Exhibit R-2, RDT&E Budget Item Justification							Date: February 2005	
Appropriation/Budget Activity RDT&E. Defense-Wide BA3				R-1 Item Nomenclature: Strategic Environmental Research and Development Program (SERDP) PE 0603716D8Z				
Cost ($ in millions)	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
Total PE 0603716D8Z Cost	49.002	56.597	64.101	66.104	69.799	69.864	71.191	72.722
SERDP P470	49.002	56.597	64.101	66.104	69.799	69.864	71.191	72.722

A. Mission Description and Budget Item Justification:

(U) Congress established the Strategic Environmental Research and Development Program (SERDP) in 1990 (10 U.S.C. Section 2901-2904) to address Department of Defense (DoD) and Department of Energy (DOE) environmental concerns. It is conducted as a DoD program, jointly planned and executed by the DoD, DOE, and the Environmental Protection Agency (EPA), with strong participation by other Federal agencies, industry, and academia. SERDP`s objective is to improve DoD mission readiness by providing new knowledge, cost-effective technologies, and demonstrations in the areas of environmental Cleanup, Unexploded Ordnance (UXO), Compliance, Conservation, and Pollution Prevention. SERDP does this by (1) addressing high priority, mission-relevant, defense environmental technology needs necessary to enhance military operations, improve military systems` effectiveness, enhance military training/readiness, sustain DoD's training and testing range infrastructure, and help ensure the safety and welfare of military personnel and their dependents; and (2) enhancing pollution prevention capabilities to reduce operational and life-cycle costs, as well as reducing the cost of necessary cleanup actions and compliance with laws and regulations. As a secondary benefit, SERDP helps solve significant national and international environmental problems. The keys to a growing list of SERDP technological successes are the ability to respond aggressively to these priority defense needs; the pursuit of universal, world-class technical excellence; emphasis on constant technology transfer to field use; and sound fiscal management. The apparent increase between FY 2004 and FY 2005 represents a return to historical levels in prior years' requests. The increase between FY 2005 and FY 2006 and similarly FY 2006 and FY 2007 represents an increased investment in technologies for the detection, discrimination and disposal of unexploded ordnance (UXO).

B. Program Change Summary:

	FY 2004	FY 2005	FY 2006	FY 2007
Previous President's Budget	49.883	56.936	60.358	61.189
Current FY 2006 President's Budget	49.002	56.597	64.101	66.104
Adjustments to Appropriated Value:	-0.881	-0.339	+3.743	+4.915
Congressional Program Reductions:				
Congressional Rescissions:				
Congressional Increases:	+3.550	+1.000		
Reprogrammings:	-3.849	-0.716		
SBIR/STTR Transfers:	-0.582	-0.623		
Program Increases			+3.743	+4.915

C. Other Program Funding Summary: NA

D. Acquisition Strategy. N/A

E. Performance Metrics: Performance in this program is monitored at two levels. At the lowest level, each of the more than 120 individual projects is measured against both technical and financial milestones on a quarterly and annual basis. At a program-wide level, progress is measured against DoD's environmental requirements and the development of technologies that address these requirements as well as the transition of these technologies to either to demonstration and validation programs or to direct use in the field.

Exhibit R-2a, RDT&E Project Justification							Date: February 2005	
Appropriation/Budget Activity RDT&E. Defense-wide BA 3				Strategic Environmental Research and Development Program (SERDP) PE 0603716D8Z				
Cost ($ in millions)	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
SERDP P470	49.002	56.597	64.101	66.104	69.799	69.864	71.191	72.722

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B. Accomplishments/Planned Program

Unexploded Ordnance	FY 2004	FY 2005	FY 2006	FY 2007
Accomplishment/ Effort/Subtotal Cost	10.826	12.651	17.345	17.887

(U) FY 2004 Accomplishments**:** Unexploded Ordnance (UXO):

Investment in UXO yielded advanced technology to address the most difficult and persistent issues facing our military testing and training lands, ranging from advanced signal processing approaches for improved detection and discrimination to next generation sensors to UXO filler material identification methods to underwater characterization technologies. Investigators continued to use the two standardized test sites for the demonstration and evaluation of UXO technologies. New start projects concentrated on improved sensor designs and detection and discrimination methods.

(U) FY 2005 Plans**:** UXO: Continuing efforts in UXO detection and discrimination technologies, projects include developing navigation tools to support collection of geophysical data, characterizing underwater sites, and developing novel sensors and signal processing techniques.

(U) FY 2006 Plans**:** UXO: New initiatives will continue to focus on wide area assessment technologies, advanced sensors, signal processing, supporting technologies and protocols. Continuing efforts include a project to develop model-based, robust methods for UXO discrimination from time and frequency domain Electromagnetic Induction.

(U) FY 2007 Plans**:** UXO: Research initiatives will focus on advancements in wide area assessment technologies, advanced sensors, signal processing, supporting technologies and protocols to reduce the costs associated with detecting UXO. New start initiatives will center on cost effective remediation technologies.

Cleanup	FY 2004	FY 2005	FY 2006	FY 2007
Accomplishment/ Effort/Subtotal Cost	9. 686	11.319	12.066	12.443

(U) FY 2004 Accomplishments: Cleanup

In FY 2004 SERDP-funded research continued to address two major contaminants of concern at DoD facilities: munitions constituents (explosives, propellants and pyrotechnics) found on ranges; and chlorinated solvents (TCE, PCE) found at over half of DoD sites. Significant progress was made in the investigation of the genetic and biochemical processes involved in the breakdown of explosive contaminants by plants. Researchers continued to develop both biological and abiotic technologies to address the remediation of munitions constituents in soil and groundwater and development of technologies to remediate chlorinated solvent plumes with in-situ alternatives to decades-long “pump and treat” solutions. Other continuing projects researched source zone delineation and the sequestration of toxic heavy metals in soils, such as lead on small arms ranges. Work was initiated in FY 2004 to investigate the in-place remediation of contaminated sediments, identify remediation strategies for groundwater contaminated with heavy metals, and develop low cost methods of measuring hydraulic conductivity.

(U) FY 2005 Plans: Cleanup:

Efforts will continue in the munitions constituents on ranges and chlorinated solvents areas. Projects initiated in FY 2005 will: 1) investigate cost-effective remediation strategies for new emerging contaminants in soil and groundwater; 2) improve risk assessments at DoD sites with ecological soil screening levels and wildlife toxicity reference values; 3) develop technologies to perform screening level risk assessments of energetics contaminated soil and groundwater; 4) better understand the scientific principles behind the thermal treatment of contaminants.

(U) FY 2006 Plans: Cleanup:

SERDP will aim to improve scientific understanding and develop innovative cost effective methods for the bioremediation of munitions constituents, specifically energetics and nitroaromatic compounds. Work will also focus on the in-place management of contaminated sediments. Additional initiatives will continue work in the areas of source-zone treatment of dense non-aqueous phase liquids, and the phytoremediation of energetic contaminants.

(U) FY 2007 Plans**:** Cleanup:

New initiatives will focus on the remediation of energetics and other contaminants found on testing/training ranges, management of contaminated sediments, and the identification and characterization of new emerging contaminants.

Conservation	FY 2004	FY 2005	FY 2006	FY 2007
Accomplishment/ Effort/Subtotal Cost	9.117	10.654	11.312	11.665

(U) FY 2004 Accomplishments: Conservation:
Completed two initiatives under the SERDP Ecosystem Management Project (SEMP) – understanding ecosystem disturbance thresholds and ecosystem indicators of change. Continued to develop land management techniques for installations and ranges. Completed efforts to use hyperspectral imagery to rapidly and inexpensively map invasive plant species on military lands, and developed a strategy to control, monitor, and predict invasive species in Western states. Completed a sensor fusion approach to assess and characterize archaeological artifacts in DoD installations and ranges. Evaluated the impacts of training noise on the endangered Red Cockaded Woodpecker and on marine mammals. Commenced planning for an estuarine and coastal research land/resources management initiative at Camp LeJeune to address impacts of military training operations in these environments.

(U) FY 2005 Plans: Conservation:
Ecosystem management techniques for installations and ranges continue to dominate SERDP Conservation research. Sustaining use of military ranges requires SERDP to continue efforts on developing cost effective quantification of impact of military operations on Threatened and Endangered Species, prediction of marine mammal distribution, and cost effective control of invasive species on ranges. Continuing efforts to understand and manage invasive plant species that negatively affect training activities; predicting marine mammal population densities; characterizing military activities that contribute to the transport of non-indigenous species; monitoring migratory bird species on military lands; and developing remote sensing technologies to identify threatened/endangered species habitats to meet requirements of the Endangered Species Act and Migratory Bird Treaty Act. New initiatives will commence to determine the fundamental relationships that define migratory land bird habitat and routes; and to understand how these elements can lead to improved monitoring strategies; develop models for biogeochemical cycles that can assist land managers in determining appropriate land uses and land management approaches for ecosystems; and develop new remote sensing technologies to detect high priority threatened and endangered species (TES) and their habitat(s) on DoD lands. A research strategy and plan will be developed for the Defense Coastal and Estuarine Research Program at Camp LeJeune.

(U) FY 2006 Plans: Conservation: SERDP will continue and initiate new efforts to address persistent issues that severely impact installation readiness and their ability to support force training and testing. Research topics include an assessment of the stressors on military lands caused by future larger/centralized force structures; developing scientific, defensible threatened and endangered species population viability and recovery goals for installations and their surrounding areas; and the development of methods to evaluate land parcels around military installations that are candidates for acquisition to combat encroahcment. Establish the Defense Coastal and Estuarine Research Program at Camp LeJeune.

(U) FY 2007 Plans: Conservation: SERDP will expand the long-term research efforts at the Defense Coastal and Estuarine Research Program at Camp LeJeune into full scale operation. Continue efforts to assess stressors on military lands caused by future force structures; developing scientific, defensible threatened and endangered species population goals for installations and surrounding areas; and develop tools to manage biodiversity fragmentation caused by encroachment around military installations.

Compliance	FY 2004	FY 2005	FY 2006	FY 2007
Accomplishment/ Effort/Subtotal Cost	8.547	9.988	10.558	10.888

(U) FY 2004 Accomplishments**:** Compliance:
Continued efforts to determine the levels of explosives contamination on training and testing ranges and continued studies that determine the fate and transport of these materials into the soil and groundwater at training ranges. Completed a study to assess the fate, transport and ecotoxocological issues of CL-20, considered a new energetic materials candidate. New technologies to measure and characterize fine particulate matter in the air from military systems were successfully concluded and will permit the Department to comply with emerging EPA regulations. Developed technologies for estimating the impact of DoD activities on marine estuaries and technologies to control invasive aquatic species in Navy ships. New projects were initiated to develop technologies to measure and predict noise impacts, and to develop dust emissions factors from military activities.

(U) FY 2005 Plans: Compliance:
Continue to develop technologies needed to support the sustainability of DoD's training and testing ranges with specific attention on fate and effect of munitions constituents from operational ranges. Characterize the source term of energetic compounds in aquatic environments. Continue to develop emissions factors for dust generated by unique military activities, air toxic emissions factors for military aircraft engines, and technologies for the measurement and control of air emissions from tactical vehicles. Continue to assess the impact of military noise sources and begin innovative monitoring systems for impulse noise. New initiatives identify and quantify naturally occurring sources of perchlorate and develop new, cost-effective methods for the treatment of perchlorate in drinking water.

(U) FY 2006 Plans: Compliance:
Future initiatives that will be funded to ensure the continued use and sustainability of our training ranges include exposure assessments of the fate and transport of energetic materials, and screening level and modeling tools. The knowledge of the potential sources, the movement of residual energetic materials and/or their breakdown products, and the assessment of environmental exposure will assist in total assessment of potential environmental impacts stemming from the use of test and training ranges. Solicit technologies to safely and effectively dispose of composite materials that come about as a result of manufacturing and repair processes at military depots.

(U) FY 2007 Plans: Compliance:
Research initiatives will continue to focus on the sustainability of our training ranges including screening level tools and detailed range management models that minimize impacts to the environment while maximizing training capabilities. Invest in technologies to

safely and effectively recycle or dispose of next generation materials produced by manufacturing and repair processes at military depots.

Pollution Prevention	FY 2004	FY 2005	FY 2006	FY 2007
Accomplishment/ Effort/Subtotal Cost	10.826	11.985	12.820	13.221

(U) FY 2004 Accomplishments: Pollution Prevention:
Continued development efforts in green munitions for medium caliber munitions and environmentally benign ammonium perchlorate replacements in pyrotechnics. Successfully identified options to eliminate or reduce the use and associated emissions of carcinogenic chromium - from novel polymers for corrosion protection to a chromate-free dry-coating technology. Identified options to further reduce particulate matter emissions in diesel and gas turbine engines. Completed projects to develop environmentally benign polymer matrix composites and cleaning solvents for precision and hand-wipe applications. Initiated projects to develop green alternatives to ammonium perchlorate for propulsion purposes and develop an environmentally green synthesis of TNT for the elimination of red water.

(U) FY 2005 Plans: Pollution Prevention:
New and continuing efforts will focus on eliminating hazardous “red water” from explosives (TNT) manufacturing, cadmium plating on high-strength steels, and solvents containing Class II ozone depleting substances. Alternatives to perchlorate in incendiary mixes and pyrotechnic formulations; Hazardous Air Pollutant (HAP)-free solvents, and environmentally benign “green” gun barrels for medium caliber weapons will continue.

(U) FY 2006 Plans: Pollution Prevention:
The P2 program will focus on development of “green” energetics, munitions and weapons systems components that have little impact on the environment. Other initiatives include a coating system for military aircraft and land based platforms that eliminates volatile organic compounds, chromium constituents, and associated hazardous air pollutants systems.

(U) FY 2007 Plans: Pollution Prevention:
The P2 program will continue to focus on development of “green” energetics, munitions and weapons systems components as well as innovative life-cycle-based coating systems for military aircraft and land based platforms that eliminates volatile organic compounds, heavy metal constituents, and associated hazardous air pollutants. New initiatives to reduce or eliminate compounds on the Toxic Release Inventory top ten list.

C. Other Program Funding Summary: N/A