Exhibit R-2, PB 2011 Army RDT&E Budget Item Justification											DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 2040: *Research, Development, Test & Evaluation, Army* BA 2: *Applied Research*				R-1 ITEM NOMENCLATURE PE 0602720A: *Environmental Quality Technology*							
COST ($ in Millions)	**FY 2009 Actual**	**FY 2010 Estimate**	**Base FY 2011 Estimate**	**OCO FY 2011 Estimate**	**Total FY 2011 Estimate**	**FY 2012 Estimate**	**FY 2013 Estimate**	**FY 2014 Estimate**	**FY 2015 Estimate**	**Cost To Complete**	**Total Cost**
Total Program Element	15.786	25.469	18.364	0.000	18.364	15.943	16.020	16.325	16.627	0	142.898
048: *IND OPER POLL CTRL TEC*	2.991	3.112	3.186	0.000	3.186	3.259	3.332	3.396	3.477	Continuing	Continuing
835: *MIL MED ENVIRON CRIT*	3.213	3.267	5.836	0.000	5.836	3.375	3.436	3.500	3.558	Continuing	Continuing
895: *POLLUTION PREVENTION*	3.909	3.709	3.884	0.000	3.884	3.955	4.026	4.097	4.163	Continuing	Continuing
896: *BASE FAC ENVIRON QUAL*	5.673	5.731	5.458	0.000	5.458	5.354	5.226	5.332	5.429	Continuing	Continuing
EM5: *ENVIRONMENTAL QUALITY APPLIED RSCH - AMC (CA)*	0.000	7.660	0.000	0.000	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing
F35: *Environmental Quality Applied Research (CA)*	0.000	1.990	0.000	0.000	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing

A. Mission Description and Budget Item Justification

This program element (PE) provides enabling technologies that support the long-term sustainment of Army training and testing activities by improving the Army's ability to comply with requirements mandated by federal, state and local environmental/health laws and reducing the cost of this compliance. This program develops enabling technologies to decontaminate or neutralize Army-unique hazardous and toxic wastes at sites containing waste ammunition, explosives, heavy metals, propellants, smokes, chemical munitions, and other organic contaminants; as well as technology to avoid the potential for future hazardous waste problems, by reducing hazardous waste generation through process modification and control, materials recycling and substitution. This program develops technologies to predict and mitigate range and maneuver constraints associated with current and emerging weapon systems, doctrine, and regulations. Research is transitioned to PE 0603728A (Environmental Quality Technology Demonstrations). The cited work is consistent with the Director, Defense Research and Engineering Strategic Plan, the Army Modernization Strategy, the Army Science and Technology Master Plan, and supports the Army Strategy for the Environment. Work in this PE is performed by the US Army Engineer Research and Development Center (ERDC), Vicksburg, MS, the Center for Health Promotion and Preventive Medicine, Aberdeen Proving Ground, MD, and the Army Research Laboratory (ARL), Aberdeen Proving Ground, MD.

Exhibit R-2, PB 2011 Army RDT&E Budget Item Justification	DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 2040: *Research, Development, Test & Evaluation, Army* BA 2: *Applied Research*	**R-1 ITEM NOMENCLATURE** PE 0602720A: *Environmental Quality Technology*

B. Program Change Summary ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
Previous President's Budget	19.799	15.902	15.834	0.000	15.834
Current President's Budget	15.786	25.469	18.364	0.000	18.364
Total Adjustments	-4.013	9.567	2.530	0.000	2.530
• Congressional General Reductions		-0.133			
• Congressional Directed Reductions					
• Congressional Rescissions		0.000			
• Congressional Adds		9.700			
• Congressional Directed Transfers					
• Reprogrammings	-3.683	0.000			
• SBIR/STTR Transfer	-0.330	0.000			
• Adjustments to Budget Years	0.000	0.000	2.530	0.000	2.530

Change Summary Explanation

FY09 decrease is due to reprogramming of congressional special interest item for proper execution.FY10 Congressionally directed increases. FY11 increase for Environmental Nanotechnology research.

Exhibit R-2A, PB 2011 Army RDT&E Project Justification			DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 2040: *Research, Development, Test & Evaluation, Army* BA 2: *Applied Research*	R-1 ITEM NOMENCLATURE PE 0602720A: *Environmental Quality Technology*	PROJECT 048: *IND OPER POLL CTRL TEC*	

COST ($ in Millions)	FY 2009 Actual	FY 2010 Estimate	Base FY 2011 Estimate	OCO FY 2011 Estimate	Total FY 2011 Estimate	FY 2012 Estimate	FY 2013 Estimate	FY 2014 Estimate	FY 2015 Estimate	Cost To Complete	Total Cost
048: *IND OPER POLL CTRL TEC*	2.991	3.112	3.186	0.000	3.186	3.259	3.332	3.396	3.477	Continuing	Continuing

A. Mission Description and Budget Item Justification

This project provides technologies to enable the Army to reduce or eliminate environmental impacts both in the United States and abroad. These technologies reduce the impact of legal and regulatory environmental restrictions on installation facilities, training and testing lands and ranges, as well as avoid fines and facility shutdowns within the United States and reduce environmental impacts to the Warfighter abroad. New and innovative technologies are essential for the effective control and reduction of military unique hazardous and non-hazardous wastes on military installations and associated with contingency operations bases worldwide. Efforts focus on the impacts of new materiel that will enter the Army inventory within the next decade and beyond. This project focuses on developing sustainable environmental protection technologies that help the Army maintain environmental compliance from sources of industrial pollution such as production facilities, facility contamination, and other waste streams. Efforts abroad include a focus on technologies to provide deployed forces with environmentally safe, operationally enhanced and cost effective technologies and/or processes to achieve maximum diversion, minimization, or volume reduction of base camp and field waste. Additional work is focused on environmental risk assessment for installations associated with noise, air quality and carbon footprint.The cited work is consistent with the Director, Defense Research and Engineering Strategic Plan, the Army Modernization Strategy, the Army Science and Technology Master Plan, and supports the Army Strategy for the Environment. Work in this project is performed by the US Army Engineer Research and Development Center (ERDC), Vicksburg, MS.

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	Base FY 2011	OCO FY 2011	Total FY 2011
Program #1	2.991	3.085	3.186	0.000	3.186
Industrial Compliance and Pollution Prevention Readiness: In FY09, developed new sensing modalities using mimicked human physiological responses to detect acutely toxic substances in water. Also, completed development of attenuation functions in frequency and distance using a variety of sound propagation calculation models to reduce the noise footprint and training restrictions on Army ranges. In FY10, develop physiologically relevant chip/organ response on micro-fluidic sensing platforms for real-time water analysis for heavy metals (lead), anionic contaminants (perchlorate), and water toxins. Complete evaluation of anaerobic fluidized bed reactor and zero valent iron treatment reduction technoloiges to reduce or eliminate environmental impacts from selective insensitive munitions processing residues through a bacterial process allowing the carbon and nitrogen to be recycled in natural, aerobic cycles. Develop modeling approaches to determine noise attenuation in forests					

Exhibit R-2A, PB 2011 Army RDT&E Project Justification		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 2040: *Research, Development, Test & Evaluation, Army* BA 2: *Applied Research*	R-1 ITEM NOMENCLATURE PE 0602720A: *Environmental Quality Technology*	PROJECT 048: *IND OPER POLL CTRL TEC*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	Base FY 2011	OCO FY 2011	Total FY 2011
and to predict impacts of cumulative land use activities on Army training ranges through research to quantify changes that vary with respect to frequency, intensity, and duration for enabling land use availability for training. In FY11, will complete development of an archetype chip device for acute toxicity measurement for compounds of military interest and begin development of air emission factors associated with wild and prescribed fire burns on range and training lands. Will examine ecosystem response to naturally occurring fires and adjust prescribed fire regimes. *FY 2009 Accomplishments:* FY 2009 *FY 2010 Plans:* FY 2010 *Base FY 2011 Plans:* FY 2011 Base *OCO FY 2011 Plans:* FY 2011 OCO					
Program #2 Small Business Innovative Research/Small Business Technology Transfer Programs *FY 2009 Accomplishments:* FY 2009 *FY 2010 Plans:* FY 2010	0.000	0.027	0.000	0.000	0.000

Exhibit R-2A, PB 2011 Army RDT&E Project Justification		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 2040: *Research, Development, Test & Evaluation, Army* BA 2: *Applied Research*	R-1 ITEM NOMENCLATURE PE 0602720A: *Environmental Quality Technology*	PROJECT 048: *IND OPER POLL CTRL TEC*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	Base FY 2011	OCO FY 2011	Total FY 2011
Base FY 2011 Plans: FY 2011 Base *OCO FY 2011 Plans:* FY 2011 OCO					
Accomplishments/Planned Programs Subtotals	2.991	3.112	3.186	0.000	3.186

C. Other Program Funding Summary ($ in Millions)

N/A

D. Acquisition Strategy

N/A

E. Performance Metrics

Performance metrics used in the preparation of this justification material may be found in the FY 2010 Army Performance Budget Justification Book, dated May 2010.

Exhibit R-2A, PB 2011 Army RDT&E Project Justification			DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 2040: *Research, Development, Test & Evaluation, Army* BA 2: *Applied Research*	R-1 ITEM NOMENCLATURE PE 0602720A: *Environmental Quality Technology*	PROJECT 835: *MIL MED ENVIRON CRIT*	

COST ($ in Millions)	FY 2009 Actual	FY 2010 Estimate	Base FY 2011 Estimate	OCO FY 2011 Estimate	Total FY 2011 Estimate	FY 2012 Estimate	FY 2013 Estimate	FY 2014 Estimate	FY 2015 Estimate	Cost To Complete	Total Cost
835: *MIL MED ENVIRON CRIT*	3.213	3.267	5.836	0.000	5.836	3.375	3.436	3.500	3.558	Continuing	Continuing

A. Mission Description and Budget Item Justification

This project provides a quantitative means to determine the environmental and human health effects resulting from exposure to explosives, propellants, smokes, and products containing nanomaterials produced or used in Army industrial, field, and battlefield operations or disposed of through past activities. The end results of this research are: (a) determination of acceptable contaminant concentration levels for residual munitions constituents (MCs) and munitions and explosives of concern (MECs) that minimize adverse effects on the environment and human health and (b) the development of methods that guide the design of nanomaterials such that adverse effects on human health or the environment are minimized in their designed state and when they enter the environment where they may break down. New research in toxicogenomics, nanomaterial technologies, computational/molecular modeling tools for toxicity and exposure assessment; impacts of climate change on biological processes; and attributes of sustainable energy production further reduces the uncertainty associated with both the probability of exposure and the ultimate effect if exposed. Interim products are US Environmental Protection Agency approved health advisories and criteria documents to be used in risk assessment procedures. The Army uses these criteria during negotiations with regulatory officials to set scientifically and economically appropriate cleanup and discharge limits at Army installations.The cited work is consistent with the Director, Defense Research and Engineering Strategic Plan, the Army Modernization Strategy, the Army Science and Technology Master Plan, and supports the Army Strategy for the Environment. Work in this project is performed by the US Army Engineer Research and Development Center (ERDC), Vicksburg, MS.

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	Base FY 2011	OCO FY 2011	Total FY 2011
Program #1	3.213	3.193	3.336	0.000	3.336
Effects of Munitions Constituents (MC)/Munitions and Explosives of Concern (MEC): In FY09, evaluated in-situ biosensor technologies for direct push wells (installed by pushing or hammering the drive rods as opposed to drilling or augering), finalized protocols for MC residue reduction, advanced the mathematical modeling of biological impacts due to existing MCs and devised computational chemistry methods for the prediction of reactivity and toxicity of explosives and decomposition products dissolved in water. Identified exposure quantification metrics for select representative nanomaterials. Explored a common framework to consolidate tools for comprehensive, multi-stressor range environmental risk assessments. In FY10, establish mathematical biological models forecasting MC toxicology. Complete computational chemistry methods for the prediction of					

Exhibit R-2A, PB 2011 Army RDT&E Project Justification		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 2040: *Research, Development, Test & Evaluation, Army* BA 2: *Applied Research*	R-1 ITEM NOMENCLATURE PE 0602720A: *Environmental Quality Technology*	PROJECT 835: *MIL MED ENVIRON CRIT*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	Base FY 2011	OCO FY 2011	Total FY 2011
explosives degradation in water and explore methods for predicting MC binding and movement in soil. Establish a nanomaterial periodic table and framework for integrating environmental attributes with nanotechnology development. In FY11, will complete a computational biology tool for predictive toxicology of MCs. Will devise computational chemistry methods relating chemical mechanisms to toxicity in soils. Will complete beta version testing and release of the Training Range Environmental Evaluation and Characterization System for quantitative risk assessments of MC migration from ranges. Will begin developmental methods to incorporate environmental fate and effects into the design of nanomaterials. Will begin analysis of environmental forecasting the environmental toxicology and chemistry for composite nanonmaterials used in base sustainment and blast and ballistic protection. *FY 2009 Accomplishments:* FY 2009 *FY 2010 Plans:* FY 2010 *Base FY 2011 Plans:* FY 2011 Base *OCO FY 2011 Plans:* FY 2011 OCO					
Program #2 Nanotechnology-Environmental Effects: In FY11 will begin developmental methods to incorporate fate and effects into the design of nanomaterials from the nano-scale or micro-scale to the macro-scale. Will begin analysis of fate and effects for composite nanonmaterials supporting base sustainment and blast and ballistic protection.	0.000	0.000	2.500	0.000	2.500

Exhibit R-2A, PB 2011 Army RDT&E Project Justification		DATE: February 2010
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B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	Base FY 2011	OCO FY 2011	Total FY 2011
FY 2009 Accomplishments: FY 2009 *FY 2010 Plans:* FY 2010 *Base FY 2011 Plans:* FY 2011 Base *OCO FY 2011 Plans:* FY 2011 OCO					
Program #3 Small Business Innovative Research/Small Business Technology Transfer Programs *FY 2009 Accomplishments:* FY 2009 *FY 2010 Plans:* FY 2010 *Base FY 2011 Plans:* FY 2011 Base *OCO FY 2011 Plans:* FY 2011 OCO	0.000	0.074	0.000	0.000	0.000
Accomplishments/Planned Programs Subtotals	3.213	3.267	5.836	0.000	5.836

Exhibit R-2A, PB 2011 Army RDT&E Project Justification		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 2040: *Research, Development, Test & Evaluation, Army* BA 2: *Applied Research*	R-1 ITEM NOMENCLATURE PE 0602720A: *Environmental Quality Technology*	PROJECT 835: *MIL MED ENVIRON CRIT*

C. Other Program Funding Summary ($ in Millions)

N/A

D. Acquisition Strategy

N/A

E. Performance Metrics

Performance metrics used in the preparation of this justification material may be found in the FY 2010 Army Performance Budget Justification Book, dated May 2010.

Exhibit R-2A, PB 2011 Army RDT&E Project Justification			DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 2040: *Research, Development, Test & Evaluation, Army* BA 2: *Applied Research*	R-1 ITEM NOMENCLATURE PE 0602720A: *Environmental Quality Technology*	PROJECT 895: *POLLUTION PREVENTION*	

COST ($ in Millions)	FY 2009 Actual	FY 2010 Estimate	Base FY 2011 Estimate	OCO FY 2011 Estimate	Total FY 2011 Estimate	FY 2012 Estimate	FY 2013 Estimate	FY 2014 Estimate	FY 2015 Estimate	Cost To Complete	Total Cost
895: *POLLUTION PREVENTION*	3.909	3.709	3.884	0.000	3.884	3.955	4.026	4.097	4.163	Continuing	Continuing

A. Mission Description and Budget Item Justification

The objective of this project is to develop pollution prevention technologies required to reduce/eliminate the environmental footprint resulting from the manufacture, maintenance, use and surveillance of Army ordnance and other weapon systems. This project researches and develops revolutionary technologies to eliminate or significantly reduce the environmental impacts that threaten the sustainment of production and maintenance facilities, training ranges and operational areas. The project supports the transformation of the Army by ensuring that advanced energetic materials required for high-performance munitions (gun, rocket, missile propulsion systems, and warhead explosives) are devised to meet weapons lethality/ survivability stretch goals in parallel with, and in compliance to, foreseeable sustainment requirements. Specific technology thrusts include environmentally-benign explosives developed with computer modeling using Department of Defense (DoD) high-performance computing resources; novel energetics that capitalize on the unique behavior of nano-scale structures; chemically engineered explosive and propellant formulations produced with minimal environmental waste, long-storage lifetime, rapid/benign environmental degradation properties, and efficient extraction and reuse; and fuses, pyrotechnics, and initiators that are free from toxic chemicals. Other focus areas include base camp energy reduction initiatives, elimination of waste streams in contingency operations and heavy metal reductions from surface finishing processes. The project develops technologies for advanced development under PE 0603728A, project 025. The cited work is consistent with the Director, Defense Research and Engineering Strategic Plan, the Army Modernization Strategy, the Army Science and Technology Master Plan, and supports the Army Strategy for the Environment. Work in this project is performed by the Research, Development, and Engineering Command's (RDECOM) Army Research Laboratory (ARL), Aberdeen Proving Ground, MD, in collaboration with the Armaments Research, Development, and Engineering Center (ARDEC), Picatinny Arsenal, NJ, the Aviation and Missile Research, Development, and Engineering Center (AMRDEC), Huntsville, AL, and the Edgewood Chemical Biological Center (ECBC), Edgewood, MD.

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	Base FY 2011	OCO FY 2011	Total FY 2011
Program #1	3.909	3.605	3.884	0.000	3.884
Rocket and Missile Propellants: In FY09 optimized and evaluated performance of propellants for insertion into the new none line of sight (NLOS) missile. In FY10, design and model the next generation environmentally benign propellant ingredients. In FY11, will simulate performance of next generation of environmentally benign propellant compositions. Conventional Ammunition: In FY09, modeled performance of new environmentally benign explosive molecules in weapons systems. In FY10, design novel, environmentally benign explosive					

Exhibit R-2A, PB 2011 Army RDT&E Project Justification		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 2040: *Research, Development, Test & Evaluation, Army* BA 2: *Applied Research*	R-1 ITEM NOMENCLATURE PE 0602720A: *Environmental Quality Technology*	PROJECT 895: *POLLUTION PREVENTION*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	Base FY 2011	OCO FY 2011	Total FY 2011
compositions consisting of new molecules. In FY11, will synthesize gram quantities of novel explosive compositions and conduct screening tests to determine most effective compositions. Pyrotechnics: In FY09, investigated environmentally sustainable battle field effects training simulators, military flares, and fuze delays. In FY10, down-select candidate compositions for environmentally friendly obscurants. In FY11, will transition sustainable flare, delay and signal formulation to advanced technology development. Heavy Metal Reduction: In FY10, evaluate chromate/cadmium-free materials and processes in a laboratory environment. In FY11, will mature new processes for demonstration on gun barrels and fasteners. Zero Footprint Camp: In FY10, evaluate technologies in a laboratory environment that reduce base camp energy and water supply demands. In FY11, will refine water re-cycling technologies for demonstration in relevant environment. *FY 2009 Accomplishments:* FY 2009 *FY 2010 Plans:* FY 2010 *Base FY 2011 Plans:* FY 2011 Base *OCO FY 2011 Plans:* FY 2011 OCO					
Program #2 Small Business Innovative Research/Small Business Technology Transfer Programs *FY 2009 Accomplishments:* FY 2009	0.000	0.104	0.000	0.000	0.000

Exhibit R-2A, PB 2011 Army RDT&E Project Justification		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 2040: *Research, Development, Test & Evaluation, Army* BA 2: *Applied Research*	R-1 ITEM NOMENCLATURE PE 0602720A: *Environmental Quality Technology*	PROJECT 895: *POLLUTION PREVENTION*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	Base FY 2011	OCO FY 2011	Total FY 2011
FY 2010 Plans: FY 2010 *Base FY 2011 Plans:* FY 2011 Base *OCO FY 2011 Plans:* FY 2011 OCO					
Accomplishments/Planned Programs Subtotals	3.909	3.709	3.884	0.000	3.884

C. Other Program Funding Summary ($ in Millions)

N/A

D. Acquisition Strategy

N/A

E. Performance Metrics

Performance metrics used in the preparation of this justification material may be found in the FY 2010 Army Performance Budget Justification Book, dated May 2010.

Exhibit R-2A, PB 2011 Army RDT&E Project Justification			DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 2040: *Research, Development, Test & Evaluation, Army* BA 2: *Applied Research*	R-1 ITEM NOMENCLATURE PE 0602720A: *Environmental Quality Technology*	PROJECT 896: *BASE FAC ENVIRON QUAL*	

COST ($ in Millions)	FY 2009 Actual	FY 2010 Estimate	Base FY 2011 Estimate	OCO FY 2011 Estimate	Total FY 2011 Estimate	FY 2012 Estimate	FY 2013 Estimate	FY 2014 Estimate	FY 2015 Estimate	Cost To Complete	Total Cost
896: *BASE FAC ENVIRON QUAL*	5.673	5.731	5.458	0.000	5.458	5.354	5.226	5.332	5.429	Continuing	Continuing

A. Mission Description and Budget Item Justification

This project will provide environmental risk assessment, analysis, monitoring, modeling, and mitigation technologies to support sustainable use of the Army's facilities, training lands, firing ranges, and airspace to reduce or eliminate environmental constraints to military missions. This project provides the Army the technical capability to manage, protect, and improve the biophysical characteristics of training and testing areas needed for realistic ranges and training lands. Technologies within this project enable users to match mission events and training schedules with the resource capabilities of specific land areas and understand how the use of those resources effect mission support and environmental compliance. The project provides novel methods and technologies to restore lands damaged during training activities and allow sustained use of installation facilities and training land resources. The project supports readiness and full use of training lands through development of threatened and endangered species monitoring technology and management technologies for species at risk. The project also provides tools and technologies to avoid training restrictions and reduce constraints on training lands associated with invasive species and potential impacts from climate change. The cited work is consistent with the Director, Defense Research and Engineering Strategic Plan, the Army Modernization Strategy, the Army Science and Technology Master Plan, and supports the Army Strategy for the Environment. Work in this project is performed by the US Army Engineer Research and Development Center (ERDC), Vicksburg, MS.

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	Base FY 2011	OCO FY 2011	Total FY 2011
Program #1	2.939	1.532	0.000	0.000	0.000
Threatened and Endangered Species (TES) Management to Reduce Operational Constraints: In FY09, advanced research from high priority species that are listed to research involving a multi-species approach for improved detection of species at risk and predictive synthesis models for effects of military disturbance on species at risk. Developed a multi-species, metapopulation model for species at risk. Advanced Light Detection and Ranging (LIDAR) remote sensing capability for identification of species at risk populations and habitats on Army lands. In FY10, Complete development of detection techniques, multi-species population and risk prediction models and understanding of advanced genetic methods to manage species at risk. This assists the Army in reducing the number of future listed species and their associated constraints on military training.					

Exhibit R-2A, PB 2011 Army RDT&E Project Justification		DATE: February 2010
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B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	Base FY 2011	OCO FY 2011	Total FY 2011
FY 2009 Accomplishments: FY 2009 *FY 2010 Plans:* FY 2010 *Base FY 2011 Plans:* FY 2011 Base *OCO FY 2011 Plans:* FY 2011 OCO					
Program #2 Predictive Risk Assessment and Management for Army Ranges and Training Lands: Technologies developed in this effort are also aimed at minimizing Training Land/Natural Resource Conflicts for Sustained Mission Support. In FY09, initiated analysis of a comprehensive approach to control invasive terrestrial plants focusing on biological control and application of native bridge species as competitors to invasion. In FY10 complete biometric sampling for detecting and assessing species invasiveness on Army ranges and training lands. Develop unified landscape utility metrics for mission and resource condition to maximize landscape resources supporting evolving training doctrine. In FY11, will complete a spatially explicit, multi-objective decision support model for management optimization of multiple invasive species accounting for ecological, economic, and training impacts. Will quantify synergistic and anergistic interactions between training/non-military land uses to develop quantitative methods for comparative impact analysis of training and alternative land uses. *FY 2009 Accomplishments:* FY 2009	2.734	4.188	5.458	0.000	5.458

Exhibit R-2A, PB 2011 Army RDT&E Project Justification		DATE: February 2010
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B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	Base FY 2011	OCO FY 2011	Total FY 2011
FY 2010 Plans: FY 2010 *Base FY 2011 Plans:* FY 2011 Base *OCO FY 2011 Plans:* FY 2011 OCO					
Program #3 SBIR/STTR *FY 2009 Accomplishments:* FY 2009 *FY 2010 Plans:* FY 2010 *Base FY 2011 Plans:* FY 2011 Base *OCO FY 2011 Plans:* FY 2011 OCO	0.000	0.011	0.000	0.000	0.000
Accomplishments/Planned Programs Subtotals	5.673	5.731	5.458	0.000	5.458

Exhibit R-2A, PB 2011 Army RDT&E Project Justification		DATE: February 2010
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C. Other Program Funding Summary ($ in Millions)

N/A

D. Acquisition Strategy

N/A

E. Performance Metrics

Performance metrics used in the preparation of this justification material may be found in the FY 2010 Army Performance Budget Justification Book, dated May 2010.

Exhibit R-2A, PB 2011 Army RDT&E Project Justification			DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 2040: *Research, Development, Test & Evaluation, Army* BA 2: *Applied Research*	R-1 ITEM NOMENCLATURE PE 0602720A: *Environmental Quality Technology*	PROJECT EM5: *ENVIRONMENTAL QUALITY APPLIED RSCH - AMC (CA)*	

COST ($ in Millions)	FY 2009 Actual	FY 2010 Estimate	Base FY 2011 Estimate	OCO FY 2011 Estimate	Total FY 2011 Estimate	FY 2012 Estimate	FY 2013 Estimate	FY 2014 Estimate	FY 2015 Estimate	Cost To Complete	Total Cost
EM5: *ENVIRONMENTAL QUALITY APPLIED RSCH - AMC (CA)*	0.000	7.660	0.000	0.000	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing

A. Mission Description and Budget Item Justification

Congressional Interest Item funding for Environmental Quality applied research.

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	Base FY 2011	OCO FY 2011	Total FY 2011
Program #1	0.000	2.486	0.000	0.000	0.000
MLRS Disposal System. This is a Congressional Interest Item. *FY 2009 Accomplishments:* FY 2009 *FY 2010 Plans:* FY 2010 *Base FY 2011 Plans:* FY 2011 Base *OCO FY 2011 Plans:* FY 2011 OCO					
Program #2	0.000	0.796	0.000	0.000	0.000
Cluster Bomb Unit & Combined Effects Munition Demilitarization. This is a Congressional Interest Item					

Exhibit R-2A, PB 2011 Army RDT&E Project Justification		DATE: February 2010
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B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	Base FY 2011	OCO FY 2011	Total FY 2011
FY 2009 Accomplishments: FY 2009 *FY 2010 Plans:* FY 2010 *Base FY 2011 Plans:* FY 2011 Base *OCO FY 2011 Plans:* FY 2011 OCO					
Program #3 Rocket Motor Contained System. This is a Congressional Interest Item. *FY 2009 Accomplishments:* FY 2009 *FY 2010 Plans:* FY 2010 *Base FY 2011 Plans:* FY 2011 Base *OCO FY 2011 Plans:* FY 2011 OCO	0.000	0.796	0.000	0.000	0.000
Program #4	0.000	1.592	0.000	0.000	0.000

Exhibit R-2A, PB 2011 Army RDT&E Project Justification		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 2040: *Research, Development, Test & Evaluation, Army* BA 2: *Applied Research*	R-1 ITEM NOMENCLATURE PE 0602720A: *Environmental Quality Technology*	PROJECT EM5: *ENVIRONMENTAL QUALITY APPLIED RSCH - AMC (CA)*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	Base FY 2011	OCO FY 2011	Total FY 2011
Navy Gun Ammo Demilitarization & Recycling. This is a Congressional Interest Item. *FY 2009 Accomplishments:* FY 2009 *FY 2010 Plans:* FY 2010 *Base FY 2011 Plans:* FY 2011 Base *OCO FY 2011 Plans:* FY 2011 OCO					
Program #5 Biowaste-to-Bioenergy Center. This is a Congressional Interest Item. *FY 2009 Accomplishments:* FY 2009 *FY 2010 Plans:* FY 2010 *Base FY 2011 Plans:* FY 2011 Base *OCO FY 2011 Plans:* FY 2011 OCO	0.000	1.990	0.000	0.000	0.000

Exhibit R-2A, PB 2011 Army RDT&E Project Justification		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 2040: *Research, Development, Test & Evaluation, Army* BA 2: *Applied Research*	R-1 ITEM NOMENCLATURE PE 0602720A: *Environmental Quality Technology*	PROJECT EM5: *ENVIRONMENTAL QUALITY APPLIED RSCH - AMC (CA)*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	Base FY 2011	OCO FY 2011	Total FY 2011
Accomplishments/Planned Programs Subtotals	0.000	7.660	0.000	0.000	0.000

C. Other Program Funding Summary ($ in Millions)

N/A

D. Acquisition Strategy

N/A

E. Performance Metrics

Performance metrics used in the preparation of this justification material may be found in the FY 2010 Army Performance Budget Justification Book, dated May 2010.

Exhibit R-2A, PB 2011 Army RDT&E Project Justification			DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 2040: *Research, Development, Test & Evaluation, Army* BA 2: *Applied Research*	R-1 ITEM NOMENCLATURE PE 0602720A: *Environmental Quality Technology*	PROJECT F35: *Environmental Quality Applied Research (CA)*	

COST ($ in Millions)	FY 2009 Actual	FY 2010 Estimate	Base FY 2011 Estimate	OCO FY 2011 Estimate	Total FY 2011 Estimate	FY 2012 Estimate	FY 2013 Estimate	FY 2014 Estimate	FY 2015 Estimate	Cost To Complete	Total Cost
F35: *Environmental Quality Applied Research (CA)*	0.000	1.990	0.000	0.000	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing

A. Mission Description and Budget Item Justification

Congressional Interest Item funding for Environmental Quality applied research.

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	Base FY 2011	OCO FY 2011	Total FY 2011
Program #1	0.000	1.990	0.000	0.000	0.000
Chemical Materials and Environmental Modeling Project. This is a Congressional Interest Item. *FY 2009 Accomplishments:* FY 2009 *FY 2010 Plans:* FY 2010 *Base FY 2011 Plans:* FY 2011 Base *OCO FY 2011 Plans:* FY 2011 OCO					
Accomplishments/Planned Programs Subtotals	0.000	1.990	0.000	0.000	0.000

Exhibit R-2A, PB 2011 Army RDT&E Project Justification		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 2040: *Research, Development, Test & Evaluation, Army* BA 2: *Applied Research*	R-1 ITEM NOMENCLATURE PE 0602720A: *Environmental Quality Technology*	PROJECT F35: *Environmental Quality Applied Research (CA)*

C. Other Program Funding Summary ($ in Millions)

N/A

D. Acquisition Strategy

N/A

E. Performance Metrics

Performance metrics used in the preparation of this justification material may be found in the FY 2010 Army Performance Budget Justification Book, dated May 2010.