

# UNCLASSIFIED

EXHIBIT R-2, RDT&E Budget Item Justification	DATE: <b>February 2007</b>
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APPROPRIATION/BUDGET ACTIVITY	R-1 ITEM NOMENCLATURE							
<b>RESEARCH DEVELOPMENT TEST &amp; EVALUATION, NAVY / BA-4</b>	PE0603721N / Environmental Protection							
COST (\$ in Millions)	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013
Total PE Cost	26.956	25.972	19.850	20.297	20.989	21.436	21.830	22.243
Shipboard Waste Management / 0401	8.812	7.053	6.578	7.036	7.108	7.561	7.712	7.871
Environmental Compliance / 2210*	0.829	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Pollution Abatement / 0817	7.271	8.895	8.936	8.877	9.452	9.399	9.559	9.727
Marine Mammal Research/ 9204	4.345	4.247	4.336	4.384	4.429	4.476	4.559	4.645
Issue 9999 - Congressional Adds**	5.699	5.777	0.000	0.000	0.000	0.000	0.000	0.000

**A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION:**

(U) Many environmental laws, regulations, and policies impose restrictions on Navy vessels, aircraft, and facilities that interfere with operations and/or increase the cost of operations. The Navy must be able to conduct its national security mission in compliance with applicable environmental requirements in the U.S. and abroad without compromising performance, safety, or health, while simultaneously minimizing the cost of compliance. This program develops and evaluates processes, hardware, systems, and operational procedures that will allow the Navy to operate in U.S., foreign, and international waters, air, space, and land areas while complying with environmental laws, regulations, Executive Orders, policies and international agreements. Projects support the Navy's compliance with: OPNAVINST 5090.1B CH-4 and other DoD and Navy environmental-related policies; the Clean Water Act, Clean Air Act, Act to Prevent Pollution from Ships, National Environmental Policy Act, Marine Plastic Pollution Research and Control Act, Endangered Species Act, Marine Mammal Protection Act, Resource Conservation and Recovery Act, Toxic Substances Control Act, U.S. Public Vessel Medical Waste Anti-Dumping Act, and Federal Facility Compliance Act; and Executive Orders 12088, 12114, 12843, 13089, 13101, 13112, 13148, and 13158. Project 0401 supports RDT&E efforts that enable Navy ships and submarines to comply with laws, regulations, and policies in four major areas: ozone depleting substances, liquid wastes, solid wastes, and hazardous and other wastes. Project 2210 supports RDT&E that enables Navy compliance with environmental laws, regulations and policies impacting the basing, re-alignment, operation, repair, and replacement of Naval aircraft in four major areas: engine emissions, air vehicle hazardous materials and wastes, ozone depleting substances, and aviation shipboard emissions. Project 0817 supports RDT&E to develop and validate technologies to enable Navy facilities to comply with environmental laws, regulations, and policies in a cost-effective manner. Project 9204 supports RDT&E to develop planning and monitoring tools for minimizing Fleet contacts with and potential harrassment of protected marine animals in response to Federal laws and regulations and public scrutiny.

\* In FY07, the requirements and funding of Project 2210 are combined with Project 0817.

\*\* Issue 9999 is comprised of FY06 and FY07 Congressional adds.

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APPROPRIATION/BUDGET ACTIVITY <b>RDT&amp;E, N / BA-4</b>	R-1 Item Nomenclature: PE0603721N / Environmental Protection
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**B. PROGRAM CHANGE SUMMARY:**

Funding:	FY 2006	FY 2007	FY 2008	FY 2009
Previous President's Budget: (FY 07 Pres Controls)	27.547	20.271	21.301	21.555
Current BES/OSD Budget:	26.956	25.972	19.850	20.297
Total Adjustments	-0.591	5.701	-1.451	-1.258

Summary of Adjustments

FY06 SBIR Tax	-0.505			
Congressional Undistributed Reductions	-0.048			
Undistributed General Reductions	-0.018			
Department of Energy Transfer				
Program Adjustments			-1.451	-1.258
Execution Adjustments				
Rate Adjustments				
Revised Economic Assumptions	-0.020	-0.099		
Congressional Add		5.800		
Subtotal	-0.591	5.701	-1.451	-1.258

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EXHIBIT R-2a, RDT&E Project Justification							DATE: <b>February 2007</b>	
APPROPRIATION/BUDGET ACTIVITY <b>RDT&amp;E, N / BA-4</b>		PROGRAM ELEMENT NUMBER AND NAME PE0603721N / Environmental Protection			PROJECT NUMBER AND NAME 0401 / Shipboard Waste Management			
COST (\$ in Millions)	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013
Project Cost	<b>8.812</b>	<b>7.053</b>	<b>6.578</b>	<b>7.036</b>	<b>7.108</b>	<b>7.561</b>	<b>7.712</b>	<b>7.871</b>
RDT&E Articles Qty								

**A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION:**

(U) Navy ships and submarines must routinely operate in U.S., international, and foreign waters, and visit numerous U.S. and foreign ports. No body of water is without environmental restrictions that impact the movements and operations of Navy vessels. Environmental requirements tend to be most restrictive in port and in coastal waters, where the Navy's increasing littoral presence places ships and submarines in discharge-restricted waters for longer periods of time. Growing international cooperation in addressing global environmental concerns is resulting in expanding areas of ocean considered environmentally susceptible, where special prohibitions on ship discharges and operations are imposed. Navy vessels must comply with applicable environmental legal requirements while maintaining continued access to all waters for operations, exercises, training, and port access. The large crews and limited onboard space of Navy ships and submarines severely constrain their ability to hold wastes for return to port for shoreside disposal. This project develops and evaluates shipboard waste processing equipment, systems, and data to enable ships and submarines to manage their wastes in an environmentally-compliant, safe, and operationally-compatible manner. It also addresses afloat environmental issues other than shipboard wastes, e.g., hull antifouling and access to environmental data for planning Fleet operations and exercises.

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APPROPRIATION/BUDGET ACTIVITY <b>RDT&amp;E, N / BA-4</b>	PROGRAM ELEMENT NUMBER AND NAME PE0603721N / Environmental Protection	PROJECT NUMBER AND NAME 0401 / Shipboard Waste Management
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**B. Accomplishments/Planned Program**

	FY 06	FY 07	FY 08	FY 09
Ozone Depleting Substances	0.100	0.000	0.000	0.000
RDT&E Articles Quantity				

**FY 06:** (U) Completed development of solutions for lubrication and engineering design problems in surface ship CFC-114 air-conditioning plant conversion designs.

	FY 06	FY 07	FY 08	FY 09
Technical Authority	0.000	0.000	1.985	2.642
RDT&E Articles Quantity				

**FY 08:** (U) Develop environmental equipment/system requirements documentation, design criteria and guidance, specifications and standards, and certification protocols, and perform test and evaluation, to facilitate execution of technical authority for legacy and new-design ship and submarine environmental capabilities.

**FY 09:** (U) Continue developing environmental equipment/system requirements documentation, design criteria and guidance, specifications and standards, and certification protocols, and perform test and evaluation, to facilitate execution of technical authority for legacy and new-design ship and submarine environmental capabilities.

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APPROPRIATION/BUDGET ACTIVITY <b>RDT&amp;E, N / BA-4</b>	PROGRAM ELEMENT NUMBER AND NAME PE0603721N / Environmental Protection	PROJECT NUMBER AND NAME 0401 / Shipboard Waste Management
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**B. Accomplishments/Planned Program**

	FY 06	FY 07	FY 08	FY 09
Integrated Liquid Wastes	5.300	5.100	2.915	2.836
RDT&E Articles Quantity				

**FY 06:** (U) Continued support of rulemaking process with Environmental Protection Agency (EPA) in development of Uniform National Discharge Standards (UNDS) for liquid waste discharges from Navy vessels: continued discharge analyses and setting of Marine Pollution Control Device (MPCD) performance standards. Continued development of integrated liquid waste treatment system: continued development of MPCD treatment systems; completed development of shipboard Oil Pollution Abatement System improvements; continued evaluation of commercial non-oily wastewater treatment systems.

**FY 07:** (U) Continue support of rulemaking process with Environmental Protection Agency (EPA) in development of Uniform National Discharge Standards (UNDS) for liquid waste discharges from Navy vessels: continue discharge analyses and setting of Marine Pollution Control Device (MPCD) performance standards. Continue development and evaluation of MPCD treatment systems, technologies, and procedures. Continue evaluation of commercial non-oily wastewater treatment systems.

**FY 08:** (U) Continue support of rulemaking process with Environmental Protection Agency (EPA) in development of Uniform National Discharge Standards (UNDS) for liquid waste discharges from Navy vessels: continue discharge analyses and setting of Marine Pollution Control Device (MPCD) performance standards. Continue development and evaluation of MPCD treatment systems, technologies, and procedures. Continue evaluation of commercial non-oily wastewater treatment systems.

**FY 09:** (U) Continue support of rulemaking process with Environmental Protection Agency (EPA) in development of Uniform National Discharge Standards (UNDS) for liquid waste discharges from Navy vessels: continue discharge analyses and setting of Marine Pollution Control Device (MPCD) performance standards. Continue development and evaluation of MPCD treatment systems, technologies, and procedures. Continue evaluation of commercial non-oily wastewater treatment systems.

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APPROPRIATION/BUDGET ACTIVITY <b>RDT&amp;E, N / BA-4</b>	PROGRAM ELEMENT NUMBER AND NAME PE0603721N / Environmental Protection	PROJECT NUMBER AND NAME 0401 / Shipboard Waste Management
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**B. Accomplishments/Planned Program (Cont.)**

	FY 06	FY07	FY 08	FY 09
Solid Wastes	0.050	0.000	0.000	0.000
RDT&E Articles Quantity				

**FY 06:** (U) Completed evaluation of commercial thermal destruction systems for shipboard solid wastes.

	FY 06	FY 07	FY 08	FY 09
Hazardous and Other Major Ship Wastes	3.362	1.953	1.678	1.558
RDT&E Articles Quantity				

**FY 06:** (U) Continued shipboard hazardous materials substitution and elimination process and continued test and evaluation of pollution-prevention equipment aboard surface ships and submarines. Continued development and testing of new low/no-copper underwater hull antifouling coatings. Continued development of underwater hull cleaning system. Continued development of Environmental Information Management System (EIMS).

**FY 07:** (U) Continue shipboard hazardous materials substitution and elimination process and continue test and evaluation of pollution-prevention equipment aboard surface ships and submarines. Continue development and testing of new low/no-copper underwater hull antifouling coatings. Complete development of underwater hull cleaning system. Complete development of Environmental Information Management System (EIMS).

**FY 08:** (U) Continue shipboard hazardous materials substitution and elimination process and continue test and evaluation of pollution-prevention equipment aboard surface ships and submarines. Continue development and testing of new low/no-copper underwater hull antifouling coatings.

**FY 09:** (U) Continue shipboard hazardous materials substitution and elimination process and continue test and evaluation of pollution-prevention equipment aboard surface ships and submarines. Continue development and testing of new low/no-copper underwater hull antifouling coatings.

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**CLASSIFICATION:**

EXHIBIT R-2a, RDT&E Project Justification			DATE: <b>February 2007</b>							
APPROPRIATION/BUDGET ACTIVITY <b>RDT&amp;E, N / BA-4</b>	PROGRAM ELEMENT NUMBER AND NAME PE0603721N / Environmental Protection	PROJECT NUMBER AND NAME 0401 / Shipboard Waste Management								
<b>C. OTHER PROGRAM FUNDING SUMMARY:</b>										
<u>Line Item No. &amp; Name</u>	<u>FY 2006</u>	<u>FY 2007</u>	<u>FY 2008</u>	<u>FY 2009</u>	<u>FY 2010</u>	<u>FY 2011</u>	<u>FY 2012</u>	<u>FY 2013</u>	To Complete	Total Cost
(U) Demonstrated and validated technologies are transitioned to various SCN, OPN, and O&MN budget accounts for implementation as part of a Fleet modernization program or new ship construction.										
(U) Related RDT&E: (U) Defense Research Sciences/Shipboard Processes (PE 61153N / 3162)										
(U) Related RDT&E: (U) Readiness, Training, and Environmental Quality/Logistics and Environmental Quality (PE 62233N)										
<b>D. ACQUISITION STRATEGY:</b>										
(U) RDT&E Contracts are Competitive Procurements.										
<b>E. MAJOR PERFORMERS</b>										

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Exhibit R-3 Cost Analysis (page 1)										DATE: <b>February 2007</b>				
APPROPRIATION/BUDGET ACTIVITY			PROGRAM ELEMENT			PROJECT NUMBER AND NAME								
<b>RDT&amp;E, N / BA-4</b>			PE0603721N / Environmental Protection			0401 / Shipboard Waste Management								
Cost Categories	Contract Method & Type	Performing Activity & Location	Total P Y s Cost	FY 06 Cost	FY 06 Award Date	FY 07 Cost	FY 07 Award Date	FY 08 Cost	FY 08 Award Date	FY 09 Cost	FY 09 Award Date	Cost to Complete	Total Cost	Target Value of Contract
Ancillary Hardware Development	Various	Misc. Contracts	18.484	0.365		0.300		0.200		0.200		N/A	N/A	N/A
Primary Hardware Development	C/CPFF	Oceaneering	1.000										1.000	
Ship Integration													0.000	
Ship Suitability													0.000	
Systems Engineering	C/CPFF	John J. McMullen & Son	4.487									Cont	Cont	N/A
Training Development													0.000	
Licenses													0.000	
Tooling													0.000	
GFE													0.000	
Award Fees													0.000	
<b>Subtotal Product Development</b>			<b>23.971</b>	<b>0.365</b>		<b>0.300</b>		<b>0.200</b>		<b>0.200</b>		<b>Cont</b>	<b>Cont</b>	<b>N/A</b>
Remarks: (1) Hardware Development and Systems Engineering Tasks use CPFF Delivery Contracts for Continuing Development of Pollution Abatement Hardware and Ship Systems Engineering Analysis.														
Development Support													0.000	
Software Development	WR	SPAWARS, Charleston, SC	9.838	1.000		0.000		0.000		0.000		0.000	10.838	0.000
Training Development													0.000	
Integrated Logistics Support													0.000	
Configuration Management													0.000	
Technical Data													0.000	
GFE													0.000	
Award Fees													0.000	
<b>Subtotal Support</b>			<b>9.838</b>	<b>1.000</b>		<b>0.000</b>		<b>0.000</b>		<b>0.000</b>		<b>0.000</b>	<b>10.838</b>	
Remarks:														

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Exhibit R-3 Cost Analysis (page 2)											DATE: <b>February 2007</b>			
APPROPRIATION/BUDGET ACTIVITY			PROGRAM ELEMENT			PROJECT NUMBER AND NAME								
<b>RDT&amp;E, N / BA-4</b>			PE0603721N / Environmental Protection			0401 / Shipboard Waste Management								
Cost Categories	Contract Method & Type	Performing Activity & Location	Total P Y s Cost	FY 06 Cost	FY 06 Award Date	FY 07 Cost	FY 07 Award Date	FY 08 Cost	FY 08 Award Date	FY 09 Cost	FY 09 Award Date	Cost to Complete	Total Cost	Target Value of Contract
Developmental Test & Evaluation	WR	NSWCDD, Bethesda, MD	148.024	3.860		3.900		3.900		4.300		Cont	Cont	N/A
Developmental Test & Evaluation	WR	NRL, Wash, DC	28.682	0.500		0.400		0.400		0.300		Cont	Cont	N/A
Developmental Test & Evaluation	WR	SPAWARSYSCEN, SD, CA	11.070	0.300		0.200		0.300		0.350		Cont	Cont	N/A
Developmental Test & Evaluation	WR	Misc. Govt Labs	22.832	0.000		0.000		0.000		0.000		Cont	Cont	N/A
Developmental Test & Evaluation	C/CPFF	SAIC, San Diego, CA	14.651	0.600		0.500		0.500		0.550		Cont	Cont	N/A
Developmental Test & Evaluation	C/CPFF	Misc. Contracts	12.274	0.249		0.133		0.158		0.216		Cont	Cont	N/A
Process Control Engineering	C/CPFF	M. Rosenblatt & Sons	1.500	1.500		1.500		1.000		1.000			5.500	
Developmental Test & Evaluation	PD	ONR, Arlington, VA	0.400										0.400	
Developmental Test & Evaluation	WR	Naval Postgraduate School	1.800										1.800	
Process Control Engineering	MIPR	EPA, Hdqtrs	0.400	0.340		0.100		0.100		0.100			0.940	
GFE													0.000	
Award Fees													0.000	N/A
Subtotal T&E			241.633	7.349		6.733		6.358		6.816		0.000	Cont	N/A
Remarks:														
Contractor Engineering Support													0.000	
Government Engineering Support													0.000	
Program Management Support													0.000	
Travel			0.230	0.020		0.020		0.020		0.020			Cont	
Labor (Research Personnel)													0.000	
SBIR Assessment				0.078									0.078	
Subtotal Management			0.230	0.098		0.020		0.020		0.020		0.000	Cont	
Remarks:														
Total Cost			275.672	8.812		7.053		6.578		7.036		Cont	Cont	Cont
Remarks:														



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EXHIBIT R-2a, RDT&E Project Justification							DATE: <b>February 2007</b>	
APPROPRIATION/BUDGET ACTIVITY <b>RDT&amp;E, N / BA-4</b>		PROGRAM ELEMENT NUMBER AND NAME 0603721N, Environmental Protection			PROJECT NUMBER AND NAME 2210, Environmental Compliance			
COST (\$ in Millions)	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013
2210 ENVIRONMENTAL COMPLIANCE	<b>0.829</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>
RDT&E Articles Qty								

**A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION:**

A. (U) Mission Description and Budget Item Justification: This project supports development and implementation of technologies that will lead to environmentally safe naval aviation operations and support; compliance with international, federal, state, and local regulations and policies; reduction of increasing compliance costs and personal liability; and enhancement of naval aviation mission readiness and effectiveness. This project will support aviation compliance and pollution prevention technologies, as well as additional operational and shipboard aviation requirements previously unsupported. Specific regulatory requirements include Executive Orders 12873 (Recycling & Waste Prevention) and 13148, the National Environmental Policy Act (NEPA), Clean Air Act (CAA) Title I, National Ambient Air Quality Standard (NAAQS), relating to pollutants aircraft contribute to base air emission limits (volatile organic compounds (VOCs), particulate matter (PM), oxides of nitrogen (NOx), oxides of sulfur (SOx), and unburned hydrocarbons (UHCs)), the National Emission Standards for Hazardous Air Pollutants (NESHAPs), the Clean Water Act (CWA), the Resource Conservation and Recovery Act (RCRA), as well as Occupational, Safety and Health Administration (OSHA) standards. Funding is realigned from RDT&E 2210 to 0817 beginning in Fiscal Year 2007.

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APPROPRIATION/BUDGET ACTIVITY <b>RDT&amp;E, N /</b>	PROGRAM ELEMENT NUMBER AND NAME 0603721N, Environmental Protection	PROJECT NUMBER AND NAME 2210, Environmental Compliance
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**B. Accomplishments/Planned Program**

	FY 06	FY 07	FY 08	FY 09
Accomplishments/Effort/Subtotal Cost	0.829			

**Engine Emissions Technology:**

(U) Research, develop and test low emissions technology for gas turbine engines. Objectives include test, demonstrate and validate jet fuel additives for pollution prevention and compliance, gas turbine engine particulate matter measurement and testing technology, low emissions combustor technology, aircraft source noise modeling and mitigation technologies.

**Aircraft Hazardous Materials and Shipboard Waste Reduction:**

(U) Research, develop and test alternatives to aircraft and propulsion and power systems manufacture, finishing and repair processes that generate toxic heavy metals, hazardous air pollutants (HAPs) and volatile organic compounds (VOCs). Objectives include the test, demonstration and validation of aircraft structural stainless steels, long life lead and cadmium free aircraft batteries and shipboard validation of corrosion and composite repair kits, environmentally compliant cleaners, coatings and coatings maintenance technologies repair kits.

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APPROPRIATION/BUDGET ACTIVITY <b>RDT&amp;E, N / BA-4</b>	PROGRAM ELEMENT NUMBER AND NAME 0603721N, Environmental Protection	PROJECT NUMBER AND NAME 2210, Environmental Compliance
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**C. OTHER PROGRAM FUNDING SUMMARY:**

<u>Line Item No. &amp; Name</u>	<u>FY 2006</u>	<u>FY 2007</u>	<u>FY 2008</u>	<u>FY 2009</u>	<u>FY 2010</u>	<u>FY 2011</u>	<u>FY 2012</u>	<u>FY 2013</u>	<u>To Complete</u>	<u>Total Cost</u>
PE 0603851D (Environmental Security Technology Certification Program)										

**D. ACQUISITION STRATEGY:**

Technologies developed under this project are demonstrated and validated primarily through competitive procurements. Validated technology is transitioned to users through new or revised performance specifications, technical manuals or competitive procurements of subsystems, materials or processes.

**E. MAJOR PERFORMERS:**

		<u>FY 2006 Award Date</u>	<u>FY 2007 Award Date</u>	<u>FY 2008 Award Date</u>	<u>FY 2009 Award Date</u>
NAWCAD, Patuxent River, MD	Test and Evaluation	3/14/06			

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Exhibit R-3 Cost Analysis (page 1)											DATE: <b>February 2007</b>				
APPROPRIATION/BUDGET ACTIVITY			PROGRAM ELEMENT			PROJECT NUMBER AND NAME									
<b>RDTE&amp;E, N / BA-4</b>			0603721N, Environmental Protection			2210, Environmental Compliance									
Cost Categories	Contract Method & Type	Performing Activity & Location	Total PY s Cost	FY 06 Cost	FY 06 Award Date	FY 07 Cost	FY 07 Award Date	FY 08 Cost	FY 08 Award Date	FY 09 Cost	FY 09 Award Date	Cost to Complete	Total Cost	Target Value of Contract	
Primary Hardware Development													0.000		
Ancillary Hardware Development													0.000		
Aircraft Integration													0.000		
Ship Integration													0.000		
Ship Suitability													0.000		
Systems Engineering													0.000		
Training Development													0.000		
Licenses													0.000		
Tooling													0.000		
GFE													0.000		
Award Fees													0.000		
Subtotal Product Development			0.000			0.000		0.000		0.000		0.000	0.829		
Remarks:															
Development Support													0.000		
Software Development													0.000		
Integrated Logistics Support													0.000		
Configuration Management													0.000		
Technical Data													0.000		
Studies & Analyses													0.000		
GFE													0.000		
Award Fees													0.000		
Subtotal Support			0.000	0.000		0.000				0.000		0.000	0.000		
Remarks:															

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Exhibit R-3 Cost Analysis (page 2)											DATE: <b>February 2007</b>				
APPROPRIATION/BUDGET ACTIVITY			PROGRAM ELEMENT			PROJECT NUMBER AND NAME									
<b>RDT&amp;E, N / BA-4</b>			0603721N, Environmental Protection			2210, Environmental Compliance									
Cost Categories	Contract Method & Type	Performing Activity & Location	Total PY s Cost	FY 06 Cost	FY 06 Award Date	FY 07 Cost	FY 07 Award Date	FY 08 Cost	FY 08 Award Date	FY 09 Cost	FY 09 Award Date	Cost to Complete	Total Cost	Target Value of Contract	
Developmental Test & Evaluation															
Operational Test & Evaluation		NADEP, Cherry Point, NC		0.068									0.068		
Operational Test & Evaluation		NAWCAD, Pax River, MD		0.705									0.705		
Live Fire Test & Evaluation													0.000		
Test Assets													0.000		
Tooling													0.000		
GFE													0.000		
Award Fees													0.000		
Subtotal T&E			0.000	0.772		0.000		0.000		0.000		0.000	0.772		
Remarks:															
Contractor Engineering Support													0.000		
Government Engineering Support													0.000		
Program Management Support													0.000		
Travel		NAVAIR, Pax River, MD		0.057									0.057		
Transportation													0.000		
SBIR Assessment													0.000		
Subtotal Management			0.000	0.057		0.000		0.000		0.000		0.000	0.057		
Remarks:															
Total Cost			0.000	0.829		0.000		0.000		0.000		0.000	0.829		
Remarks:															

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APPROPRIATION/BUDGET ACTIVITY <b>RDT&amp;E, N / BA-4</b>		PROGRAM ELEMENT NUMBER AND NAME PE0603721N / Environmental Protection			PROJECT NUMBER AND NAME 0817 / Pollution Abatement Ashore			
COST (\$ in Millions)	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013
Project Cost	<b>7.271</b>	<b>8.895</b>	<b>8.936</b>	<b>8.877</b>	<b>9.452</b>	<b>9.399</b>	<b>9.559</b>	<b>9.727</b>
RDT&E Articles Qty								

**A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION:**

(U) Inherent to the realization of the vision outlined in Sea Power 21 are certain environmental consequences that will, to a lesser or greater degree, impact on the Navy's ability to fully achieve the strategy outlined in the Navy Capability Pillars (NCP) SEA SHIELD, SEA STRIKE, SEA BASING and FORCENet and the supporting initiatives of SEA WARRIOR, SEA TRIAL and SEA ENTERPRISE. Readiness and training are primary considerations for determining whether any fighting force is at its peak proficiency. The ability to train our forces in a realistic environment is paramount. Today's reality requires training and operating within environmental constraints (national and international laws and agreements), and searching for alternatives to comply with and alleviate those constraints. Moreover, as we develop new systems and technologies in support of Sea Power 21, the Navy must anticipate potential environmental regulations which, while not currently an issue, could in the future adversely impact our ability to project and sustain our forces at home and abroad.

This program identifies pervasive Navy shoreside environmental requirements and develops and validates information, new processes, and technologies that address requirements that pose significant impact on Naval shore activities in complying with environmental laws, regulations, orders, and policies. The goal of the program is to maximize opportunities for significant cost savings while minimizing personnel liabilities, operational costs, and regulatory oversight and preserving or enhancing the ability of Naval shore activities to accomplish their required missions and functions in support of the Navy's transformational strategy. Program investments supports 4 of 5 Environmental Enabling Capabilities (EEC-2 through 5) that are required to meet the objectives of Sea Power 21 as detailed in the POM06 Integrated Navy Environmental Readiness Capability Assessment for S&T and DT&E.

**(U) EEC-2 MAXIMIZE TRAINING AND TESTING RANGE REQUIREMENTS WITHIN ENVIRONMENTAL CONSTRAINTS**

(U) This capability addresses environmental impacts and restrictions at Navy land and sea ranges, including munitions testing and manufacturing, to ensure Navy ranges are available to conduct required training and testing operations for the Fleet. Investments in EEC-2 provide validated knowledge, models, and processes to mitigate environmental impacts, restrictions, and costs at Navy training and test ranges to maximize the availability and utilization of the ranges. The results support operational readiness by providing the tools and technologies necessary for sustaining and managing Navy land and sea ranges related to UXO and munitions, encroachment, air quality, airborne noise, water quality, and wetlands. Capabilities gained include the ability to assess and determine the risks from underwater UXO, the evaluation and prioritization of ordnance contaminated sites for evaluation in environmental programs, and the implementation of range specific best management practices by evaluating and modeling available process, procedures, and technologies.

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EXHIBIT R-2a, RDT&E Project Justification		DATE: <b>February 2007</b>
APPROPRIATION/BUDGET ACTIVITY <b>RDT&amp;E, N / BA-4</b>	PROGRAM ELEMENT NUMBER AND NAME PE0603721N / Environmental Protection	PROJECT NUMBER AND NAME 0817 / Pollution Abatement Ashore
<p>(U) EEC-3 PLATFORM MAINTENANCE AND REPAIR WITH MINIMAL ENVIRONMENTAL FOOTPRINT</p> <p>(U) This capability focuses on minimizing or eliminating environmental impact related to Navy and Marine Corps weapon system O, I, and D level repair and maintenance operations. Investments in EEC-3 provide valid knowledge, models, process, and technologies to minimize regulated emissions, discharges and hazardous material usage during the repair and maintenance of ships, submarines, and surface/sub-surface vehicles and aircraft and air vehicles. The program supports Fleet operational readiness and Navy acquisition communities by investing in information to understand emerging environmental requirements and to develop innovative processes and technologies that result in savings while reducing the fleet environmental constraints related to platform maintenance. Capabilities and benefits gained include, but are not limited to, the reduction in the usage of heavy metals used in metal finishing (chromium and cadmium), reduced hazardous air pollutant (HAP) emissions, and the development of best management practices and tools to minimize the use of hazardous materials and the generation of hazardous wastes associated with maintaining and repairing ships, submarines and aircraft and unmanned vehicles. Results of program investments will be leveraged across weapon system and platform acquisition to ensure continued reduction in lifecycle costs and long-term environmental compliance burdens to the Fleet.</p> <p>(U) EEC-4. SUPPORT SHORE READINESS WITHIN ENVIRONMENTAL CONSTRAINTS</p> <p>(U) Naval shore establishment requires the capability to operate and maintain facilities and provide waterfront and airfield services to the fleet while complying with applicable environmental regulations and minimizing environmental impacts and costs. The program invests in knowledge and innovative processes and technologies that minimize infrastructure and operational costs, regulated emissions, while minimizing discharges and hazardous material usage from ship (waterfront) and aviation operations. Capabilities and benefits gained under EEC-4 include reduced costs associated with wastewater treatment, elimination/reduction in the use of HAPs/ODS/VOCs and the associated reporting requirements, reduced hazardous waste and disposal costs, and improved storm water management.</p> <p>((U) EEC-5. COST-EFFECTIVE MANAGEMENT OF ENVIRONMENTAL REGULATORY REQUIREMENTS</p> <p>(U) The environmental compliance regulations require base managers to permit, monitor and report on many processes associated with weapon system and platform operations. Naval shore environmental managers require the capability to efficiently and cost effectively manage these compliance requirements. Under EEC-5, the program invests in improved data collection, methods, and models to assess environmental impacts and ecological risk assessments of Naval operations on harbors, US waterways, and surrounding communities. Benefits include gaining standardized technical environmental management improvements/techniques related to source control, assessment, and monitoring. EEC-5 also provides validated knowledge, models, processes and technologies to improve environmental monitoring and reporting, and to reduce the cost of compliance with regulations applicable to coastal contamination and contaminated sediments.</p>		

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APPROPRIATION/BUDGET ACTIVITY <b>RDT&amp;E, N / BA-4</b>	PROGRAM ELEMENT NUMBER AND NAME PE0603721N / Environmental Protection	PROJECT NUMBER AND NAME 0817 / Pollution Abatement Ashore
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**B. Accomplishments/Planned Program - EEC-2 Maximize Training and Testing Range Requirements Within Environmental Constraints**

	FY 06	FY 07	FY 08	FY 09
Maximize Training and Testing Requirements Within Environmental Constraints	1.687	2.456	2.888	3.029
RDT&E Articles Quantity				

**FY06:** (U) The tasks in this EEC support the requirements for addressing the transport, fate, and effects of underwater UXO needed to support scientifically valid decisions. Toxicity and Degradation Study of Ordnance in Marine Sediments and Waters will determine the applicability of existing fresh-water data and allow for the development of a comprehensive data set regarding the degradation rates, adsorption coefficients and solubility of munitions constituents in marine water and sediments. Localized corrosion tests will determine the corrosion scenarios associated with ordnance underwater. UXO Transport Evaluations will determine the physical transport mechanisms associated with underwater ordnance items for use in developing an Underwater UXO Risk Assessment Model. Development of a comprehensive data set on toxicity of munitions constituents to regulatory acceptable marine species will define potential bioaccumulation, cellular level impacts, and trophic transfer. The toxicity analysis of TNT in water and sediment exposures and the toxicity of RDX and HMX in water exposures will be defined. The analysis of the long term disposition of seafloor cables will identify cable impacts to the marine environments aiding the sustainment and management of Navy underwater ranges and support new underwater surveillance systems that require the laying of seafloor hardware and cables. The initiation of the Shallow Water Test Range (SWTR) Seafloor Cable Baseline Assessment will establish a baseline condition from which any adverse effects associated with seafloor ranges, in particular, seafloor communication cables can be determined. Development of a range residue management tool will provide range managers with the capability to project range residue management and manage processing costs based on what if scenarios allowing managers to implement range specific best management practices. The development of the dataset necessary to calculate ecological soil screen levels (Eco-SSL) for munitions and explosive related chemicals will allow the Navy to better assess the potential for adverse effects at sites where soil contamination due to munitions or explosive constituents is a concern. Development of direct push and point-and-detect sensor systems, for use in the field, will allow the measurement of perchlorate either for rapid screening and monitoring purposes or for contaminant source characterization of perchlorate in groundwater or surface waters.

**FY07:** (U) Continue providing validated knowledge, models, and processes to mitigate environmental impacts, restrictions, and costs at Navy training and test range to maximize the availability and utilization of the ranges. Continuing efforts include analysis of the effects of underwater UXO in order to give the Navy the ability to assess and determine the risks from underwater UXO, analysis on the long term disposition of underwater cables, and the development of range residue management tools to ensure the continued operation of Navy testing and training ranges. Increased efforts on the SWTR Seafloor Cable Baseline Assessment will continue sampling in order to finish establishing a baseline condition from which any adverse effects associated with seafloor ranges, in particular, seafloor communication cables can be determined. Continue developing direct push and point-and-detect sensor systems for perchlorate.

**FY08:** (U) Continued efforts on the SWTR Seafloor Cable Baseline Assessment will continue sampling in order to finish establishing a baseline condition from which any adverse effects associated with seafloor ranges, in particular, seafloor communication cables can be determined. Continue providing validated knowledge, models, and process to mitigate environmental impacts, restrictions, and costs at Navy training and test range to maximize the availability and utilization of the ranges. Continuing efforts will address energetic emission for open burn/open detonation permitting, evaluate underwater blow-in-place detonation mitigation techniques, and the evaluation of the environmental effects of abandoned equipment in Navy ocean ranges. Continue developing direct push and point-and-detect sensor systems for perchlorate.

**FY09:** (U) Conclusion of efforts on the SWTR Seafloor Cable Baseline Assessment will allow decision makers to determine a long term monitoring strategy for the underwater range. Continue providing validated knowledge, models, and processes to mitigate environmental impacts, restrictions, and costs at Navy training and test range to maximize the availability and utilization of the ranges.

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APPROPRIATION/BUDGET ACTIVITY <b>RDT&amp;E, N / BA-4</b>	PROGRAM ELEMENT NUMBER AND NAME PE0603721N / Environmental Protection	PROJECT NUMBER AND NAME 0817 / Pollution Abatement Ashore
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**B. Accomplishments/Planned Program (Cont.) - EEC-3 Platform Repair & Maintenance with Minimal Environmental Impact**

	FY 06	FY 07	FY 08	FY 09
Maintenance	2.752	4.015	4.235	4.074
RDT&E Articles Quantity				

FY 06: (U) The tasks in this EEC address ship and submarine Fleet and aircraft maintenance operations with the overall objectives of reducing the cost of compliance and mission increasing readiness. Continuing efforts will provide new systems and processes to minimize regulated emissions, discharges and hazardous material usage resulting from the repair and maintenance of ships, submarines, and aircraft. Analysis on acid recycle systems for pipe flushing wastes will identify technology alternatives and allow selection of a candidate system as a pier side integrated system to recycle and reuse of acid/heavy metal wastewater generated in submarine and surface ship pipe flushing operations and submarine missile tube cleaning. The development of an automated convergent spray process for non-skid coatings using 100% solid non-skid coating system will eliminate volatile organic compounds emissions during the application of non-skid on Navy vessels. Dry dock best management practices tool will assist naval shipyards, naval stations, and submarine bases in meeting the copper discharge standards for NPDES and Stormwater discharges. Alternative solvents demonstrations for ship maintenance operations will be conducted to allow development of a decision tool to standardize the approach to HM avoidance across ship and shore activities and identify alternatives for NAVSEA targeted chemicals. A data tool to determine what hazardous materials are consumed and what wastes are generated by ship platform maintenance will allow future pollution prevention efforts to focus on specific chemicals and the operations that use them. Material and component testing will validate high velocity oxygen fuel (HVOF) thermal spray coatings as a cost-effective and technologically superior alternative to the current hard chrome plating used on helicopter dynamic components. The use of HVOF coatings will result in a significant reduction in worker exposure to carcinogenic hexavalent chromium and increase service life of components. The use of low temperature powder coating will help minimize HAP/VOC emissions and the use of hexavalent chromium. Thin film sulfuric acid anodizing (TFSAA) with non-chromated sealers as an alternative to chrome acid anodizing will be evaluated to help the Navy meet the requirements of EO 13148 that requires a 50% reduction in use of hexavalent chromium by 31 Dec. 2006. Zinc-nickel plating will be demonstrated as an acceptable replacement for cadmium plated repairs as a touch-up applications for high-strength steels. This results in the reduction hexavalent chrome used by the Navy. Advanced sealant technologies to replace chromated sealants on static wicks, antennas, floorboards, and windscreen sills with non-hazardous sealants and gaskets will be demonstrated. Validation of a PMB technology to remove coke deposits from the F404 engine drive shaft will result in the elimination of the use of MIL-C-85704, a hazardous air pollutant, used to chemical strip the coke deposits, thereby minimizing a chemical waste stream, reducing record keeping and reducing hazardous material usage. Suitable substitutes for polystyrene/polyester resins and chemical strippers used during repairs to radome will be demonstrated.

FY 07: (U) Continue providing new systems and processes to minimize regulated emissions, discharges and hazardous material usage resulting from the repair and maintenance of ships, submarines, and aircraft. Development of dry dock best management practices and decision selection tool assisting naval shipyards, stations and bases in meeting the copper discharge standards will conclude. Alternative solvents demonstrations for ship maintenance operations and identification of alternatives for NAVSEA targeted chemicals will continue. The development of hazardous material allocation information for ship maintenance will continue. Additional tasks will be initiated that address Fleet maintenance operations with the overall objectives of reducing the cost of compliance and mission increasing readiness. (FY07 continued on next page)

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APPROPRIATION/BUDGET ACTIVITY <b>RDT&amp;E, N / BA-4</b>	PROGRAM ELEMENT NUMBER AND NAME PE0603721N / Environmental Protection	PROJECT NUMBER AND NAME 0817 / Pollution Abatement Ashore
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**B. Accomplishments/Planned Program (Cont.) - EEC-3 Platform Repair & Maintenance with Minimal Environmental Impact**

	FY 06	FY 07	FY 08	FY 09
Aviation Maintenance				
RDT&E Articles Quantity				

FY 07: (U) (continued) Beginning in FY07 the requirements under Project 2210 requirements were rebaselined to Project 0817, Pollution Abatement Ashore. These projects support development and implementation of technologies, which will lead to environmentally safe naval aviation operations and support; compliance with international, federal, state, and local regulation and policies; reduction of increasing compliance costs and personal liability; and enhancement of naval aviation mission readiness and effectiveness. Continuing efforts include investigations into removal coating materials and the use of alternative coatings and plating materials to reduce the amount of hazardous materials used during the repair and maintenance of aircraft. Additional tasks will be initiated that address aircraft maintenance operations with the overall objectives of reducing the cost of compliance and mission increasing readiness. Efforts will also include investigating options to control emissions from tactical vehicle engines such as Jet Air Start Units (JASUs) that provide the compressed air to start jet engines. A new initiative will begin to develop, demonstrate, and transition cost-effective deactivation, demilitarization and disposal (3D) methods for legacy aircraft platforms, engines, and components. Another effort will develop and evaluate materials or processes for repair of powder coatings that will reduce or eliminate the air emissions associated with the current method and reduce labor cost.

FY 08: (U) Continue providing new systems and processes to minimize regulated emissions, discharges and hazardous material usage resulting from the repair and maintenance of ships, submarines, and aircraft. Continued development of hazardous material allocation information for ship maintenance. Additional tasks will be initiated that address Fleet maintenance operations with the overall objectives of reducing the cost of compliance and mission increasing readiness. Continue effort on developing, demonstrating, and transitioning cost-effective deactivation, demilitarization and disposal (3D) methods for legacy aircraft platforms, engines, and components. A new initiative will demonstrate and validate to what extent a Cold Galvanized Coating Systems for Repair Applications repair technology can be successfully utilized in the Fleet to eliminate red rusting of HSS components. Continue to develop and evaluate materials or processes for repair of powder coatings that will reduce or eliminate the air emissions associated with the current method and reduce labor cost. Additional tasks will be initiated that address Fleet maintenance operations with the overall objectives of reducing the cost of compliance and mission increasing readiness.

FY09: (U) Continue providing new systems and processes to minimize regulated emissions, discharges and hazardous material usage resulting from the repair and maintenance of ships, submarines, and aircraft.

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APPROPRIATION/BUDGET ACTIVITY <b>RDT&amp;E, N / BA-4</b>	PROGRAM ELEMENT NUMBER AND NAME PE0603721N / Environmental Protection	PROJECT NUMBER AND NAME 0817 / Pollution Abatement Ashore
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**B. Accomplishments/Planned Program (Cont.) - EEC-4 Support Shore Readiness within Environmental Constraints**

	FY 06	FY 07	FY 08	FY 09
Support Shore Readiness within Environmental Constraints	1.386	1.576	1.157	1.163
RDT&E Articles Quantity				

FY 06: (U) Provide new systems and processes to minimize regulated emissions, discharges and hazardous material usage resulting specifically from waterfront support, aviation support, and other base operations. The demonstration and validation of Improved BMPs- Stormwater Treatment Technology will enhance the management of stormwater run-off and reduce costs while addressing Navy unique requirements and ensuring compliance with stormwater discharge regulations. The development and demonstration of a zinc removal filter for treating collected Compwater will reduce disposal and operation costs and preserve the capability to refuel Naval vessels in port. Optimization of oil-change intervals for DOD vehicles by developing onsite condition monitoring system and implementing better petroleum, oil, and lubricant (POL) products will reduce HW generation and storage and disposal liabilities, reduce labor, material (oil & filter), and disposal costs, increase engine life by ensuring better engine oil quality, predict engine condition and repairs, and improve vehicle reliability and readiness. The identification and qualification of alternative "state of the art" green designer solvents for use in Navy maintenance activity will allow the replacement of cleaners that contain VOCs and HAPs. This will eliminate the use of chemical that are required to be reported under TRI reporting requirements, and minimize costs associated with cleaning operations by reducing environmental compliance costs. The validation of NoFoam systems for AFFF fire suppression tests will eliminate the generation of AFFF wastewater which is of an environmental concern because of high biological oxygen demand (BOD), chemical oxygen demand (COD), extreme foaming action, and which contains perofluoro-octanyl sulfonate (a toxic bioaccumulating compound that does not readily biodegrade). The development of a wastewater treatment system to collect and treat the waste stream for vertical launch missile tubes will improve submarine readiness while reducing the release of hazardous wastes to the environment. An investigation into the feasibility of the onshore treatment of ballast water to control the introduction of aquatic invasive species will provide an assessment tool to manage invasive species and minimize open-water ballast water exchanges. An assessment of drinking water supply security technologies will investigate potable water supply security system methodologies and technologies that are available or under development and assess their applicability to the security of Navy water supplies. An investigation and demonstration is planned to improve biofouling control and preventative maintenance planning to ensure permanent oil containment boom systems meet or exceed their intended 4-year service life.

FY07: (U) Continue providing new systems and processes to minimize regulated emissions, discharges and hazardous material usage resulting specifically from waterfront support, aviation support, and other base operations. Continue selected demonstrations of alternative solvents for industrial operations. Continue demonstration of NoFoam system for fire fighting pumper trucks. Continue the development of a wastewater treatment system to collect and treat the waste stream for vertical launch missile tubes. Initiate effort to determine strategy for use of compliant diesel engines. Continue investigating improved biofouling control and preventative maintenance planning for permanent oil containment boom systems.

FY08: (U) Continue providing new systems and processes to minimize regulated emissions, discharges and hazardous material usage resulting specifically from waterfront support, aviation support, and other base operations. Realign the program to focus on addressing the fleets high priority needs and investment in processes related to waterfront or aviation support.

FY09: (U) Continue providing new systems and processes to minimize regulated emissions, discharges and hazardous material usage resulting specifically from waterfront support and aviation support operations.

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APPROPRIATION/BUDGET ACTIVITY <b>RDT&amp;E, N / BA-4</b>	PROGRAM ELEMENT NUMBER AND NAME PE0603721N / Environmental Protection	PROJECT NUMBER AND NAME 0817 / Pollution Abatement Ashore
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**B. Accomplishments/Planned Program (Cont.) - EEC-5 Cost-Effective Management of Environmental Regulatory Requirements**

	FY 06	FY 07	FY 08	FY 09
Coastal Contamination and Contaminated Sediments	1.446	0.848	0.656	0.611
RDT&E Articles Quantity				

FY 06: (U) Provide validated knowledge, models, processes and system to improve environmental monitoring and reporting, and reduce the cost of compliance with regulations applicable to coastal contamination and contaminated sediments. The identification, review, and demonstration of sediment transport methods and tools that assess physical stability and natural recovery potential at contaminated sediment sites will provide a defined framework that can be used by program mangers and their technical staff to clearly understand the kind of measurements needed at sites and how those measurements can be used to develop management decisions at contaminated sediment sites. The information and data produced by this project will facilitate the identification and use of appropriate and cost-effective technologies and methods for characterizing the behavior of sediment-bound contaminants. This in turn will result in more complete site characterizations, improved evaluation and selection of sediment remedial alternatives in the FS, and potentially more cost-effective cleanups. The results will also facilitate the implementation of more effective long-term monitoring programs for sediment sites. The development of an automated process of capturing radar imagery through the BirdRad unit and transferring the near real-time bird sightings against a backdrop of historical NEXRAD data, base topography, facility maps, and available bird migration patterns aid natural resource managers in monitoring bird activities in and around airfields reducing the cost and saving lives resulting from aircraft striking birds. The assessment of pollutant source tracking technologies will allow the Navy to accurately quantify Navy contaminant loads by identifying, reviewing, demonstrating, and validating contaminant source tracking technologies, which will provide a technical framework for Navy RPMs and environmental managers, enabling them to (1) attribute existing contamination loads to support both IR/Cleanup and Compliance Programs, (2) clearly understand the suite of tracking technologies currently available, their strengths and weaknesses, as well as how those technologies can be used to develop management decisions for IR/Cleanup and Compliance, (3) use this scientific approach and these tools to prevent arbitrary and burdensome regulatory decisions and actions that negatively impact the Navy. The development of a guidance document will provide details of problems and solutions for Navy compliance with the D/DBP Rule and related issues.

FY 07: (U) Continue providing validated knowledge, models, processes and systems to improve environmental monitoring and reporting, and reduce the cost of compliance with regulations applicable to coastal contamination and contaminated sediments. Continue developing containment and monitoring strategies for contaminated sediments. Develop an integrated software system that will allow for more exact location/identification of UXO in sediments, thereby eliminating excess costs of investigating/remediating non-UXO metal anomalies and further reduce safety risks to workers conducting the removals and long-term safety to subsequent users. Ultimately, this will improve the decision-making strategy for prioritizing locations for cleanup both cost effectively and safely. Efficiencies related to aligning the program to the priorities of SEAPOWER 21 and focusing on addressing the fleets high priority needs have resulted in cost saving starting in FY07 and investments in assessment and risk based management of contaminated sediments not associated with range sustainability is concluded in FY07.

FY08: (U) Continue providing validated knowledge, models, processes and system to improve environmental monitoring and reporting, and to reduce the cost of compliance with regulations applicable to coastal contamination and contaminated sediments. Demonstrate the practical application of Compound Specific Isotope Analysis (CSIA) associated with Monitored Natural Attenuation (MNA) to provide practical guidelines associated with its use and interpretation. Continue evaluating pollutant source tracking technologies.

FY09: (U) Continue providing validated knowledge, models, processes and systems to improve environmental monitoring and reporting, and to reduce the cost of compliance with regulations applicable to coastal contamination and contaminated sediments.

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APPROPRIATION/BUDGET ACTIVITY <b>RDT&amp;E, N / BA-4</b>	PROGRAM ELEMENT NUMBER AND NAME PE0603721N / Environmental Protection	PROJECT NUMBER AND NAME 0817 / Pollution Abatement Ashore
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**C. OTHER PROGRAM FUNDING SUMMARY:**

<u>Line Item No. &amp; Name</u>	<u>FY 2006</u>	<u>FY 2007</u>	<u>FY 2008</u>	<u>FY 2009</u>	<u>FY 2010</u>	<u>FY 2011</u>	<u>FY 2012</u>	<u>FY 2013</u>	<u>To Complete</u>	<u>Total Cost</u>
<p>(U) P-1 Procurement Line Item No. &amp; Name. Not Applicable.                      (U) C-1 MILCON Project No. &amp; Name. Not Applicable.                      (U) RELATED RDT&amp;E: This project transitions shoreside pollution abatement technologies from two Navy Science and Technology programs and the Strategic Environmental Research and Development Program (SERDP). Project funding is leveraged by transitioning technologies to the Environmental Security Technology Certification Program (ESTCP) for final certification and by providing funding for Navy participation in ESTCP projects. Execution of this project is coordinated with related Marine Corps, Army, Air Force and NASA programs through direct coordination and active participation in the Joint Group for Pollution Prevention (JG-PP).</p> <p>(U) PE 0602233N, Readiness, Training, and Environmental Quality Technology Development                      (U) PE 0603716D, Strategic Environmental Research &amp; Development Program (SERDP)                      (U) PE 0603851D, Environmental Security Technology Certification Program (ESTCP)</p>										

**D. ACQUISITION STRATEGY:**

(U) This project is categorized as Non-ACAT (Non Acquisition). This project is categorized as Non-ACAT (Non Acquisition). The project delivers a broad spectrum of products that require a variety of acquisition processes to implement. Equipment products for Naval stations and other mission funded activities costing over \$100K are often procured centrally through the Navy Pollution Prevention Equipment Program (PPEP) or directly through the base operating budget. Equipment products for Shipyards and other Navy Working Capital Fund (NWCF) activities costing over \$100K are procured through their Capital Purchases Program (CPP). For both types of activities, equipment products costing less than \$100K, and process changes not requiring the purchase of new equipment such as consumable material or product substitutions, are funded through the activity's operating budgets. Occasionally there is a technology that must be implemented as a specialized facility. These are acquired through the Military Construction (MCON) Program. All these acquisition processes are pursued using a common strategy that satisfies the needs of all the critical stakeholders: 1) Fleet end user; 2) Funding sponsor for the Navy end user; 3) Other stakeholders with cognizance over the Navy process or operation being changed, 4) Cognizant environmental federal, state, and local regulators; and 5) The private or government organization that will produce the product.

**D. MAJOR PERFORMERS:**

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Exhibit R-3 Cost Analysis (page 1)	DATE: <b>February 2007</b>
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APPROPRIATION/BUDGET ACTIVITY		PROGRAM ELEMENT				PROJECT NUMBER AND NAME								
<b>RDT&amp;E, N / BA-4</b>		PE0603721N / Environmental Protection				0817 / Pollution Abatement Ashore								
Cost Categories	Contract Method & Type	Performing Activity & Location	Total PY s Cost	FY 06 Cost	FY 06 Award Date	FY 07 Cost	FY 07 Award Date	FY 08 Cost	FY 08 Award Date	FY 09 Cost	FY 09 Award Date	Cost to Complete	Total Cost	Target Value of Contract
EEC 2	WR/PO	NFESC	1.548	1.160	varies	1.888	varies	1.883	varies	1.963	varies	Continuing	Continuing	N/A
EEC 2	WR/PO	SSC/SD	0.252	0.527	varies	0.568	varies	0.754	varies	0.761	varies	Continuing	Continuing	N/A
EEC 2	WR/PO	NSWC/IH	15.666	0.000		0.000		0.251	varies	0.305	varies	Continuing	Continuing	N/A
EEC 3	WR/PO	NFESC	10.859	1.396	varies	1.724	varies	1.368	varies	1.276	varies	Continuing	Continuing	N/A
EEC 3	WR/PO	NSWC/CD	5.971	0.506	varies	0.797	varies	1.358	varies	1.272	varies	Continuing	Continuing	N/A
EEC 3	WR/PO	NAWC PAX	0.815	0.850	varies	1.494	varies	1.509	varies	1.526	varies	Continuing	Continuing	N/A
EEC 4	WR/PO	NFESC	17.700	1.386	varies	1.476	varies	1.031	varies	1.030	varies	Continuing	Continuing	N/A
EEC 4	WR/PO	SSC/SD	0.000	0.000		0.100	varies	0.126	varies	0.133	varies	Continuing	Continuing	N/A
EEC 5	WR/PO	NFESC	2.635	0.903	varies	0.624	varies	0.479	varies	0.458	varies	Continuing	Continuing	N/A
EEC 5	WR/PO	SSC/SD	2.931	0.543	varies	0.224	varies	0.177	varies	0.153	varies	Continuing	Continuing	N/A
Subtotal Product Development			58.377	7.271		8.895		8.936		8.877				

Remarks:  
 (U) Performing Activities: Naval Surface Warfare Center, Carderock Division (NSWC/CD), Naval Facilities Engineering Service Center (NFESC), Naval Surface Warfare Center, Indian Head Division (NSWC/IH), Space and Warfare Systems Center, San Diego (SSC/SC), Naval Research Laboratory (NRL), Naval Air Warfare Center, Patuxent River (NAWC PAX)  
 (U) Total Prior Years Cost: Summation starts with FY80. Subtotal does not include performing activities from prior years that are no longer performing activities.  
 (U) Award Dates: About 55% of the project is executed via contracts awarded by the performing activities.

Development Support														0.000
Software Development														0.000
Training Development														0.000
Integrated Logistics Support														0.000
Configuration Management														0.000
Technical Data														0.000
GFE														0.000
Award Fees														0.000
Subtotal Support			0.000	0.000		0.000		0.000		0.000		0.000	0.000	0.000

Remarks: (U) Included in Product Development costs.

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Exhibit R-3 Cost Analysis (page 2)										DATE: <b>February 2007</b>				
APPROPRIATION/BUDGET ACTIVITY			PROGRAM ELEMENT				PROJECT NUMBER AND NAME							
<b>RDT&amp;E, N / BA-4</b>			PE0603721N / Environmental Protection				0817 / Pollution Abatement Ashore							
Cost Categories	Contract Method & Type	Performing Activity & Location	Total PY s Cost	FY 06 Cost	FY 06 Award Date	FY 07 Cost	FY 07 Award Date	FY 08 Cost	FY 08 Award Date	FY 09 Cost	FY 09 Award Date	Cost to Complete	Total Cost	Target Value of Contract
Developmental Test & Evaluation													0.000	
Operational Test & Evaluation													0.000	
Live Fire Test & Evaluation													0.000	
Test Assets													0.000	
Tooling													0.000	
GFE													0.000	
Award Fees													0.000	
Subtotal T&E			0.000	0.000		0.000		0.000		0.000		0.000	0.000	
Remarks: Not applicable.														
Contractor Engineering Support													0.000	
Government Engineering Support													0.000	
Program Management Support													0.000	
Travel													0.000	
Labor (Research Personnel)													0.000	
SBIR Assessment													0.000	
Subtotal Management			0.000	0.000		0.000		0.000		0.000		0.000	0.000	
Remarks: Not applicable.														
Total Cost			58.377	7.271		8.895		8.936		8.877		0.000		
Remarks:														

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EXHIBIT R4, Schedule Profile																				DATE: <b>February 2007</b>												
APPROPRIATION/BUDGET ACTIVITY <b>RDT&amp;E, N / BA-4</b>					PROGRAM ELEMENT NUMBER AND NAME PE0603721N / Environmental Protection										PROJECT NUMBER AND NAME 0817 / Pollution Abatement																	
Fiscal Year	2006				2007				2008				2009				2010				2011				2012				2013			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
EEC 2: Maximize training and Testing Requirements within Environmental Constraints	[Redacted]																															
EEC 3: Platform Repair and Maintenance with Minimal Environmental Impact	[Redacted]																															
EEC 4: Support Shore Readiness within Environmental Constraints	[Redacted]																															
EEC 5: Coast Effective Management of Environmental Regulatory Requirements	[Redacted]																															

# UNCLASSIFIED

EXHIBIT R-2a, RDT&E Project Justification							DATE: <b>February 2007</b>	
APPROPRIATION/BUDGET ACTIVITY <b>RDT&amp;E, N / BA-4</b>		PROGRAM ELEMENT NUMBER AND NAME PE0603721N / Environmental Protection			PROJECT NUMBER AND NAME 9204 / Marine Mammal Research			
COST (\$ in Millions)	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013
Project Cost	4.345	4.247	4.336	4.384	4.429	4.476	4.559	4.645
RDT&E Articles Qty								

**A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION:**

(U) The Navy has been and will continue to be subject to litigation with regard to the potential injuring and killing of marine animals by the use of intense underwater sound. Since Fleet operation and training areas coincide with known or probable marine mammal habitats, migration routes, or breeding areas, the possibility exists that such incidents are likely to continue in the future. The increasing public interest and pressure has resulted in escalating Fleet costs. For example, Fleet and SYSCOM development activities have been interrupted, modified, or altogether cancelled and environmental regulations have, among other things, required new ship construction shock trials to obtain Federal permits and conduct extensive environmental planning that can take several years to complete. The incorporation of mitigation measures in Fleet training operations to minimize the potential adverse effects on protected marine animals can significantly reduce the realism of these operations. In addition, the testing, evaluation, and deployment of new sonar detection and monitoring systems that use active acoustics are under severe public scrutiny for their potential adverse effects on whales and other marine animals. Navy needs scientific evidence to substantiate its claims of limited or inconsequential adverse effects to marine life from operations.

(U) This program primarily focuses on the development of planning and monitoring tools to aid the Fleet in minimizing contact with and the potential harassment of protected marine animals during operations, exercises, training, and undersea surveillance and weapons testing. These new capabilities will encompass historical and newly acquired data and analytical models that together can predict marine animal habitats (where they are likely to be) and their natural and expected behavior (diving patterns, prey localization, calling activity, etc.).

(U) Accurate and timely monitoring and predicting the movement of whales and other protected marine animals plus an enhanced knowledge of how marine animals may react to Fleet activities (e.g., hearing and behavioral effects) will reduce Navy interaction with these animals; minimize the risk that legally-imposed monitoring and avoidance measures will adversely affect Fleet operations and exercises; minimize the substantial costs associated with operations, exercises, and tests that have to be modified or curtailed as a result of concerns about protected marine animals; and will reduce the likelihood of litigation related to actual or anticipated compliance problems with protected animals.

# UNCLASSIFIED

EXHIBIT R-2a, RDT&E Project Justification	DATE: <b>February 2007</b>
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APPROPRIATION/BUDGET ACTIVITY <b>RDT&amp;E, N / BA-4</b>	PROGRAM ELEMENT NUMBER AND NAME PE0603721N / Environmental Protection	PROJECT NUMBER AND NAME 9204 / Marine Mammal Research
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**B. Accomplishments/Planned Program**

	FY 06	FY 07	FY 08	FY 09
Marine Mammal Location, Abundance and Movement	1.754	1.818	1.500	1.670

**FY 06:** (U) Initiate investigation in marine mammal location, abundance, and movement through habitat investigations; predictive models; marine mammal database; and data analysis, protocols and surveys.

**FY 07:** (U) Continue investigations in marine mammal location, abundance, and movement through habitat investigations; predictive models; marine mammal database; and data analysis, protocols and surveys.

**FY08:** (U) Continue investigations in marine mammal location, abundance, and movement through habitat investigations; predictive models; marine mammal database; and data analysis, protocols and surveys.

**FY09:** (U) Continue investigations in marine mammal location, abundance, and movement through habitat investigations; predictive models; marine mammal database; and data analysis, protocols and surveys.

	FY 06	FY 07	FY 08	FY 09
Criteria and Thresholds, Physiology and Behavior, and Effects of Sound	0.975	0.861	1.158	1.200

**FY 06:** (U) Initiate investigation in criteria and thresholds, physiology and behavior, and effects of sound through hearing sensitivity; temporary threshold shift (TTS)/Sub-TTS; physical injury models; cumulative effects of sound and/or multiple events; effects of sound on the marine mammal habitat; and workshops.

**FY 07:** (U) Continue investigations in criteria and thresholds, physiology and behavior, and effects of sound through hearing sensitivity; temporary threshold shift (TTS)/Sub-TTS; physical injury models; cumulative effects of sound and/or multiple events; effects of sound on the marine mammal habitat; and workshops.

**FY08:** (U) Continue investigations in criteria and thresholds, physiology and behavior, and effects of sound through hearing sensitivity; temporary threshold shift (TTS)/Sub-TTS; physical injury models; cumulative effects of sound and/or multiple events; effects of sound on the marine mammal habitat; and workshops.

**FY09:** (U) Continue investigations in criteria and thresholds, physiology and behavior, and effects of sound through hearing sensitivity; temporary threshold shift (TTS)/Sub-TTS; physical injury models; cumulative effects of sound and/or multiple events; effects of sound on the marine mammal habitat; and workshops.

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EXHIBIT R-2a, RDT&E Project Justification	DATE: <b>February 2007</b>
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APPROPRIATION/BUDGET ACTIVITY <b>RDT&amp;E, N / BA-4</b>	PROGRAM ELEMENT NUMBER AND NAME PE0603721N / Environmental Protection	PROJECT NUMBER AND NAME 9204 / Marine Mammal Research
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**B. Accomplishments/Planned Program**

	FY 06	FY 07	FY 08	FY 09
Mitigation Methodologies: Monitoring, New Technology, and Risk Assessment	1.516	1.418	1.500	1.400

**FY 06:** (U) Initiate mitigation methodologies for monitoring, new technology and risk assessment through passive acoustic monitoring; active acoustic monitoring; improved tag development; alternative monitoring; defining risk assessment variables; model risk assessment and determine mitigation effectiveness.

**FY 07:** (U) Continue mitigation methodologies for monitoring, new technology and risk assessment through passive acoustic monitoring; active acoustic monitoring; improved tag development; alternative monitoring; defining risk assessment variables; model risk assessment and determine mitigation effectiveness.

**FY08:** (U) Continue mitigation methodologies for monitoring, new technology and risk assessment through passive acoustic monitoring; active acoustic monitoring; improved tag development; alternative monitoring; defining risk assessment variables; model risk assessment and determine mitigation effectiveness.

**FY09:** (U) Continue mitigation methodologies for monitoring, new technology and risk assessment through passive acoustic monitoring; active acoustic monitoring; improved tag development; alternative monitoring; defining risk assessment variables; model risk assessment and determine mitigation effectiveness.

	FY 06	FY 07	FY 08	FY 09
Acoustic Source Propagation	0.100	0.150	0.178	0.114

**FY 06:** (U) Initiate investigation of acoustic source propagation through 3-D modeling of multiple acoustic sources.

**FY 07:** (U) Continue investigation of acoustic source propagation through 3-D modeling of multiple acoustic sources.

**FY08:** (U) Continue investigation of acoustic source propagation through 3-D modeling of multiple acoustic sources.

**FY09:** (U) Continue investigation of acoustic source propagation through 3-D modeling of multiple acoustic sources.

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EXHIBIT R-2a, RDT&E Project Justification	DATE: <b>February 2007</b>
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APPROPRIATION/BUDGET ACTIVITY <b>RDT&amp;E, N / BA-4</b>	PROGRAM ELEMENT NUMBER AND NAME PE0603721N / Environmental Protection	PROJECT NUMBER AND NAME 9204 / Marine Mammal Research
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**C. OTHER PROGRAM FUNDING SUMMARY:**

<u>Line Item No. &amp; Name</u>	<u>FY 2006</u>	<u>FY 2007</u>	<u>FY 2008</u>	<u>FY 2009</u>	<u>FY 2010</u>	<u>FY 2011</u>	<u>FY 2012</u>	<u>FY 2013</u>	<u>To Complete</u>	<u>Total Cost</u>
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- (U) Related RDT&E: Office of Naval Research (PE 601153 / PE 602435 / PE 602782 / PE 603235)
- (U) Related RDT&E: Strategic Environmental Research & Development Program (SERDP)
- (U) Related RDT&E: National Oceanographic Partnership Program (NOPP)

**D. ACQUISITION STRATEGY:**

- (U) RDT&E Contracts are Competitive Procurements.

**D. MAJOR PERFORMERS:**

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Exhibit R-3 Cost Analysis (page 1)										DATE: February 2007				
APPROPRIATION/BUDGET ACTIVITY			PROGRAM ELEMENT			PROJECT NUMBER AND NAME								
<b>RDT&amp;E, N / BA-4</b>			PE0603721N / Environmental Protection			9204 / Marine Mammal Research								
Cost Categories	Contract Method & Type	Performing Activity & Location	Total PY s Cost	FY 06 Cost	FY 06 Award Date	FY 07 Cost	FY 07 Award Date	FY 08 Cost	FY 08 Award Date	FY 09 Cost	FY 09 Award Date	Cost to Complete	Total Cost	Target Value of Contract
Primary Hardware Development														
Primary Hardware Development														
Primary Hardware Development														
Primary Hardware Development														
Primary Hardware Development														
Primary Hardware Development														
Ancillary Hardware Development														
Component Development														
Ship Integration														
Ship Suitability														
Systems Engineering														
Training Development														
Licenses														
Tooling														
GFE														
Award Fees														
Subtotal Product Development			0.000	0.000		0.000		0.000		0.000				
Remarks:														
Development Support														
Software Development														
Training Development														
Integrated Logistics Support														
Configuration Management														
Technical Data														
GFE														
Award Fees														
Subtotal Support			0.000	0.000		0.000		0.000		0.000				
Remarks:														

**UNCLASSIFIED**

Exhibit R-3 Cost Analysis (page 2)										DATE: February 2007				
APPROPRIATION/BUDGET ACTIVITY			PROGRAM ELEMENT				PROJECT NUMBER AND NAME							
RDT&E, N / BA-4			PE0603721N / Environmental Protection				9204 / Marine Mammal Research							
Cost Categories	Contract Method & Type	Performing Activity & Location	Total PY s Cost	FY 06 Cost	FY 06 Award Date	FY 07 Cost	FY 07 Award Date	FY 08 Cost	FY 08 Award Date	FY 09 Cost	FY 09 Award Date	Cost to Complete	Total Cost	Target Value of Contract
Developmental Test & Evaluation	WX	NUWC		0.450		0.400		0.400		0.400				
Developmental Test & Evaluation	WX	NPGS, Monterey, CA		0.450		0.400		0.400		0.400				
Developmental Test & Evaluation	MIPR	NOAA, Fish Science Center		0.490		0.500		0.500		0.500				
Developmental Test & Evaluation	CPFF	Misc Contracts		0.213		0.147		0.236		0.284				
Developmental Test & Evaluation	CPFF	Scripps Institute		1.942		1.000		1.000		1.000				
Developmental Test & Evaluation	CPFF	U of Wash, APL		0.200		0.200		0.200		0.200				
Developmental Test & Evaluation	CPFF	Duke Univ.		0.425		0.400		0.400		0.400				
Developmental Test & Evaluation	CPFF	Oregon State Univ.		0.175		0.200		0.200		0.200				
Developmental Test & Evaluation	CPFF	University of Maryland				0.500								
Developmental Test & Evaluation	CPFF	Woods Hole Oceanographic Inst				0.500		1.000		1.000				
Operational Test & Evaluation														
Live Fire Test & Evaluation														
Test Assets														
Tooling														
GFE														
Award Fees														
Subtotal T&E			0.000	4.345		4.247		4.336		4.384				
Remarks:														
Contractor Engineering Support														
Government Engineering Support														
Program Management Support														
Travel														
Labor (Research Personnel)														
SBIR Assessment														
Subtotal Management			0.000	0.000		0.000		0.000		0.000				
Remarks:														
Total Cost			0.000	4.345		4.247		4.336		4.384				
Remarks:														

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EXHIBIT R4, Schedule Profile																			DATE: <b>February 2007</b>															
APPROPRIATION/BUDGET ACTIVITY <b>RD&amp;E, N / BA-4</b>					PROGRAM ELEMENT NUMBER AND NAME PE0603721N / Environmental Protection												PROJECT NUMBER AND NAME 9204 / Marine Mammal Research																	
Fiscal Year	2006				2007				2008				2009				2010				2011				2012				2013					
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4		
Marine Mammal Location, Abundance, and Movement																																		
Criteria and Thresholds, Physiology and Behavior, and Effects of Sound																																		
Mitigation Methodologies: Monitoring, New Technology, and Risk Assessment																																		
Acoustic Source Propagation																																		

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**CLASSIFICATION:**

EXHIBIT R-2a, RDT&E Project Justification	DATE: <b>February 2007</b>
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APPROPRIATION/BUDGET ACTIVITY <b>RDT&amp;E, N / BA-4</b>	PROGRAM ELEMENT NUMBER AND NAME PE0603721N / Environmental Protection	PROJECT NUMBER AND NAME Project Unit (PU) No. and Name: Congressional Plus-Ups: VARIOUS
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**CONGRESSIONAL PLUS-UPS:**

	FY 06	FY 07	FY 08	FY 09
9204C				
Integrated Marine Mammal Monitoring and Protection	1.449	1.793		

(U) This Congressional Add is a continuation of Congressional Add Project 9204. This effort involves the development and testing of an Integrated Marine Mammal Monitoring and Protection System (IMAPS), which integrates an Active/Passive Sonar System with the Mitigation Management and Control Module (MMCM). The active/passive acoustic system will act as the primary detection method, while the MMCM will act to optimize the functional settings of the active/passive system to maximize the probability of detection of marine mammals for the given operation. This system will be evaluated for its ability to track gray whales and other marine mammals of special interest to the Navy.

	FY 06	FY 07	FY 08	FY 09
9536C				
Puget Sound Anoxia Research	1.739	1.992		

(U) This Congressional Add is a continuation of Congressional Add Project 9536. This effort will involve the monitoring of the oxygen content of the water in Hood Canal and streams throughout the watershed and will increase understanding of the long-term effects of low-oxygen levels on sealife. The monitoring information will be used to develop a mathematical model of Hood Canal. The model will be used to evaluate the effect of different potential sources of input to Hood Canal that might account for an existing anoxic condition.

	FY 06	FY 07	FY 08	FY 09
9765N				
Coatings and Polymeric Films Development for Naval Applications	2.031			

(U) This Congressional Add is a continuation of a Congressional Add previously managed by ONR. This effort will involve the development of coatings and polymeric films from bio-based polymers for application to Naval vessels.

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**CLASSIFICATION:**

EXHIBIT R-2a, RDT&E Project Justification		DATE: <b>February 2007</b>
APPROPRIATION/BUDGET ACTIVITY <b>RDT&amp;E, N / BA-4</b>	PROGRAM ELEMENT NUMBER AND NAME PE0603721N / Environmental Protection	PROJECT NUMBER AND NAME Project Unit (PU) No. and Name: Congressional Plus-Ups: VARIOUS

**CONGRESSIONAL PLUS-UPS:**

	FY 06			
9537C				
Invasive Species Eradication Program	0.480			

(U) This Congressional Add is a continuation of Congressional Add Project 9537. This effort involves: (1) testing the relative efficacy of toxicants and trapping programs for brown tree snakes (BTS) in both long-term controlled landscapes and previously uncontrolled landscapes; (2) evaluating the size distribution of snakes controlled by toxicants and trapping. Efforts help prevent BTS from reaching other topical islands and the United States Mainland by reducing BTS populations around Navy cargo and port facilities.

	FY 06	FY07		
9A10N				
Marine Mammal Budget Plus-up		1.992		

(U) This Congressional Add is to the Project 9204 Budget. This effort involves: (1) The integration of several technologies in large-scale ocean experiments designed to observe, measure and analyze the effect of mid-frequency sonar type signals on the behavior of marine mammals. Several variables have to be considered, such as an initial understanding of "normal" behavior in different ocean environments and in different marine mammal habitat conditions. Behavior encompasses such things as feeding, breeding, nursing, migration, calling etc. (2) Applying the most advanced finite element (analytical) computer modeling techniques to simulate the effect of various types of sonar signals on marine mammal physiology, organs, tissue etc. This is the only method available to investigate and determine the potential of physical damage to marine mammals from intense sound that does not require destructive testing on real animals, which is prohibited. The initial task in this effort involves translating all the dissected small marine mammal body parts into physical variables such as: density, shear modulus, elasticity etc. The ultimate goal in this rigorous process is to convert normal scaling from electronic scans (MRI, MRA cat scan etc) into these required physical variables that will be used in the analytical models. (3) Testing the feasibility of using the Navy's complex undersea training ranges to detect, classify, track and monitor marine animals that are within the range. An initial determination as to what animals are likely to "call" and under what circumstances must first be addressed. The ultimate goal is to use existing range sensors to measure any "abnormal" marine mammal behavior and relate it to any man-made influence such as commercial shipping, oil and gas exploration, Navy sonar activity etc. (4) Determining the habitat of several threatened species of marine mammals by correlating physical ocean conditions with the expectation of the development of a food source or other conditions which will attract marine mammals and change the average normal population densities. (5) The continued development of instrumentation to uniquely study the natural behavior of beaked whales, that seem to be most vulnerable to Navy sonar type signals. Deployment of these instruments along with the use of other ancillary ocean data collection devices to first determine the natural behavior of these whales and then to observe, measure and analyze changes to this normal behavior because of some outside influence such as shipping, underwater sound, distant undersea explosives etc.

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