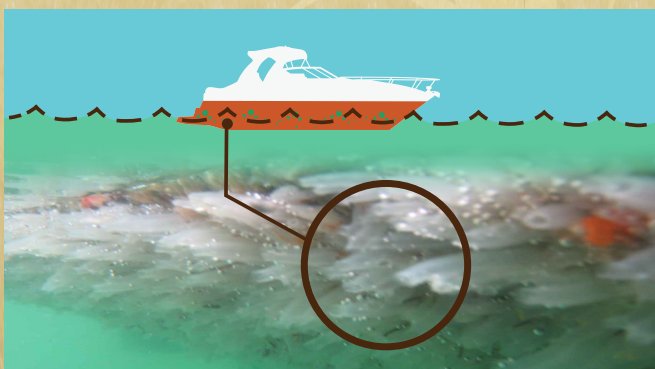
program



The most effective way to reduce pollution is to remove the source.

Did you know that copper, found in many boat hull paints, is toxic to marine life? Copper-based paints have been used to prevent fouling on boat hulls for many years.

What is fouling? It's the accumulation of unwanted aquatic life such as mussels, worms and algae on the underside of boat hulls. Fouling increases fuel use and lowers boat speed.




Hull paints are necessary to maintain your boat and prevent fouling. However, hull paint does not need to pollute the environment. The Port of San Diego is conducting research that will provide boaters with information on copper-free alternative hull paints.



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“Safer Alternatives to Copper Based Antifouling Paints for Marine Vessels” Project - Alternative Hull Coating Selection Matrix

		Initial Hull Preparation and Coating Application (For 30' Boat)			Long-Term Cost (For 30' Boat)	Longevity	Cleaning Maintenance		Special Considerations
Boat Use	Coating Category	One Time Stripping Required?	Method	One Time Cost ²	Annualized Cost Over 30 year Period ²	Estimated Years Until Repainting ³	Optimal Inspection Frequency	Resistance to Cleaning Impacts ³	
I,F,P,R	Soft Non-Biocide ¹	Yes	S	\$\$\$	\$-\$\$	5-10	3 to 4 weeks	Good	NB,1
			R	\$\$\$	\$				
I,P,T,R	Hard Non-Biocides ¹	Yes	S or R	\$\$\$	\$\$	7.5-10	3 to 4 weeks / winter 2 weeks / summer	Excellent	NB,2
Cr,P	Zinc Oxide Non-biocide ¹	Depends on specific coating	R	\$-\$\$	\$\$-\$\$\$	1.5-2	3 to 4 weeks	Fair	NB,1,3,4
Cr,P	Organic Biocide	No	R	\$-\$\$	\$\$\$	1-1.5	3 to 4 weeks	Fair	B,1,3,4
F,Cr,P,T	Zinc Biocide	No	R	\$-\$\$	\$\$	1.5-2	3 to 4 weeks	Fair	B,1,3,4
BOAT USE KEY Inactive (I) Frequent-Use Power (F) Racers –Sail (R) Cruisers (Cr) Trailer (T) Pleasure (P)		Yes/No <i>Stripping may be required for initial application, but may not be required for subsequent applications</i>	Spray (S) Roller (R)	\$ = \$900-1,500 \$\$ = \$1,501-2,000 \$\$\$ = \$2,001+ <i>One time cost for soft and hard non-biocides includes stripping costs.</i>			<i>Cleaning may not be required during every inspection. The appropriate cleaning strategy should reduce or prevent the removal (i.e., thinning) of hull paint.</i>		NB= Product does not contain biocide B = Biocide containing product 1=Soft cleaning tools, extra care for cleaning, 2= Periodic cleaning by power tool is acceptable 3= Cleaning likely not necessary for 90-120 days after application 4= May require more coats at waterline

¹ The non-biocide paints identified in this table include only those products that do not require registration with California Department of Pesticide Regulation at the time of publishing.

² Prices based on information gathered during 2009-2010 from San Diego Bay boatyards.

³ Assumes use of appropriate cleaning strategy