ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2 Exhibit)

February 2003

BUDGET ACTIVITY	PE NUMBER AND TITLE
3 - Advanced technology development	**0603728A - Environmental Quality Technology Demonstrations**

	COST (In Thousands)	FY 2002 Actual	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	FY 2006 Estimate	FY 2007 Estimate	FY 2008 Estimate	FY 2009 Estimate
	Total Program Element (PE) Cost	7026	12846	15776	14897	13132	14075	15051	16508
002	ENVIRONMENTAL COMPLIANCE TECHNOLOGY	2609	1756	1417	666	1369	1985	2034	2080
025	POLLUTION PREVENTION TECHNOLOGY	0	806	2362	2832	3315	3472	3557	3638
03E	ENVIRONMENTAL RESTORATION TECHNOLOGY	1059	5995	11997	11399	8448	8618	9460	10790
EM3	PROTON EXCHANGE MEMBRANE FUEL CELL DEMO	3358	4289	0	0	0	0	0	0

A. Mission Description and Budget Item Justification: The objective of this program element is to mature and demonstrate technologies that will assist Army installations in becoming environmentally compatible without compromising the readiness or training critical to the success of the Objective Force. This program includes technology demonstrations for: restoration of sites contaminated with toxic and/or hazardous materials (such as unexploded ordnance [UXO]) resulting from Army operations; pollution prevention to minimize the Army's use and generation of toxic chemicals and hazardous wastes; compliance with environmental laws by control, treatment, and disposal of hazardous waste products; and conservation of natural and cultural resources while providing a realistic environment for mission activities. This program demonstrates technological feasibility, assesses technology operability and producibility, and transitions technology from the laboratory to field use. Technologies developed by this program element will improve the Army's ability to achieve environmental restoration and compliance at its installations, at active and inactive ranges and other training lands, and at its rework and production facilities. Technologies demonstrated will focus on reducing the cost of treating hazardous effluents and remediating Army sites contaminated by hazardous/toxic materiel. The cited work is consistent with the Army Science and Technology Master Plan (ASTMP), and the Army Modernization Plan. The program element contains no duplication with any effort within the Military Departments. Work is performed by the U.S. Army Engineer Research and Development Center and the U.S. Army Materiel Command. This program supports the Objective Force transition path of the Transformation Campaign Plan.

No Defense Emergency Response Funds were provided to the program.

B. Program Change Summary	FY 2002	FY 2003	FY 2004	FY 2005
Previous President's Budget (FY 2003)	7292	8980	9854	7172
Current Budget (FY 2004/2005 PB)	7026	12846	15776	14897
Total Adjustments	-266	3866	5922	7725
Congressional program reductions				
Congressional rescissions		-189		
Congressional increases		4500		
Reprogrammings	-64	-74		
SBIR/STTR Transfer	-202	-371		
Adjustments to Budget Years			5922	7725

Change Summary Explanation: Funding - FY 2004/2005: Funds increased to support environmental restoration technology development efforts.

FY03 Congressional Adds:
Proton Exchange Membrane Fuel Cell Demonstration Program, Project EM3 ($4500).

Projects with no R-2As:
- ($4500) Proton Exchange Membrane Fuel Cell Demonstration Program, Project EM3: The objective of this one year Congressional Add is to purchase, install, monitor, and maintain residential PEM fuel cell equipment at a limited number of military installations. No additional funding is required to complete this project.

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)

February 2003

BUDGET ACTIVITY	PE NUMBER AND TITLE	PROJECT
3 - Advanced technology development	**0603728A - Environmental Quality Technology Demonstrations**	**002**

COST (In Thousands)		FY 2002 Actual	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	FY 2006 Estimate	FY 2007 Estimate	FY 2008 Estimate	FY 2009 Estimate
002	ENVIRONMENTAL COMPLIANCE TECHNOLOGY	2609	1756	1417	666	1369	1985	2034	2080

A. Mission Description and Budget Item Justification: This project will mature and demonstrate technology for achieving environmental compliance at Army installations. Technology demonstrated will reduce the cost of treating hazardous effluents from Army installations, including ammunition plants, depots and arsenals, to satisfy increasingly stringent wastewater and air pollutant discharge standards. Army facilities are now subject to fines and facility shutdowns for violation of Federal, state, and local air and wastewater discharge regulations. This technology is essential to control and reduce the generation of wastes to satisfy hazardous waste reduction goals, and to avoid future hazardous waste disposal costs and liabilities to the Army. Efforts under this project will enable the Army to reduce pollution at installations while complying with the myriad of Federal, state, and host country regulations dealing with hazardous wastewater, air emissions, and solid wastes. The cited work is consistent with the Army Science and Technology Master Plan (ASTMP), and the Army Modernization Plan. The program element contains no duplication with any effort within the Military Departments. Work is performed by the U.S. Army Engineer Research and Development Center. This project supports the Objective Force transition path of the Transformation Campaign Plan.

No Defense Emergency Response Funds were provided to the project.

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)

February 2003

BUDGET ACTIVITY	PE NUMBER AND TITLE	PROJECT
3 - Advanced technology development	**0603728A - Environmental Quality Technology Demonstrations**	**002**

Accomplishments/Planned Program	FY 2002	FY 2003	FY 2004	FY 2005
Installation Operations – Demonstrate environmentally safe and cost-effective technologies for removing lead-based paint and reducing Hazardous Air Pollutants (HAP) emissions from Army sources to meet National Emission Standards for HAP. In FY02, demonstrated in situ extraction technologies for lead in soil to reduce lead levels to below the Environmental Protection Agency's level of concern (400 ppm). Demonstrated activated carbon control technology to control hazardous organic solvent emissions from Army industrial facilities. Demonstrated a method and biofiltration system apparatus (patent filed) for treating volatile organic compounds, odors, and biodegradable aerosol/particulates in air emissions. In FY03, demonstrate lead removal technologies that result in non-hazardous waste that leaches less than the U.S. Environmental Protection Agency criterion of 5 ppm lead. Demonstrate rotating media biofilter technology for control of hazardous air pollutants emissions from surface coating and cleaning operations. In FY04, demonstrate zero emission control system for control of HAP emissions from chromium plating operations. In FY05, demonstrate complete emission control system for demil furnaces.	2609	1756	1417	666
Totals	2609	1756	1417	666

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)

February 2003

BUDGET ACTIVITY	PE NUMBER AND TITLE	PROJECT
3 - Advanced technology development	**0603728A - Environmental Quality Technology Demonstrations**	**025**

COST (In Thousands)		FY 2002 Actual	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	FY 2006 Estimate	FY 2007 Estimate	FY 2008 Estimate	FY 2009 Estimate
025	POLLUTION PREVENTION TECHNOLOGY	0	806	2362	2832	3315	3472	3557	3638

A. Mission Description and Budget Item Justification: The objective of this project is to mature and demonstrate pollution prevention advanced technologies required to comply with regulations mandated by Federal, State and Local environmental and health laws. Technology thrusts under this project include: (1) demonstration of new coating materials and processes to comply with existing and new national laws and local regulations, (2) demonstration of advanced technologies for the reuse and recycling of solid waste resulting from barracks and motor pool modernization programs required to meet the operational needs of the Objective Force, and (3) demonstration of advanced technologies to eliminate or significantly reduce the environmental impacts that threaten the sustainment of rocket and missile propellant production and maintenance facilities, and training ranges. These propellant technologies are transitioned from program element 0602720A, project 895, and will ensure that advanced energetic materials required for FCS high performance munitions are developed that meet weapons lethality and survivability stretch goals. The work is performed at the U.S Army Research Laboratory, Aberdeen Proving Ground, MD, the U.S. Army Engineer Research and Development Center, Champaign, IL, and the Aviation and Missile Research, Development and Engineering Center, Huntsville, AL. The cited work is consistent with the Army Science and Technology Master Plan (ASTMP), and the Army Modernization. The project contains no duplication of effort within the military departments. This project supports the Objective Force transition path of the Transformation Campaign Plan.

No Defense Emergency Response Funds were provided to the project.

Accomplishments/Planned Program	FY 2002	FY 2003	FY 2004	FY 2005
Sustainable Painting Operations – In FY03, reformulate, evaluate, qualify and implement hazardous air pollutant (HAP) free rubber-to-metal bonding materials and procedures. In FY04, demonstrate HAP free general and high performance munitions coating materials. In FY05, demonstrate HAP free solvents for depainting. Solid Waste Diversion - In FY05, demonstrate advanced technologies for the reuse and recycling of solid waste resulting from barracks and motor pool modernization programs. Ordnance Manufacture, Maintenance, Use, and Surveillance - In FY05, demonstrate benign propellant alternatives that eliminate or significantly reduce the environmental impacts associated with the manufacture, maintenance, use and surveillance of rocket and missile propellants.	0	806	2362	2832
Totals	0	806	2362	2832

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February 2003

BUDGET ACTIVITY	PE NUMBER AND TITLE	PROJECT
3 - Advanced technology development	**0603728A - Environmental Quality Technology Demonstrations**	**03E**

COST (In Thousands)		FY 2002 Actual	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	FY 2006 Estimate	FY 2007 Estimate	FY 2008 Estimate	FY 2009 Estimate
03E	ENVIRONMENTAL RESTORATION TECHNOLOGY	1059	5995	11997	11399	8448	8618	9460	10790

A. Mission Description and Budget Item Justification: This project will mature and demonstrate technologies to improve the Army's ability to achieve cost-effective environmental restoration of contaminated sites at its installations, active and inactive ranges, and its rework and production facilities. Technologies demonstrated within this project focus on reducing the cost of remediation of Army sites contaminated by hazardous/toxic material and are transitioned from program element 0602720A, projects F25 and 835. Efforts under this project will enable the Army to prevent pollution of the air, soil, and groundwater at installations, ranges, facilities, and operations, and to comply with the myriad of Federal, state, and host country regulations dealing with contaminated soil and groundwater. This program includes demonstrations of proof of technological feasibility and assessments of operability and productivity, and includes technology transition from the laboratory to demonstration/validation funded under RDT&E program element 0603779A, project 04E. The program is supported by the Office of the Secretary of Defense's Technology Area Review and Assessment process. The cited work is consistent with the Army Science and Technology Master Plan (ASTMP), and the Army Modernization. The program element contains no duplication with any effort within the Military Departments. Work is performed by the U.S. Army Engineer Research and Development Center. This project supports the Objective Force transition path of the Transformation Campaign Plan.

No Defense Emergency Response Funds were provided to the project.

Accomplishments/Planned Program	FY 2002	FY 2003	FY 2004	FY 2005
UXO – Demonstrate high probability of detecting buried UXO and reduce false alarms caused by non-UXO clutter through the advancement of sensing technology and data analysis. Develop removal and recovery technologies for UXO in shallow water and difficult terrain and develop hazard assessment models for planning UXO excavation and removal. These technologies are critical for the Army to increase safety of removal, to design appropriate removal operations, and to reduce removal costs. In FY02, evaluated off-the-shelf UXO sensor positioning and tracking technologies. In FY03, formulate a demonstration plan for a series of UXO detection/discrimination multi-sensing and processing data acquisition/data analysis methods, each tailored to a specific set of site environmental conditions. In FY04, demonstrate an integrated suite of UXO detection multi-sensing and processing modes optimized for site-specific environmental characteristics. Fabricate an optimized multi-sensor and data fusion analysis UXO detection/discrimination system. In FY05, demonstrate safe means of removal of soil and sediment from around suspected UXO. Develop model that can assess the explosives safety hazards at individual UXO sites.	149	2038	1897	2180
Hazard/Risk Assessment Tools for Military Unique Compounds – Develop an integrated modeling platform for hazard/risk management and assessment that will reduce time and cost for risk assessment and for evaluating various cleanup scenarios at Army sites. In FY02, demonstrated prediction of contaminant fate and transport and prediction of spatial and temporal risk of effect to specific endpoint organisms at reduced time and cost with the Army Risk Assessment Modeling System (ARAMS). In FY03, link comprehensive screening toxicity and bioaccumulation models to ARAMS. In FY04, demonstrate a rigorous ARAMS that seamlessly links models of exposure/effects with toxicological data for multiple species. In FY05, complete advanced version of ARAMS capable of assessing multiple media and exposure pathways with uptake and transfer to environmental endpoints.	910	3957	4563	3148
In Situ Remediation Technologies for Contaminated Groundwater and Soils – Demonstrate in situ (in place without pumping or excavation) treatment technologies to remediate Army sites contaminated with explosives and other organic contaminants and with heavy metals. In FY04, demonstrate technology for in situ biodegradation of explosives in groundwater; demonstrate commercial off-the-shelf technologies for analyzing or detecting military unique compounds on site. In FY05, demonstrate advanced electro-kinetic treatment technologies for lead removal from soils; demonstrate in situ reactive barriers and/or reactive barriers coupled with biodegradation for treating explosives in groundwater and base hydrolysis for explosives contamination.	0	0	3628	3518

Accomplishments/Planned Program (continued)	FY 2002	FY 2003	FY 2004	FY 2005
Characterization, Evaluation and Remediation of Distributed Source Contamination on Army Ranges – Demonstrate cost effective remediation and management technologies for contaminants widely distributed over large areas on active and inactive Army ranges and facilities. In FY04, demonstrate aggressive chemical metal treatment alternatives for small arms training ranges. Demonstrate recycling metal contaminated extracts for soils treatment systems. In FY05, develop predictive model for distributed source contamination impacts on inactive and live fire training ranges. Adapt hazardous wastes site restoration processes and techniques for application to distributed contamination sources on inactive and live fire ranges. Demonstrate distributed source contamination restoration techniques on inactive and live fire ranges.	0	0	1909	2553
Totals	1059	5995	11997	11399