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CBDP BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 2008
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BUDGET ACTIVITY RDT&E DEFENSE-WIDE/ BA3 - Advanced Technology Development (ATD)	PE NUMBER AND TITLE 0603384BP CHEMICAL/BIOLOGICAL DEFENSE (ATD)
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COST (In Thousands)	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	Cost to	Total Cost
	Actual	Estimate	Estimate	Estimate	Estimate	Estimate	Estimate	Complete	
Total Program Element (PE) Cost	223838	245591	337927	311052	201671	191624	183109	Continuing	Continuing
CB3 CHEMICAL BIOLOGICAL DEFENSE (ATD)	103420	20499	19242	21745	14112	14178	13695	Continuing	Continuing
CI3 CONGRESSIONAL INTEREST ITEMS (ATD)	0	64860	0	0	0	0	0	0	64860
TB3 MEDICAL BIOLOGICAL DEFENSE (ATD)	87067	95527	252331	227287	128222	121096	112771	Continuing	Continuing
TC3 MEDICAL CHEMICAL DEFENSE (ATD)	15740	28726	26567	28961	30493	31539	31836	Continuing	Continuing
TE3 TEST & EVALUATION (ATD)	0	25993	26668	22204	19605	15468	15362	Continuing	Continuing
TR3 MEDICAL RADIOLOGICAL DEFENSE (ATD)	1995	2169	4878	2466	986	0	0	0	12494
TT3 TECHBASE TECHNOLOGY TRANSITION	15616	7817	8241	8389	8253	9343	9445	Continuing	Continuing

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BUDGET ACTIVITY
**RDT&E DEFENSE-WIDE/
 BA3 - Advanced Technology Development (ATD)**

PE NUMBER AND TITLE
0603384BP CHEMICAL/BIOLOGICAL DEFENSE (ATD)

A. Mission Description and Budget Item Justification: This program element (PE) demonstrates technologies that enhance the ability of U.S. forces to deter, defend against, and survive chemical and biological (CB) warfare. This program element (PE) funds advanced technology development for Joint Service and Service-specific requirements in both medical and physical sciences CB defense areas. The medical program aims to produce drugs, vaccines, and medical devices as countermeasures for CB threat agents. Specific areas of medical investigation include: prophylaxis, pretreatment, antidotes and therapeutics, personnel and patient decontamination, and medical management of casualties. In the physical sciences area, the focus is on demonstrations of CB defense technologies, including biological detection, chemical detection, and decontamination. These demonstrations, conducted in an operational environment with active user and developer participation, integrate diverse technologies to improve DoD Chemical/Biological Warfare (CBW) defense and deterrence. These demonstrations are leveraged by the Counterproliferation Support Program and include remote Biological Detection. Research efforts are also planned to evaluate technologies for Weapons of Mass Destruction Civil Support Teams (WMD-CSTs). Work conducted under this PE transitions to and provides risk reduction for System Integration/Demonstration (PE 0603384BP/PE 0604384BP) activities. The work in this PE is consistent with the Joint Service CB Defense Research, Development, and Acquisition (RDA) Plan. This PE also provides for the conduct of advanced technology development in the areas of real-time sensing, accelerated BW operational awareness, and the restoration of operations following a BW/CW attack. This program is dedicated to conducting proof-of-principle field demonstrations, and tests of system-specific technologies to meet specific military needs.

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B. <u>Program Change Summary:</u>		<u>FY 2007</u>	<u>FY 2008</u>	<u>FY 2009</u>
Previous President's Budget (FY 2008 PB)		235760	232302	388487
FY09 President's Budget (FY 2009 PB)		223838	245591	337927
Total Adjustments		-11922	13289	-50560
a. Congressional General Reductions		0	-51571	0
b. Congressional Increases		0	64860	0
c. Reprogrammings		-9632	0	0
d. SBIR/STTR Transfer		-2290	0	0
e. Other Adjustments		0	0	-50560

Change Summary Explanation:

Funding: FY09 - Inflation adjustment (+\$214K CB3; +\$2,750K TB3; +291K TC3; +\$291K TE3; +53K TR3; +\$91K TT3). Change proposals realigning funding within the Chemical Biological Defense Program (CBDP) RDT&E program (-\$2,250K TC3; -\$2,000K CB3). Defense-wide directed offsets (-\$50,000K TB3).

Schedule: N/A

Technical: N/A

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COST (In Thousands)	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	Cost to	Total Cost
	Actual	Estimate	Estimate	Estimate	Estimate	Estimate	Estimate	Complete	
CB3 CHEMICAL BIOLOGICAL DEFENSE (ATD)	103420	20499	19242	21745	14112	14178	13695	Continuing	Continuing

A. Mission Description and Budget Item Justification:

Project CB3 CHEMICAL BIOLOGICAL DEFENSE (ATD): This project demonstrates technology advancements for joint service application in the areas of chemical and biological agent detection and identification, decontamination, modeling and simulation, and individual/collective protection which will speed maturing of advanced technologies to reduce risk in system-oriented integration/demonstration efforts. This project funds science and technology to advance technology development. Beginning in FY 2007, the group heading for Modeling and Simulation/Battle Space Management was changed to Information Systems Technologies to be compatible with JPEO-CBD Joint Program Manager - Information Systems. Projects under CB3 Test and Evaluation will be reported under TE3 for FY 2008 and beyond.

B. Accomplishments/Planned Program

	<u>FY 2007</u>	<u>FY 2008</u>	<u>FY 2009</u>
Congressional Interest Items	32052	0	0

Accomplishments/Planned Program	FY2007	FY2008	FY2009
Self-Detoxifying Materials in CB Clothing - FY 07 - Refined concepts of producing multi-functional materials comprised of specially-formulated combinations of reactive nanoparticles and activated carbon that provide CB protection thru a synergistic effect of an adsorptive/reactive technology.	1288	0	0
Portable Rapid Bacterial Warfare Detection Unit - FY 07 - Enhanced the process for real-time detection and identification of biological warfare agents (BWA) and developed a field deployable system.	1489	0	0

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Accomplishments/Planned Program (Cont):		FY2007	FY2008	FY2009
Hand-Held Biosensor and Continuous Monitor for Biodetection - FY 07 - Increased efforts to advance optically based sensors for use as handheld technology.		1436	0	0
Chemical Biological Defense Program Initiative Fund - FY 07 - Initiated solicitation for proposals from degree-granting universities, nonprofit organizations, and commercial concerns, to include small businesses, in support of the CBDP to fund chemical and biological defense science and technology projects across a wide-range of military operations. Funded six projects that addressed standardized library of biological signatures, acoustic aerosol concentrator for high-sensitivity bioaerosol detection, micro-aerodynamic lens array aerosol concentrator, revolutionary respiratory/ocular protection concepts, toxin identification as a diagnostic tool, novel bi-functional reactivators for aged acetylcholinesterase, and new inhibitors of acetylcholinesterase that block inactivation by organophosphates.		9902	0	0
Immunological Biological/Chemical Agent Detector - FY 07 - Improved development of the multiplex, micro-array system.		991	0	0
Removal of NBC Agents in Drinking Water - FY 07 - Improved development of the water purification units.		1285	0	0
Small Accelerators and Detection Systems - FY 07 - Improved the detection and neutralization of chemical and biological threats with small accelerator/detection systems.		1981	0	0
NIDS Hand-Held Biological Detectors - FY 07 - Advanced the handheld reader and a pathogen concentration system.		2872	0	0
Rapid Response Database Systems - FY 07 - Advanced development of a Research Demonstration Center and a Portable Training and Demonstration Center that will present first responders and their managers with real-time status reports of data collected from hospitals, schools, doctors, pharmacies and veterinary offices that could support a response to a bio-terrorist attack or other hazard.		1090	0	0
Reactive Coatings Enhanced to Resist Chemical and Biological Contamination - FY 07 - Identified peroxide activated reactive coatings that can be used to aid in decontaminating critical military surfaces.		991	0	0
Project CB3/Line No: 033		Page 5 of 59 Pages	Exhibit R-2a (PE 0603384BP)	

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Accomplishments/Planned Program (Cont):		FY2007	FY2008	FY2009
Carbon Nanotube Bio-Chem Detector - FY 07 - Validated and built on the previous research in developing a prototype arrayed single-walled carbon nanotube (SWNT) CWA detector mounted on common transparency film that will be optimized using simultaneous resistance and alternating current independent responses.		1090	0	0
Liquid Crystal Sensor Technology Research and Development for Force Protection - FY 07 - Developed a sensor core adapted from new technology based on liquid crystal detection of molecular interactions on nanostructured surfaces.		991	0	0
Modular Chemical and Biological Detection System - FY 07 - Identified a combination of wavelengths that yielded the best path forward to identify threats with low false alarm rates and high specificity. Conducted on surface impacted aerosolized biological species.		991	0	0
Next Generation Threat Detection - FY 07 - Dedicated to the discovery, design, development and commercialization of new analytical devices and methodologies, and to the institutionalization of these capabilities so that the current regional leadership in these areas (and the underlying science area of analytical chemistry) can be secured.		1159	0	0
Protective Self-Decontaminating Surfaces - FY 07 - Prepared the transfer of the technology developed under this project from the laboratory to field a durable, long-lasting, self-decontaminating system for the individual and collective protection of personnel and platforms from airborne CB attacks.		1486	0	0
Rapid Response Sensor Networking for Multiple DoD Applications Phase 3 - FY 07 - Research and development efforts are ongoing on three types of sensors; colorimetric (flow-injection) sensors, photo-electric (PICM) sensors, and solid state gas sensors (SSGS). Each showed innovative development and significant promise.		991	0	0
Engineered Biological Detectors for Biological Warfare - FY 07 - Prototyped and demonstrated new approaches for leveraging existing commercial technology, products and processes for military purposes.		991	0	0
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Accomplishments/Planned Program (Cont):	FY2007	FY2008	FY2009
FY 07 - Chemical/Biological Defense Program - Advanced Development - Remaining project executed in TT3.	37	0	0
Low Cost Chemical Agent (CA) Detection System for Mission Critical Facilities - FY 07 - Accelerated the development of low cost monitors for chemical warfare agents and toxic industrial chemicals in air and water that exhibit high reliability and effective communication protocols.	991	0	0
Total	32052	0	0

	<u>FY 2007</u>	<u>FY 2008</u>	<u>FY 2009</u>
Information Systems Technology	9435	3728	3880

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Accomplishments/Planned Program	FY2007	FY2008	FY2009
<p>Information Systems Technology, CBDP Decision Capability -</p> <p>FY 07 - Completed verification and conducted demonstrations and exercises in targeted user communities of the CB Simulation Suite. Transition did not occur to JPM-IS due to a change in requirements. Initiated medical modeling area of research to evaluate existing models for infectious diseases. Initiated transition of NATO's Allied Medical Publication 8 (AMedP-8) chemical and biological models from Nuclear Biological Chemical Casualty and Resource Estimation Support Tool (NBC CREST) to JOEF.</p> <p>FY 08 - Transition Toxic Industrial Chemicals/Toxic Industrial Materials (TIC/TIM), long-term radiological effects, and AMedP-8 nuclear models and provide Verification & Validation (V&V) documentation from NBC CREST to JOEF. Develop a biological and a chemical agent human response model accounting for particle size distribution (PSD) effects; develop, implement and test additional agent response models accounting for PSD effects; deliver V&V software. Continue transition of NATO's AMedP-8 chemical and biological models from NBC CREST to JOEF.</p> <p>FY 09 - Verify and incorporate models for casualty estimates for infectious/contagious diseases into JEM. Validate models for predicting effects due to infectious/contagious diseases for JEM with real-world and simulation data. Complete transition of NATO's AMedP-8 chemical and biological models from NBC CREST to JOEF.</p>	1167	880	821

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Accomplishments/Planned Program (Cont):	FY2007	FY2008	FY2009
<p>Information Systems Technology, Chemical and Biological Warfare Effects on Operations -</p> <p>FY 07 - Tested and verified the Simulated Training and Analysis for Fixed Facilities/Sites (STAFFS) and contamination model linkages.</p> <p>FY 08 - Deliver Output Analysis Tool (OAT), Chemical Hazard Estimation Method Risk Assessment tool (CHEMRAT), Chemical Convoy Operations Risk Vulnerability Estimation Tool (CORVET), and STAFFS upgrades to the Joint Operational Effects Federation (JOEF).</p> <p>FY 09 - Deliver CBRN methodologies for tactical and theatre levels to JOEF. Deliver building interior modeling for JOEF. Complete transition of Agent Fate model to the Joint Effects Model (JEM). Transition mobile forces and shipboard models for CB effects on military operations to JOEF. Begin validation of decision support tools for CBRN for eventual transition to JOEF.</p>	2579	851	821

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Accomplishments/Planned Program (Cont):		FY2007	FY2008	FY2009
<p>Information Systems Technology, Chemical and Biological Hazard Environment Prediction -</p> <p>FY 07 - Included additional data types, and parameterizations in the Geographic Environmental Database Information System (GEDIS) 2.1 release. Initiated initial interior building transport modeling algorithm and software development. Conducted full-scale validation of Toxic Industrial Chemicals (TIC) chemistry model and developed methodology for TIC source emission improvements. Initiated development of improved climatological, terrain, land use, and population data sets. Transitioned improved meteorological modeling capabilities based on the mesoscale model forecast study including boundary layer modeling of surface heat fluxes over land and water into existing operational models - Weather Research and Forecast (WRF) and the Mesoscale Meteorological Model, Version 5 (MM5).</p> <p>FY 08 - Continue enhancement and testing in the GEDIS 2.2 release. Complete initial interior building transport modeling algorithm and software development. Initiate improved TIC/Toxic Industrial Materials (TIM) prototype integration into JEM. Begin extension of the Stationary Wind Fit with Turbulence (SWIFT) and provide updated mass consistency wind models and advanced urban models to the Joint Effects Model (JEM). Integrate advanced numerical weather prediction techniques for coastal, complex terrain and urban environments into JEM.</p> <p>FY 09 - Transition GEDIS 2.3 to JEM. Validate and verify building interior dispersion model. Complete improved TIC/TIM prototype integration into JEM. Transition multi-scale four-dimensional data assimilation model to operational centers. Deliver complete variable resolution database containing highly refined estimates of climatological and "typical" atmospheric conditions for any given location and time to JEM. Test and evaluate the use of the existing WRF/Urban Canopy Model (UCM) forecasts to drive JEM transport and dispersion prediction. Transition fully extended SWIFT mass consistency wind model to JEM.</p>		2116	843	1097
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Accomplishments/Planned Program (Cont):		FY2007	FY2008	FY2009
<p>Information Systems Technology, Battle Space Management -</p> <p>FY 07 - Demonstrated increased maturity and readiness of the Inter-LAN socket connection manager for transition to the Joint Warning and Reporting Network (JWARN) program. Developed an initial prototype of a software-based, user configurable, CBRN sensor supporting the ability to dynamically configure/message and support a subset of the features/functionality of the JWARN Component Interface Device (JCID) specification (JCID on a Chip). Developed, implemented, tested and transitioned the Sensor Alert Verification for Incident Operational Response (SAVIOR) capability. Completed the transition of Integrated Information Management System (IIMS) to Joint Operational Effects Federation (JOEF) by converting selected components to web services.</p> <p>FY 08 - Transition Inter-LAN Socket Connection Manager and JCID on a Chip to the JWARN program. Transition SAVIOR, a false alarm reduction capability, to JPM Contamination Avoidance.</p> <p>FY 09 - Transition the capability to exchange and multi-level fusion of actionable information with real world Command and Control (C2) systems in DoD, Coalition and Homeland Security and Homeland Defense (HLS/HLD) domains to JWARN.</p>		2934	861	549
<p>Information Systems Technology, Sensor Data Fusion -</p> <p>FY 07 - Demonstrated a prototype outdoor Sensor Placement Tool (SPT) and outdoor Source Term Estimation (STE) software in a realistic biological background. Investigated existing software for building interior STE and Hazard Refinement (HR) applications.</p> <p>FY 08 - Demonstrate and transition first-generation outdoor SPT to JWARN and JOEF. Demonstrate prototype building interior STE. Demonstrate prototype of second-generation outdoor SPT algorithm to include optimal hazard prediction capability.</p> <p>FY 09 - Transition first generation outdoor STE/HR and second-generation SPT software to JEM, JWARN and JOEF. Transition first-generation building interior STE and HR software to JEM and JOEF.</p>		639	293	592
Total		9435	3728	3880

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	<u>FY 2007</u>	<u>FY 2008</u>	<u>FY 2009</u>
Technology Transition	6763	4753	2919

Accomplishments/Planned Program	FY2007	FY2008	FY2009
<p>Technology Transition - FY 07 - Continued transition of DHS Low-Cost Bio-Aerosol Detector Systems (LBADS) and Defense Advanced Research Projects Agency (DARPA) Semiconductor UV Optical Sources (SUVOS) into core CBD program thru laboratory testing to meet DoD need. Expanded efforts to leverage technologies from other government agencies and non-government agencies into the CBDP. Continued competitive assessment of mature technologies. Candidate projects included: DARPA Solid-state Eye-safe Aerosol LIDAR (SEAL), Immune Building (multiple protection technologies), and Nanofiber aerosol filtration.</p> <p>FY 08 - Complete transition of DHS LBADS to Joint Biological Tactical Detection Systems (JBTDS). Continue competitive assessment of all mature technology from outside of the CBDP for rapid technology insertion into the capability areas.</p> <p>FY 09 - Continue competitive assessment of all mature technology from outside of the CBDP for rapid technology insertion into the capability areas. Reduction of \$2M for Plague Vaccine in FY 09 will reduce the number of technology transition for this year.</p>	6763	4753	2919
Total	6763	4753	2919

	<u>FY 2007</u>	<u>FY 2008</u>	<u>FY 2009</u>
Decontamination	2407	2113	1985

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Accomplishments/Planned Program		FY2007	FY2008	FY2009
<p>Decontamination, Solutions Chemistry - FY 07 - Completed development of reactive impregnated solvent-based wiping system and transitioned to the Joint Material Decontamination System (JMDS). Completed research on transportation, storage, and use of hydrogen peroxide for decontamination and transitioned to Joint Platform Interior Decontamination (JPID)/JMDS and Joint Service Sensitive Equipment Decontamination (JSSSED). Completed research on technologies to develop hydrogen peroxide at their point of use.</p>		653	0	0
<p>Decontamination, Solid Phase - FY 07 - Completed testing to provide chamber scale studies to assess the impact of applicator process and procedures on solid sorbents based on nanocrystalline metal oxides to support the Joint Service Transportable Decontamination System - Large Scale (JSTDS-LS). FY 08 - Complete research efforts to develop reactive sorbent nano-active suspensions and sprayable powders and transition to JSTDS-LS.</p>		884	1022	0
<p>Decontamination, Alternative Processes - FY 07 - Continued research initiated in BA2 to develop a gaseous chemical and biological decontamination system combining hot air and modified vaporous hydrogen peroxide, determined efficacy effects on decontamination of chemical and biological agents, and determined candidate formulation and application combinations to support JPID/JMDS. FY 08 - Complete research to develop a gaseous chemical and biological decontamination system combining hot air and modified vaporous hydrogen peroxide, determine efficacy effects on decontamination of chemical and biological agents, and determine candidate formulation and application combinations and transition to JPID/JMDS. Initiate efforts to investigate reactive materials and nanotechnology for decontamination processes and transfer efforts under the Protection capability area. FY 09 - Continue efforts to investigate reactive materials and nanotechnology for decontamination processes and transfer efforts under the Protection capability area.</p>		525	1091	1985
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Accomplishments/Planned Program (Cont):	FY2007	FY2008	FY2009
Decontamination, Process Fundamentals - FY 07 - Developed a process to comply with regulatory requirements for Environmental Protection Agency (EPA) registration of all DoD decontaminants by identifying a method that satisfies DoD requirements for bio-efficacy testing as well as satisfying EPA registration data requirements to streamline the approval process and save test dollars.	345	0	0
Total	2407	2113	1985

	<u>FY 2007</u>	<u>FY 2008</u>	<u>FY 2009</u>
Detection	20898	6810	7494

Accomplishments/Planned Program	FY2007	FY2008	FY2009
Detection Capabilities for Non-Traditional Agents - FY 07 - Continued the studies necessary to fill the identified gaps from the analytical studies on the impact of threat environments on the properties of neat agents focusing on biological materials followed by chemical materials. Initiated trade-studies on the impact of Hot-lightweight chemical detector (LCD) modifications to detect NTAs compared to the standard LCD. FY 08 - Complete impact studies to incorporate Hot-LCD modifications to standard LCD design and transition recommendations to the Joint Chemical Agent Detector (JCAD) program. Complete the studies necessary to fill the identified gaps from the analytical studies on the impact of threat environments on the properties of neat agents. Complete the development of agent to simulant correlations in support of T&E needs.	3873	898	0

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RDT&E DEFENSE-WIDE/ BA3 - Advanced Technology Development (ATD)	0603384BP CHEMICAL/BIOLOGICAL DEFENSE (ATD)	CB3		
Accomplishments/Planned Program (Cont):		FY2007	FY2008	FY2009
Detection, Lightweight Integrated CB Detection (DTO CB50) - FY 07 - Demonstrated the technology and transitioned for technology insertion into the Joint Biological Point Detection System (JBPDS) and Reconnaissance Systems as enhancements/replacement for the biological trigger systems to detect/identify chemical aerosols. Completed fabrication, and test and evaluation of brassboards. Completed DTO and transitioned to JBPDS and the Joint Biological Tactical Detection System (JBTDs).		5231	0	0
Point Detection, Biological Identification - FY 09 - Initiate prototype design and fabrication for portable whole genome sequencing of pathogens for Joint Chemical Biological Radiological Agent Water Monitor (JCBRAWM).		0	0	1494
Detection, Biological Stand-off Technology - FY 07 - Continued the development of test methodology to evaluate and assess the value of new signatures in broad regions of the electromagnetic spectrum. Assessed and evaluated the IR data from DTO CB35 and initiated prototype designs based upon this new information to enhance selectivity for interference rejection. FY 08 - Complete the development of test methodology to evaluate and assess the value of new signatures in broad regions of the electromagnetic spectrum. Complete prototype designs and initiate fabrication based upon this new information to enhance selectivity for interference rejection. FY 09 - Complete the fabrication, conduct a demonstration and transition technology to meet Joint Biological Standoff Detection System (JBSDS) Increment 2 technology based upon the new information in the IR electromagnetic spectrum from DTO CB35 to enhance selectivity for interference rejection.		7521	5912	6000
Detection, Chemical/Biological Agent Water Monitor - FY 07 - Developed a preconcentration system for chemical and biological materials to meet detection sensitivity requirements and transitioned to JCBRAWM Increment 2.		4273	0	0
Total		20898	6810	7494
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	<u>FY 2007</u>	<u>FY 2008</u>	<u>FY 2009</u>
Protection	4945	2870	2964

Accomplishments/Planned Program	FY2007	FY2008	FY2009
Protection, Advanced Air Purification Systems Model (DTO CB61) - FY 07 - Fabricated system demonstrators. Tested and validated the advanced air purification system model, then optimized for design concepts. Completed test and validation of Advanced Air Purification System Model. Completed and transitioned advanced air purification system model to Collective Protection (COLPRO) overarching model.	1650	0	0
Protection, Self-Detoxifying Materials for CB Protective Clothing (DTO CB45) - FY 07 - Optimized garment designs. Manufactured optimized prototype garments containing optimized reactive nanoparticle-loaded fabrics. Measured chemical/aerosol breakthrough of optimized garments. Conducted field-testing and assessments. Down-selected candidates. Identified technology gaps that will be addressed under BA2 Individual Protection, Integrated Protective Fabrics in FY 2008. Completed DTO and transitioned technologies to support future protective ensembles.	680	0	0
Protection, Shelter Systems and CCA/Airlock/Toxic Free Area (CCA/A/TFA) - FY 07 - Fabricated shelters using novel materials, enhanced closures, and novel ingress/egress systems and initiated assessment. Fabricated a prototype general-purpose shelter using improved textiles such as PVC/Kevlar/Polyester fabric and conducted a systems simulant test. Fabricated CCA/A/TFA prototypes and test (simulant). Conducted shelter system technology demo/testing. Results of these test identified technology gaps that will be addressed under BA2 COLPRO System Integration in FY 2008.	971	0	0
Protection, Shelter Materials, Coatings and Materials Treatments, Reactive or Self-Decontaminating - FY 07 - Applied expedient and reactive coatings to current general-purpose tent fabric as after-treatment and test. Transitioned test results to advanced development.	475	0	0

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Accomplishments/Planned Program (Cont):	FY2007	FY2008	FY2009
Protection, Improved Single-Pass Filters - FY 07 - Developed a Residual Life Indicator (RLI) prototype capable of determining the integrity, physical adsorption capacity and reaction capacity of in-service CBRN filters. Completed tracer evaluation for filter assessment of chemical reactivity capacity with chemical pulse testing and correlation development. Demonstrated subsystem hardware in current CBRN filter providing capability for determining the residual life of filter. Transitioned technology specifications to advanced development.	1169	0	0
Protection, Regenerative and Reactive Air Purification - FY 08 - Complete evaluation of the electro thermal swing adsorption (ESA) prototype. Transition ESA technology to the Joint Expeditionary Collective Protection (JECPC) system.	0	950	0
Individual Protection, Respiratory/Ocular Protection - FY 08 - Integrate the protective mask designs from BA2 efforts with developmental helmet systems to provide seamless compatibility of CB protection with ballistic protection, and integration of communication and optical systems. Initiate development of initial high fidelity prototypes for early assessment of human and operational compatibility. FY 09 - Continue integration of the protective mask designs with developmental helmet systems to provide seamless compatibility of CB protection with ballistic protection, and integration of communication and optical systems. Continue to develop initial high fidelity prototypes for early assessment of human and operational compatibility during the Future Force Warrior Demonstration in FY 10.	0	1000	1483

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Accomplishments/Planned Program (Cont):	FY2007	FY2008	FY2009
Protection, Integrated Ensemble Development - FY 08 - Initiate systems integration of a complete CB ensemble that incorporates emerging designs for comfort and performance to determine trade space for prototyping. Conduct market surveys and initiate prototype concepts from Integrated Protective Fabric, Respiratory/Ocular Protection, and Air Purification projects. FY 09 - Continue systems integration of a complete CB ensemble that incorporates emerging designs and prototype concepts from the FY 08 projects. Refine concepts for an integrated ensemble that will transition to the Joint Chemical Ensemble (JCE). Initiate field trials in a relevant environment.	0	920	1481
Total	4945	2870	2964

	<u>FY 2007</u>	<u>FY 2008</u>	<u>FY 2009</u>
Test and Evaluation (T&E)	26920	0	0

Accomplishments/Planned Program	FY2007	FY2008	FY2009
Test & Evaluation, Detection - FY 07 - Continued the development of agent to simulant correlations in support of T&E needs. Continued efforts on Measurement of Natural Interferent Transients (MONITR), critical reagent program antigen variability research, range test validation system, and chemical detector testing with NTAs. Initiated optical acceptance measurements for T&E antigens. Efforts transitioned to Project TE3 in FY 2008.	7048	0	0

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BUDGET ACTIVITY RDT&E DEFENSE-WIDE/ BA3 - Advanced Technology Development (ATD)		PE NUMBER AND TITLE 0603384BP CHEMICAL/BIOLOGICAL DEFENSE (ATD)		PROJECT CB3
Accomplishments/Planned Program (Cont):		FY2007	FY2008	FY2009
Test & Evaluation, Threat Area Science - FY 07 - Developed simulant tests and evaluation methods and procedures for non-vapor threats, e.g., aerosols, rains, and other emerging threats. Efforts transitioned to Project TE3 in FY 2008.		825	0	0
Test & Evaluation, Modeling and Simulation Battle Space Management - FY 07 - Constructed prototype model, leveraged legacy models, commenced validation, verified model via test data, prepared validation reports, and acquired accreditation for the Overarching Collective Protection (COLPRO) Model. Continued methodology development and capability of the CREATIVE decontamination efficacy prediction model and the overarching contamination avoidance model. Initiated overarching model for individual protective equipment. Efforts transitioned to Project TE3 in FY 2008.		5675	0	0
Test & Evaluation, Protection - FY 07 - Continued development of standardized collective protection shelter systems test and evaluation standards, TIC/battlefield contaminant set standards for IPE and COLPRO, real-time sampling/detector system swatch for use in Chemical and Biological Agent Resistance Test System (CBARTS), standardize procedure for IPE assessment, test methodology standards and guidance for air purification technologies, IPE field operations effect standard, and IPE air flow mapping. Efforts transitioned to Project TE3 in FY 2008.		7877	0	0
Test & Evaluation, Decontamination - FY 07 - Continued decontamination hazard byproduct and residual agent test standards and achieved low-level detection of residual agent and reaction products. Initiated test and evaluation methodology and method development for decontamination facility equipment for Dugway Proving Ground (DPG). Efforts transitioned to Project TE3 in FY 2008.		5495	0	0
Total		26920	0	0
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	<u>FY 2007</u>	<u>FY 2008</u>	<u>FY 2009</u>
SBIR/STTR	0	225	0

Accomplishments/Planned Program	FY2007	FY2008	FY2009
SBIR - FY 08 - Small Business Innovative Research.	0	225	0
Total	0	225	0

C. <u>Other Program Funding Summary:</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 Compl</u>	<u>Total Cost</u>
CA4 CONTAMINATION AVOIDANCE (ACD&P)	6936	3104	6613	22846	19722	16405	20687	Cont	Cont
DE4 DECONTAMINATION SYSTEMS (ACD&P)	991	5479	4658	0	0	0	0	0	11128
IS4 INFORMATION SYSTEMS (ACD&P)	0	0	0	0	0	3558	4801	Cont	Cont
TE3 TEST & EVALUATION (ATD)	0	25993	26668	22204	19605	15468	15362	Cont	Cont
TE4 TEST & EVALUATION (ACD&P)	1944	17149	6356	5597	5447	11833	29749	Cont	Cont
TT4 TECHBASE TECHNOLOGY TRANSITION (ACD&P)	22983	15135	17327	19101	19224	19405	19815	Cont	Cont

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COST (In Thousands)	FY 2007 Actual	FY 2008 Estimate	FY 2009 Estimate	FY 2010 Estimate	FY 2011 Estimate	FY 2012 Estimate	FY 2013 Estimate	Cost to Complete	Total Cost
CI3 CONGRESSIONAL INTEREST ITEMS (ATD)	0	64860	0	0	0	0	0	0	64860

A. Mission Description and Budget Item Justification:

Project CI3 CONGRESSIONAL INTEREST ITEMS (ATD):

B. Accomplishments/Planned Program

	<u>FY 2007</u>	<u>FY 2008</u>	<u>FY 2009</u>
Congressional Interest Items	0	63987	0

Accomplishments/Planned Program	FY2007	FY2008	FY2009
CBDP Initiative Fund Applied Research FY 08 - Solicit proposals from degree-granting universities, nonprofit organizations, or commercial concerns to include small businesses, in support of the CBDP to fund chemical and biological defense science and technology projects across a wide-range of military operations. Upon technical evaluation and selection of proposals, provide a report detailing the number of projects funded and areas of research.	0	7891	0
Fraunhofer USA Center for Molecular Biology - FY 08 - Deliver a combined multivalent one-shot vaccine that protects the Armed Forces and civilian communities against plague and anthrax.	0	987	0
Hand-held Nanotechnology Enabled Bio-Warfare Agent Identification System - FY 08 - Produce a light-weight, hand-held device defense-wide for identification of biological warfare agents.	0	2368	0

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Accomplishments/Planned Program (Cont):	FY2007	FY2008	FY2009
Long Range Stand Off System for Detection of Biological Materials.	0	1105	0
Carbon Nanotube Chemical Detector - FY 08 - Develop a chemical agent detection device based on single-walled carbon nanotube technology.	0	987	0
Surface Enhanced Infrared Detection of Threats - FY 08 - Develop a handheld biological and chemical agent detection device based on surface enhanced infrared detection methods.	0	2604	0
Small Accelerators and Detection Systems for Homeland Defense and National Security Applications.	0	1579	0
Total Perimeter Surveillance (TPS) - FY 08 - Develop a TPS capability to identify and respond to chemical and biological attacks for Defense Wide.	0	1578	0
Photo Catalytic Oxidation (PCO) Demonstration for Water Reuse - FY 08 - Develop a prototype that will remove contaminants from drinking water through photo catalysis technology.	0	1973	0
Environmental Bioterrorism Detection Program - FY 08 - Develop a comprehensive bio-surveillance monitoring system.	0	1973	0
Mobile Rapid Response Prototype - FY 08 - Continue in the partnership of Hackensack University Medical Center with the Defense Threat Reduction Agency (DTRA), the Chemical Biological & Radiological Technology Alliance.	0	3945	0
Mobile Real-time, non-specific Viral Agent Detector.	0	1480	0
Next Generation Gas Chromatographic Mass Spectrometer for WMD Civil Support Teams.	0	789	0
NIDS Automated Bio Agent Identifier.	0	2959	0
Portable Rapid Bacterial Warfare Detection Unit - FY 08 - Research and develop portable units to detect bacteriological agents in drinking water.	0	4341	0

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Accomplishments/Planned Program (Cont):		FY2007	FY2008	FY2009
Continuation of Unmanned Vehicle CBRNE Unitary Sensor Suite Development and Demonstration - FY 08 - Continue improvement and demonstration of chemical, biological, radiological, nuclear and toxic industrial material sensing technologies.		0	1578	0
UCLA High Speed and High Volume Laboratory Network for Infectious Diseases - FY 08 - Develop a "High-throughput" (meaning both high speed and high volume) laboratory and network capable of quickly analyzing and processing high quantities of biological samples, which will improve our nation's ability to respond quickly to a bio-emergency, such as a bio-terrorist attack or a flu pandemic.		0	3945	0
Myeloid Progenitor for Acute Radiation Syndrome - FY 08 - Accelerate development of CLT-008, a product offering an immediate treatment option for forward deployed military personnel who may be exposed to high doses of radiation on the battlefield.		0	2368	0
Antioxidant Micronutrient Therapeutic Countermeasures for Chemical Agents - FY 08 - Investigate animal models for efficacy of antioxidants in reducing the damage produced by chemical weapons such as sulfur mustard.		0	987	0
Anthrax Monoclonal Antibody Therapeutic and Prophylaxis Program - FY 08 - Conduct research to support safety and efficacy studies evaluating the co-administration of MDX-1303 and vaccine.		0	1579	0
Plant Vaccine Development.		0	2960	0
Advanced Emergency Medical Response Training Program.		0	1579	0
Multi-Purpose Biodefense Immunoarray.		0	987	0
Improved CBR Filters.		0	1579	0
Develop & Test Environmentally Safe Biocides for Bio-Defense - FY 08 - Develop and test new biocidal technologies for disinfection in bio-defense, environmental and marine contexts.		0	494	0
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Accomplishments/Planned Program (Cont):	FY2007	FY2008	FY2009
Regenerative Chemical Biological Filtration Systems - FY 08 - Research, develop, test and evaluate regenerative chemical biological filtration systems.	0	2466	0
Warfighter Personnel Decontamination - FY 08 - Develop decontamination products that are needed in case of chemical and biological agent attacks to military personnel and civilians.	0	789	0
Reactive Coatings Enhanced to Resist Chem/Bio Contamination.	0	1736	0
Chemical Warfare Agent Fate Model Verification and Validation Phase II.	0	987	0
Acinetobacter Baumannii Research - FY 08 - Develop therapies against pathogens of biodefense concern, including developing new medicines that allow antibiotics to overcome resistance, designing drugs that kill bacteria through novel mechanisms, and reengineering existing antibacterial drugs to defeat resistant bugs.	0	1973	0
Strategic Bioterrorism Response for Battlefield Survival - FY 08 - Develop a system, method and infrastructure, to determine if a person has been exposed to a pathogen or toxin and development of a method and device for use in a "point of care" analysis in the theater of war.	0	1421	0
Total	0	63987	0

	<u>FY 2007</u>	<u>FY 2008</u>	<u>FY 2009</u>
SBIR/STTR	0	873	0

Accomplishments/Planned Program	FY2007	FY2008	FY2009
SBIR - FY 08 - Small Business Innovative Research.	0	873	0

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Accomplishments/Planned Program (Cont):	FY2007	FY2008	FY2009
Total	0	873	0

C. Other Program Funding Summary: N/A

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COST (In Thousands)	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	Cost to	Total Cost
	Actual	Estimate	Estimate	Estimate	Estimate	Estimate	Estimate	Complete	
TB3 MEDICAL BIOLOGICAL DEFENSE (ATD)	87067	95527	252331	227287	128222	121096	112771	Continuing	Continuing

A. Mission Description and Budget Item Justification:

Project TB3 MEDICAL BIOLOGICAL DEFENSE (ATD): This project area funds preclinical development of safe and effective prophylaxes and therapies (vaccines and drugs) for pre- and post-exposures to biological threat agents. This project also supports the advanced technology development of diagnostic devices to rapidly diagnose exposure to biological agents in clinical samples. A broad range of technologies involved in the targeting and delivery of prophylactic and therapeutic medical countermeasures and diagnostic systems are evaluated in order to identify the most effective medical countermeasures against biothreats. Entry of candidate vaccines, therapeutics, and diagnostic technologies into development is facilitated by the development of technical data packages that support the Food and Drug Administration (FDA) Investigational New Drug (IND) licensure processes and DoD acquisition regulations and (as applicable) the oversight of Phase 1 clinical trials in accordance with FDA guidelines. Categories for this project area include core science and technology program areas in medical biological defense capability areas (Pretreatments, Diagnostics, Therapeutics) and directed research areas such as the Defense Technology Objectives (DTO), efforts to transition promising medical biological defense technologies from the Defense Advanced Research Projects Agency (DARPA) and the Transformational Medical Technologies Initiative (TMTI). The TMTI was launched in FY06 as a key Quadrennial Defense Review initiative to respond to the threat of emerging or intentionally bioengineered biological threats. It augments the core science and technology area by expanding the novel programs currently funded under the core Therapeutics program and introducing new technologies for developmental focus. The TMTI is a novel experiment to develop drugs that are broad spectrum in nature by using non-traditional and high risk approaches to accelerate the development and licensure of new medicines. The TMTI supports advanced technology development efforts for maturing medical countermeasures effective against intracellular pathogens and hemorrhagic fever viruses. Teaming the core program and TMTI provides a complementary strategy (single agent versus broad spectrum, conventional versus emerging threats and established model systems versus expanded integration of novel technology, respectively) towards the development of effective medical countermeasures against biothreat agents.

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B. Accomplishments/Planned Program

	<u>FY 2007</u>	<u>FY 2008</u>	<u>FY 2009</u>
Congressional Interest Items	10322	0	0

Accomplishments/Planned Program	FY2007	FY2008	FY2009
Anthrax Monoclonal Antibody Therapeutic and Prophylaxis Program - FY 07 - Refined the use of a monoclonal antibody to attempt to improve survival for anthrax exposure.	991	0	0
Plant Vaccine Development - FY 07 - Refined the development of safe and efficacious oral multi-agent vaccines from plant-based anthrax and plaque platforms and developed an immediate therapeutic treatment against Biological Warfare (BW) agent epidemics.	3120	0	0
FY 07 - Anthrax and A. Baumannii Research.	991	0	0
FY 07 - Bioterrorism Preparedness.	1159	0	0
FY 07 - Novel Viral Biowarfare Agent ID and Treatment (NOVBAIT) - Conducted development of a novel approach to anti-viral therapeutics based on high-throughput screening of compounds against intermediates of the virus capsid assembly pathway.	2971	0	0
FY 07 - Rapid Response Therapeutic Platform for Biodefense.	1090	0	0
Total	10322	0	0

	<u>FY 2007</u>	<u>FY 2008</u>	<u>FY 2009</u>
Transformational Medical Technologies Initiative	40305	60303	217313

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Accomplishments/Planned Program	FY2007	FY2008	FY2009
<p>Multiagent (Broad Spectrum) Medical Countermeasures -</p> <p>FY 07 - Expanded drug discovery efforts such as antisense RNA technology that target common bacterial virulence or house-keeping genes (pathogenicity islands, quorum-sensing molecules, siderophores, etc.). Evaluated additional therapeutic compounds and small molecule archives for potential drug interactions against common pathogenesis pathways identified from basic research efforts. Developed transgenic animal models and alternate animal model systems to better replicate the human-pathodeme, common virulence, and response pathways. Identified potential Investigational New Drug (IND) candidate drugs for development. Initiated candidate drug development phase. Expanded development of rapid re-sequencing applications and formation of bioinformatics database.</p> <p>FY 08 - Apply drug discovery efforts such as antisense RNA technology that target common bacterial virulence or house-keeping genes (pathogenicity islands, quorum-sensing molecules, siderophores, etc.). Pursue additional therapeutic compounds and small molecule archives for potential drug interactions against common pathogenesis pathways identified from basic research efforts. Validate transgenic animal models or alternate animal model systems to better replicate the human-pathodeme, common virulence, and response pathways. Continue to identify potential IND candidate drugs for development. Initiate pre-clinical phase. Initiate studies necessary to support an IND application and a Milestone A decision. File two applications for an IND with the Food and Drug Administration (FDA). Continue to expand development of rapid re-sequencing applications.</p>	40305	60303	217313

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Bullet Text (cont)	FY2007	FY2008	FY2009
FY 09 - Accelerate drug discovery efforts, incorporating new technology breakthroughs. Advance therapeutic compounds and small molecule archives for potential drug interactions against common pathogenesis pathways. Utilize transgenic animal models or alternate animal model systems to replicate the human-pathodeme, common virulence, and response pathways. Pursue test platforms for discovery, development and manufacturing technologies that allow the rapid incorporation of medical countermeasure technologies into robust and very rapid process development and manufacturing scale-up systems. Continue to accelerate platform manufacturing technologies that enable rapid regulatory approval and rapid clinical development. File two to four applications for an IND with the FDA. Initiate a Phase 1 clinical trial and studies necessary to support a Milestone B decision. Continue candidate drug development including studies to support an IND application and Milestone A decision. Apply rapid re-sequencing technology to real world samples.	40305	60303	217313
Total	40305	60303	217313

	<u>FY 2007</u>	<u>FY 2008</u>	<u>FY 2009</u>
Diagnostics	5893	7255	9152

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Accomplishments/Planned Program		FY2007	FY2008	FY2009
<p>Diagnostic Technologies -</p> <p>FY 07 - Completed study examining the Commercial off-the-shelf (COTS) Block I DNA extraction kit to automated DNA sample processors, analyzed data, and provided recommendations to the Joint Biological Agent Identification and Diagnostic System (JBAIDS) Program Office on an automated DNA extraction option for Block I. Fielded the modified COTS kit with JBAIDS Block I; kit was FDA cleared. Tested optimal matrices/tissues for diagnostic testing identified using Service assays with JBAIDS Block I assays. Used this data, along with the results of expanded inclusivity and exclusivity testing, to augment the Advanced Developer's Food and Drug Administration (FDA) assay submission packages. Investigated new recombinant DNA techniques for developing immunodiagnostic agents. Validated confirmatory tests for ricin and botulinum toxins. Completed study assessing the use of whole genome amplification and a microelectronic array. Validated multiplexed assays identifying RNA viruses on existing platforms. Applied a Defense Advanced Research Projects Agency (DARPA) transitioned broad range pathogen detection system capable of potentially identifying genetically engineered bacterial strains. Utilized proteomics data to develop and test immunologic assays for bioagent detection. Performed advanced testing on components and platforms for next generation diagnostic devices with an emphasis on integration of sample processing and nucleic acid and immunodiagnostic testing.</p> <p>FY 08 - Continue to test optimal matrices/tissues for diagnostic testing identified using Service assays with JBAIDS Block I assays. Use this data, along with the results of expanded inclusivity and exclusivity testing, to augment the Advanced Developer's FDA assay submission packages. Apply new recombinant DNA techniques for developing immunodiagnostic agents. Adapt real time Polymerase Chain Reaction (PCR) assays identifying genes responsible for antibiotic resistance in biothreat agents to applicable instrumentation. Assess enhanced sensitivity of surface amplification methods for microarray platforms. Critically analyze/apply the results of the decision matrix to developmental testing of next generation diagnostic devices with emphasis on technologies capable of integrating sample processing, nucleic acid and immunodiagnostic testing. Accelerate development and testing of next generation diagnostic devices with the goal of transitioning two candidates to the advanced developer in FY 09.</p>		4093	7255	9152
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Bullet Text (cont)	FY2007	FY2008	FY2009
FY 09 - Transition two candidates for a next generation diagnostic device to the advanced developer. Continue to utilize the decision matrix to identify and evaluate new technologies more effectively diagnosing exposure to biothreat agents. Validate real time PCR assays identifying genes responsible for antibiotic resistance in biothreat agents. Perform advanced assessment on the use of recombinant DNA reagents on existing systems and improved test assays utilizing new technologies and approaches that enhance diagnosis of early exposure to biothreat agents.	4093	7255	9152
Diagnostics, Methodology to Facilitate Development of Biological Warfare Threat Agent Detection and Medical Diagnostic Systems (DTO CB56) - FY 07 - Delivered eleven new additional nucleic acid detection/diagnostic assays and/or supporting reagents to the advanced developer with priority for JBAIDS assays. Delivered four new additional antigen detection assays and supporting reagents to the advanced developer. Completed DTO CB56.	1800	0	0
Total	5893	7255	9152

	<u>FY 2007</u>	<u>FY 2008</u>	<u>FY 2009</u>
Pretreatments	11452	12702	10208

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Accomplishments/Planned Program		FY2007	FY2008	FY2009
<p>Pretreatments, Vaccine Research Support -</p> <p>FY 07 - Conducted animal studies of selected vaccine candidates against bacterial threat agents. Expanded challenge studies against selected intracellular pathogen candidate vaccines. Initiated optimization of new generation intracellular pathogen vaccines, and considered alternative adjuvant formulations, routes of administration, and dosage schedules. Developed surrogate endpoints of clinical efficacy for higher animal species in ricin vaccine adjuvant studies. Pursued recombinant ricin vaccine candidate stability testing and initiated toxicity studies. Studied the vascular leak peptide in novel and current ricin vaccine candidates. Evaluated the Venezuelan Equine Encephalitis (VEE) replicon-based Marburg virus vaccine platform in non-human primate efficacy studies. Studied adenovirus-based and rhabdovirus-based immunization approaches for vaccination against filoviruses. Started down-selection phase of the various filovirus vaccine candidate platforms and evaluated alternative forms of delivery for comparative evaluation of vaccine efficacy.</p> <p>FY 08 - Complete non-human primate efficacy studies for toxin vaccines. Down-select filovirus vaccine candidates; continue safety and efficacy studies in non-human primates; begin duration of immunity studies; initiate stability testing. Evaluate pan-filovirus vaccines for problems of vaccine interference between components.</p> <p>FY 09 - Further characterize safety, toxicity and duration of immunity studies in non-human primates for filovirus vaccines; optimize dose, route and/or regimen for maximum efficacy. Assess multiagent alphavirus and filovirus vaccines for issues of vaccine interference. Conduct stability and toxicity studies for lead alphavirus vaccine candidates. Complete stability and toxicity studies for toxin vaccines; prepare cGMP production lots; begin IND preparation for Food and Drug Administration (FDA) evaluation. Analyze efficacy, duration of immunity, dosing regimens of second generation vaccine against bacterial pathogens (including anthrax, plague, tularensis).</p>		8098	8007	7886
Pretreatments, Multiagent Vaccines, Western and Eastern Equine Encephalitis (WEE/EEE) Vaccine Constructs for a Combined Encephalitis Vaccine (DTO CB58) -		2978	2887	0
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Bullet Text (cont)	FY2007	FY2008	FY2009
<p>FY 07 - Finalized the evaluation of promising WEE/EEE vaccine candidates in higher animal species against EEE or WEE virus challenge. Conducted duration of immunity studies with lead candidates for each platform, comparing the individual constructs and trivalent formulations. Evaluated results of recent clinical trial study and inactivated the V3526 vaccine candidate. Developed non human primate (NHP) models of aerosol exposure to all alphaviruses.</p> <p>FY 08 - Complete duration of immunity studies for each platform, comparing individual constructs and trivalent formulations. Initiate studies to address the issue of interference between vaccine components and the immune response. Conclude safety and efficacy studies in animal models. Down-select alphavirus vaccine candidates. DTO CB58 will be completed in FY 2008.</p>	2978	2887	0
<p>Pretreatments, Multiagent Vaccines (Formerly Resuscitative Intervention) -</p> <p>FY 07 - Infected guinea pigs and different NHPs via aerosol with different strains of filovirus, and determined lethal dose, viral pathogenesis, and host immune response in support of the design and advanced development of a pan-filovirus vaccine.</p> <p>FY 08 - Evaluate safety and efficacy of anthrax/plague/toxin vaccine in large animals. Examine the effects of a CpG motif oligonucleotides (CpG ODN) adjuvant in NHPs.</p> <p>FY 09 - Evaluate safety and efficacy of multi-agent vaccines (e.g., anthrax/plague/melioidosis); complete studies to determine interference between vaccine components and the immune response; conduct duration of immunity studies. Down-select multiagent vaccine platforms; determine dosage and route of entry.</p>	376	1808	2322
Total	11452	12702	10208

	<u>FY 2007</u>	<u>FY 2008</u>	<u>FY 2009</u>
Therapeutics	19095	14098	15658

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BUDGET ACTIVITY RDT&E DEFENSE-WIDE/ BA3 - Advanced Technology Development (ATD)	PE NUMBER AND TITLE 0603384BP CHEMICAL/BIOLOGICAL DEFENSE (ATD)	PROJECT TB3
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Accomplishments/Planned Program	FY2007	FY2008	FY2009
<p>Therapeutics, Therapy for Ebola and Marburg Virus Infections (DTO CB67) -</p> <p>FY 07 - Designed studies to compare the utility of therapeutic technologies against Ebola and Marburg viruses in animal models, considering FDA requirements for licensure under the animal rule. Technologies include antisense oligonucleotides, recombinant human monoclonal antibodies, small interfering RNAs (siRNA), small molecules, and therapeutic vaccines.</p> <p>FY 08 - Initiate testing in relevant small and large animal models to support Investigational New Drug (IND) submission and FDA licensure under the animal rule. Down-select leading technologies based on results from animal studies, in coordination with the advanced developer.</p> <p>FY 09 - Continue pivotal testing to support IND submission and transition of a nucleic acid based filovirus therapeutic to the advanced developer. Initiate FDA required studies to support the preclinical development and characterization of other leading therapeutic technologies against the Ebola virus and Marburg virus.</p>	3264	5097	5591

<p>Project TB3/Line No: 033</p> <p align="center">Page 35 of 59 Pages</p> <p align="right">Exhibit R-2a (PE 0603384BP)</p>
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BUDGET ACTIVITY RDT&E DEFENSE-WIDE/ BA3 - Advanced Technology Development (ATD)		PE NUMBER AND TITLE 0603384BP CHEMICAL/BIOLOGICAL DEFENSE (ATD)		PROJECT TB3
Accomplishments/Planned Program (Cont):		FY2007	FY2008	FY2009
<p>Therapeutics, Viral -</p> <p>FY 07 - Tested leading antivirals in appropriate, existing animal models and worst-case scenarios such as viral challenge dose, route, and variation in viral challenge strain, considering FDA requirements for product licensure under the animal rule. Conducted studies to support FDA licensure and manufacturing with lead compounds, leading up to milestone approval and transition. Expanded the effort to develop a treatment algorithm for severe Ebola infection.</p> <p>FY 08 - Initiate animal studies, as lead antiviral compounds effective against conventional threats are identified, to support FDA submissions, milestone approval, and product transition to advanced development. Complete development of a treatment algorithm for severe Ebola infection. Continue studies to develop two oral therapeutics for orthopox viruses, transitioned from DTO CB54. Conduct FDA required non-human primate studies required to support FDA licensure of two oral therapeutics for orthopox virus infection.</p> <p>FY 09 - Begin studies to support FDA submissions, milestone approval, and product transition to advanced development. Complete FDA required non-human primate studies required to complete development of two oral therapeutics for orthopox viral infection.</p>		4364	5360	5885
<p>Therapeutics, Bacterial -</p> <p>FY 07 - Evaluated newly discovered and newly approved compounds with antibacterial activity for safety and efficacy against multiple bacterial threat agents in non-human primates and other appropriate animal models.</p> <p>FY 08 - Conduct advanced safety and efficacy studies in non-human primates, considering FDA requirements for licensure of new therapeutics and approved therapeutics with a new indication. Efforts will be coordinated with the advanced developer to ensure the appropriate studies are conducted.</p> <p>FY 09 - Initiate advanced safety and efficacy studies for a nanobody based immunotherapeutic against plague. Conduct advanced safety and efficacy studies for broad spectrum antibacterials considering FDA requirements for licensure under the animal rule. Down select antimicrobial peptide therapeutic candidates and initiate studies to support FDA submissions.</p>		3767	2330	2478
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Accomplishments/Planned Program (Cont):	FY2007	FY2008	FY2009
<p>Therapeutics, Toxin -</p> <p>FY 07 - Demonstrated in vivo suitable delivery systems for lead candidate compounds. Initiated evaluation of lead candidates in animal models acceptable for approval under the FDA animal rule.</p> <p>FY 08 - Evaluate lead compounds in support of FDA submissions, milestone approval, and future transition to advanced development. Develop therapeutic delivery systems in accordance with FDA requirements.</p> <p>FY 09 - Consider FDA requirements for developing botulinum neurotoxin (BoNT) therapeutics with the potential to restore synaptic activity following neuromuscular paralysis due to intoxication, and plan initial studies to support these requirements.</p>	5480	1311	1704
<p>Therapeutics, Resuscitative Intervention -</p> <p>FY 07 - Continued screening available technologies being developed for "golden hour" treatment of combat casualties against current medical countermeasures for nerve agent pre-treatment and therapy for drug interaction effects. Modeled patient physiological response to chemical (nerve) agent in silico to establish treatment response guidelines and to assist in evaluation of drug interaction effects.</p>	2220	0	0
Total	19095	14098	15658

	<u>FY 2007</u>	<u>FY 2008</u>	<u>FY 2009</u>
SBIR/STTR	0	1169	0

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BUDGET ACTIVITY RDT&E DEFENSE-WIDE/ BA3 - Advanced Technology Development (ATD)	PE NUMBER AND TITLE 0603384BP CHEMICAL/BIOLOGICAL DEFENSE (ATD)	PROJECT TB3
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Accomplishments/Planned Program	FY2007	FY2008	FY2009
SBIR - FY 08 - Small Business Innovative Research.	0	1169	0
Total	0	1169	0

C. <u>Other Program Funding Summary:</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 Compl</u>	<u>Total Cost</u>
MB4 MEDICAL BIOLOGICAL DEFENSE (ACD&P)	25832	1600	0	121511	138459	132693	132767	Cont	Cont
MB5 MEDICAL BIOLOGICAL DEFENSE (SDD)	56304	73789	89674	57052	159391	142096	141174	Cont	Cont

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BUDGET ACTIVITY RDT&E DEFENSE-WIDE/ BA3 - Advanced Technology Development (ATD)	PE NUMBER AND TITLE 0603384BP CHEMICAL/BIOLOGICAL DEFENSE (ATD)	PROJECT TC3
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COST (In Thousands)	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	Cost to	Total Cost
	Actual	Estimate	Estimate	Estimate	Estimate	Estimate	Estimate	Complete	
TC3 MEDICAL CHEMICAL DEFENSE (ATD)	15740	28726	26567	28961	30493	31539	31836	Continuing	Continuing

A. Mission Description and Budget Item Justification:

Project TC3 MEDICAL CHEMICAL DEFENSE (ATD): This project supports the investigation of new medical countermeasures to include prophylaxes, pretreatments, antidotes, skin decontaminants and therapeutic drugs to protect U.S. forces against known and emerging chemical warfare threat agents. Capabilities are maintained for reformulation, formulation, and scale-up of candidate compounds using current good laboratory practices. Analytical stability studies, safety and efficacy screening, and preclinical toxicology studies are performed prior to full-scale development of promising pretreatment or treatment drug compounds. Entry of candidate pretreatment/prophylaxes, therapeutics, and diagnostic technologies into development is facilitated by the development of technical data packages that support the Food and Drug Administration (FDA) Investigational New Drug (IND) application and licensure processes and DoD acquisition regulations. Categories for this project include Defense Technology Objectives (DTOs), science and technology program areas in medical chemical defense capability areas (Pretreatments, Diagnostics, Therapeutics and Emerging Threats), and directed research efforts (Low Level Chemical Warfare (CW) agent exposure and Non-Traditional Agents (NTAs)).

B. Accomplishments/Planned Program

	<u>FY 2007</u>	<u>FY 2008</u>	<u>FY 2009</u>
Congressional Interest Items	1337	0	0

Accomplishments/Planned Program	FY2007	FY2008	FY2009
FY 07 - Antioxidant Micronutrient Therapeutic Countermeasures for Chemical Agents.	1337	0	0
Total	1337	0	0

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BUDGET ACTIVITY RDT&E DEFENSE-WIDE/ BA3 - Advanced Technology Development (ATD)	PE NUMBER AND TITLE 0603384BP CHEMICAL/BIOLOGICAL DEFENSE (ATD)	PROJECT TC3
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	<u>FY 2007</u>	<u>FY 2008</u>	<u>FY 2009</u>
Diagnostics	566	671	710

Accomplishments/Planned Program	FY2007	FY2008	FY2009
<p>Diagnostic Technologies -</p> <p>FY 07 - Validated improved/novel assays against standard assays published in the standard Technical Bulletin MED 296. Accelerated advanced research experiments aimed at transitioning detection methods in clinical samples for metabolites, adducts and/or other relevant biomarkers resulting from CWA exposure. Conducted further animal studies to validate assays for detecting biomarkers of CWA exposure in biological samples. Completed automation/high throughput instrument validation for the DoD-developed whole blood cholinesterase assay for organophosphate exposure; completed normal baseline and variability studies; collated marker studies; expanded efforts to adapt method to a hand-held, field deployable device allowing immediate evaluation of exposure to nerve agents, pesticides and other organophosphates. Initiated studies to incorporate an internal standard to improve the fluoride reactivation assay. Performed in vitro studies to optimize the sulfur mustard blood protein assay.</p> <p>FY 08 - Perform method validation studies for the improved fluoride reactivation method and initiate in vivo animal model exposure tests to characterize the assay. Continue metabolic profile (metabonomic) studies in animal exposure models by examining blood from agent exposed guinea pigs and assess feasibility as a potential diagnostic technique. Initiate method validation for optimized sulfur mustard blood protein assay. Perform GLP studies on DoD developed whole blood cholinesterase assay.</p> <p>FY 09 - Conclude validation of the optimized sulfur mustard blood protein assay. Initiate validation of the beta-lyase urinary metabolite assay. Conclude metabonomics study and conduct data analysis. Complete validation of procedure to assess the presence of chemical warfare analytes from hair samples.</p>	566	671	710
Total	566	671	710

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BUDGET ACTIVITY RDT&E DEFENSE-WIDE/ BA3 - Advanced Technology Development (ATD)	PE NUMBER AND TITLE 0603384BP CHEMICAL/BIOLOGICAL DEFENSE (ATD)	PROJECT TC3
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	<u>FY 2007</u>	<u>FY 2008</u>	<u>FY 2009</u>
Pretreatments	5331	7807	6732

Accomplishments/Planned Program	FY2007	FY2008	FY2009
<p>Pretreatments, Nerve Agent, Bioscavengers -</p> <p>FY 07 - Expanded recombinant and catalytic bioscavenger efficacy, immunogenicity, and stability studies. Provided supportive studies for IND submission for recombinant bioscavenger candidate (Increment 1). Evaluated in vivo expression systems for bioscavenger delivery. Continued and expanded structural studies of potential catalytic bioscavengers, including human carboxylesterase (CaE) and paraoxonase 1 (PON-1). Extended animal model evaluation, significantly reduced immunogenicity and efficacy studies of recombinant and catalytic bioscavengers. Utilized recombinant bioscavenger molecules in homologous animal model systems to evaluate stability and immunogenicity. Pursued development of Physiologically Based Pharmacokinetic (PBPK) models that predict efficacy of bioscavengers in non-human primates.</p> <p>FY 08 - Complete all remaining supportive studies for recombinant bioscavenger candidate (Increment 2). Continue to evaluate in vivo expression systems for bioscavenger delivery. Pursue structural studies of potential catalytic bioscavengers, including CaE and PON-1. Optimize PBPK models that predict efficacy of bioscavengers in NHPs. Conduct efficacy studies of catalytic bioscavenger molecules.</p> <p>FY 09 - Optimize in vivo expression systems for bioscavenger delivery. Complete structural studies of potential catalytic bioscavengers, such as CaE and PON-1. Utilize PBPK models that predict efficacy of bioscavengers in NHPs for novel catalytic bioscavenger molecules. Evaluate catalytic bioscavenger molecules for safety, efficacy, stability and immunogenicity.</p>	5331	7807	6732
Total	5331	7807	6732

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	<u>FY 2007</u>	<u>FY 2008</u>	<u>FY 2009</u>
Therapeutics	8506	19903	19125

Accomplishments/Planned Program	FY2007	FY2008	FY2009
<p>Therapeutics, Cutaneous and Ocular -</p> <p>FY 07 - Initiated pivotal animal efficacy studies for wound healing products, according to Food and Drug Administration (FDA) licensure requirements. Evaluated alternative candidate skin barrier cream formulations in comparison with fielded countermeasure Skin Exposure Reduction Paste Against Chemical Warfare Agents (SERPACWA).</p> <p>FY 08 - Continue pivotal studies to support FDA licensure of wound healing products and antivesicants. Optimize dosing schemes, evaluate pharmacokinetics, and refine approaches for potential human use. Down-select new decontamination formulations and evaluate for efficacy in compliance with FDA regulations.</p> <p>FY 09 - Initiate NHP studies to determine long term effects of down-selected wound healing products and vesicant agents, in coordination with the advanced developer.</p>	2729	4063	3933

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Accomplishments/Planned Program (Cont):	FY2007	FY2008	FY2009
<p>Therapeutics, Neurologic -</p> <p>FY 07 - Established pharmacokinetic and pharmacodynamic parameters of treatment to determine threshold therapeutic drug levels. Refined compound synthesis and selection. Performed neurobehavioral assessment of promising candidate products in the appropriate models.</p> <p>FY 08 - Test novel and FDA approved neuroprotectants for neuroprotective activity against nerve agents in one or more animal models, with a focus on requirements to support FDA submissions under the animal rule. Initiate safety/side effect/dosing and pharmacokinetic evaluation of new compounds.</p> <p>FY 09 - Accelerate efforts to evaluate novel and FDA approved anticonvulsants, neuroprotectants, anti-epileptics, and receptor agonists and antagonists for neuroprotective activity against nerve agents in animal models, including non-human primates, according to FDA requirements, as candidates become available.</p>	2620	11793	11242
<p>Therapeutics, Medical Toxicology - Non-Traditional Agents (NTAs) and Other agents -</p> <p>FY 07 - Planned improved strategies for extrapolating NTA exposure hazards for human risk assessment utilizing existing and developing computational methods.</p> <p>FY 08 - Verify and validate new generation computational tools for predictive modeling.</p> <p>FY 09 - Develop and validate practical clinical strategies to aid in management of NTA casualties.</p>	2000	3047	2950

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BUDGET ACTIVITY RDT&E DEFENSE-WIDE/ BA3 - Advanced Technology Development (ATD)	PE NUMBER AND TITLE 0603384BP CHEMICAL/BIOLOGICAL DEFENSE (ATD)	PROJECT TC3
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Accomplishments/Planned Program (Cont):	FY2007	FY2008	FY2009
Therapeutics, Chemical Warfare Agent Operational Exposure Hazard Assessment Research (DTO CB69) - FY 07 - Extrapolated relevant experimental effects to determine post-exposure health problems that may impact subsequent operational readiness. Designed and executed studies to generate scientifically valid data to serve as a basis for reducing the error in health risk assessment predictions for useful military Operational Risk Management (ORM) decisions. FY 08 - Conduct toxicokinetic modeling to support animal-to-human extrapolations of toxicity and to predict toxicity with various routes and durations of exposure. FY 09 - Complete data analysis and deliver dataset to define the operational effects from chemical agent contact and inhalation exposure. Complete DTO CB69.	1157	1000	1000
Total	8506	19903	19125

	<u>FY 2007</u>	<u>FY 2008</u>	<u>FY 2009</u>
SBIR/STTR	0	345	0

Accomplishments/Planned Program	FY2007	FY2008	FY2009
SBIR - FY 08 - Small Business Innovative Research.	0	345	0
Total	0	345	0

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BUDGET ACTIVITY RDT&E DEFENSE-WIDE/ BA3 - Advanced Technology Development (ATD)	PE NUMBER AND TITLE 0603384BP CHEMICAL/BIOLOGICAL DEFENSE (ATD)	PROJECT TC3
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C. <u>Other Program Funding Summary:</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 Compl</u>	<u>Total Cost</u>
MC4 MEDICAL CHEMICAL DEFENSE (ACD&P)	31580	14425	8181	0	0	0	0	0	54186
MC5 MEDICAL CHEMICAL DEFENSE (SDD)	4832	21209	22128	16163	18722	17576	12060	Cont	Cont

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COST (In Thousands)	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	Cost to	Total Cost
	Actual	Estimate	Estimate	Estimate	Estimate	Estimate	Estimate	Complete	
TE3 TEST & EVALUATION (ATD)	0	25993	26668	22204	19605	15468	15362	Continuing	Continuing

A. Mission Description and Budget Item Justification:

Project TE3 TEST & EVALUATION (ATD): This funding supports the development of test and evaluation methodologies and protocols as new science and technology efforts are discovered that support developmental/operational testing. It includes the coordination of methodology development within a CBDP T&E Investment Strategy and the ongoing development of requirements for S&T infrastructure core capabilities. These new methodologies and testing capabilities include the development of simulants and stimulants. Projects under this item were previously reported in CB3 Test and Evaluation.

B. Accomplishments/Planned Program

	<u>FY 2007</u>	<u>FY 2008</u>	<u>FY 2009</u>
Test and Evaluation (T&E)	0	25688	26668

Accomplishments/Planned Program	FY2007	FY2008	FY2009
Test and Evaluation, Detection - FY 08 - Transition critical reagent program antigen variability research to Biosafety Level (BSL)-2 and BSL-3 production facilities. Complete and transition DoD standard for background interferent references and test procedures. Complete range test validation system. Continue previous effort in optical acceptance measurement for test and evaluation antigens. FY 09 - Complete optical acceptance measurement for test and evaluation antigens. Initiate development of methodologies and capabilities for test and evaluation of technologies currently in early stages of tech-base development.	0	7666	7550

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Accomplishments/Planned Program (Cont):	FY2007	FY2008	FY2009
<p>Test and Evaluation, Threat Agent Science -</p> <p>FY 08 - Incorporate non-traditional agent (NTA) data to define and develop improved NTA simulants that will address test and evaluation needs. Identify requirements for and initiate development of new simulants for CB warfare agents for use in test and evaluation efforts. Conduct experiments, scale-up commercially available biopesticidal virus preparation and transition methods and reagents to Critical Reagent Program. Evaluate simulants developed to reflect masking/encapsulation technology used with CB agents. Evaluate standard protocols and analyze results from the hazard assessment and correlation studies.</p> <p>FY 09 - Continue development of simulants for specified NTAs to be used in test and evaluation efforts. Complete standard protocol evaluation. Continue development of masking/encapsulation simulants for CB agents.</p>	0	3410	3891
<p>Test and Evaluation, Information System Technology -</p> <p>FY 08 - Complete and deliver verified and validated overarching contamination avoidance model. Complete and deliver verified and validated overarching decontamination model. Complete and deliver verified and validated collective protection model. Develop support models for overarching individual protection model using requirements and existing models.</p> <p>FY 09 - Assemble support models into an overarching individual protection model architecture. Complete development and transition of overarching test and evaluation models. Initiate requirements analysis for future modeling needs.</p>	0	3508	3825

<p>Project TE3/Line No: 033</p> <p align="center">Page 48 of 59 Pages</p> <p align="right">Exhibit R-2a (PE 0603384BP)</p>
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Accomplishments/Planned Program (Cont):	FY2007	FY2008	FY2009
Test and Evaluation, Protection - FY 08 - Complete development of collective protection shelter systems test and evaluation standards, Toxic Industrial Chemicals (TIC)/battlefield contaminant standards for Individual Protection Equipment (IPE) and Collective Protection (COLPRO). Complete standard procedures for IPE Assessment. Continue real-time sampling/detector system swatch test methodology for use in Chemical and Biological Agent Resistance Test System (CBARTS), test methodology standards and guidance for air purification technologies, IPE field operations effects standard, and IPE air flow mapping. FY 09 - Complete real-time sampling/detector system swatch test methodology for use in CBARTS, test methodology standards and guidance for air purification technologies, IPE field operations effects standard, and IPE air flow mapping.	0	9529	9992
Test and Evaluation, Decontamination - FY 08 - Complete decontamination hazard byproduct and residual agent test standards and low level detection of residual agents in reaction products and deliver standard test methods to Service laboratories and other supporting test laboratories. Complete test protocols for decontamination hazard byproduct and residual test standards and write and publish test operations procedures. FY 09 - Initiate test and evaluation methodologies and protocols for assessing reactivity of alternative reactive material technologies and processes.	0	1575	1410
Total	0	25688	26668

	<u>FY 2007</u>	<u>FY 2008</u>	<u>FY 2009</u>
SBIR/STTR	0	305	0

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Accomplishments/Planned Program	FY2007	FY2008	FY2009
SBIR - FY 08 - Small Business Innovative Research.	0	305	0
Total	0	305	0

C. <u>Other Program Funding Summary:</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 Compl</u>	<u>Total Cost</u>
TE4 TEST & EVALUATION (ACD&P)	1944	17149	6356	5597	5447	11833	29749	Cont	Cont
TE5 TEST & EVALUATION (SDD)	17631	45302	42141	37270	15341	14868	4799	Cont	Cont
TE7 TEST & EVALUATION (OP SYS DEV)	0	6973	7142	6860	8018	8157	8158	Cont	Cont

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COST (In Thousands)	FY 2007 Actual	FY 2008 Estimate	FY 2009 Estimate	FY 2010 Estimate	FY 2011 Estimate	FY 2012 Estimate	FY 2013 Estimate	Cost to Complete	Total Cost
TR3 MEDICAL RADIOLOGICAL DEFENSE (ATD)	1995	2169	4878	2466	986	0	0	0	12494

A. Mission Description and Budget Item Justification:

Project TR3 MEDICAL RADIOLOGICAL DEFENSE (ATD): This area funds advanced technology development (ATD) of medical countermeasures against radiological and nuclear threats. Program objectives focus on mitigating the health consequences from exposures to external ionizing radiation and internalized alpha- and beta-particles as well as gamma-emitting radionuclides which would represent a significant threat to US forces. Following down-selection, pertinent S&T data will be used to support Investigational New Drug (IND) applications and Food and Drug Administration (FDA) licensure processes.

B. Accomplishments/Planned Program

	<u>FY 2007</u>	<u>FY 2008</u>	<u>FY 2009</u>
Radiological Medical Countermeasures	1995	2142	4878

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Accomplishments/Planned Program		FY2007	FY2008	FY2009
<p>Radiation Medical Countermeasures -</p> <p>FY 07 - Explored new promising candidate drugs found to have a radiological treatment dose efficacy expressed as dose-reduction factor (DRF) of 1.20 or greater in rodents. Initiated preclinical efficacy studies in non-human primates (NHPs) to include non-clinical toxicological and pharmacokinetic analysis, assessment of drug mechanism, and initial determination of formulation. Explored products and regimens that mitigate and/or treat radiation injury post-exposure, with emphasis on broad activity, ease of administration, and safety. Initiated study for promising radioprotectants that prevent/mitigate post-radiation exposure such as cytokines, broad spectrum antibiotics, and anti-apoptotic and/or decoporating agents.</p> <p>FY 08 - Evaluate three to four promising drug candidates with a DRF of 1.20 or greater in rodents. Initiate evaluation of the efficacy in non-human primates (NHP) for non-clinical toxicological, pharmacokinetic and pharmacodynamic analysis, assessment of drug mechanism of action and initial determination of formulation. Initiate evaluation of products and regimens that mitigate and/or treat post-exposure radiological injury, with emphasis on broad spectrum activity, ease of administration, and safety. Initiate evaluation for additional promising radioprotectant prophylaxis and post-exposure therapeutic agents that prevent/mitigate post-irradiation exposure such as cytokines, broad spectrum antibiotics, and anti-apoptotic and/or decoporating agents.</p> <p>FY 09 - Continue to evaluate at least two promising candidate drugs found to have a DRF of 1.20 or greater in rodents. Evaluate efficacy of three to four candidate products and regimens that mitigate and/or treat post-exposure radiological injury, with emphasis on broad spectrum activity (hematopoietic, respiratory and GI systems), ease of administration, and safety in NHPs. Continue to evaluate the preclinical efficacy studies in NHPs to include non-clinical toxicological, pharmacokinetic and pharmacodynamic analysis, assessment of drug mechanism of action, and drug determination of formulation according to the Food and Drug Administration (FDA) two-animal efficacy rule. Evaluate promising radioprotectants and post-exposure therapeutic agents that prevent/mitigate post-radiation exposure such as cytokines, broad spectrum antibiotics, and anti-apoptotic and/or decoporating agents.</p>		1995	2142	4878
Total		1995	2142	4878
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	<u>FY 2007</u>	<u>FY 2008</u>	<u>FY 2009</u>
SBIR/STTR	0	27	0

Accomplishments/Planned Program	FY2007	FY2008	FY2009
SBIR - FY 08 - Small Business Innovative Research.	0	27	0
Total	0	27	0

C. <u>Other Program Funding Summary:</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 Compl</u>	<u>Total Cost</u>
MR4 MEDICAL RADIOLOGICAL DEFENSE	8776	7066	8156	2478	0	0	0	0	26476

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BUDGET ACTIVITY RDT&E DEFENSE-WIDE/ BA3 - Advanced Technology Development (ATD)	PE NUMBER AND TITLE 0603384BP CHEMICAL/BIOLOGICAL DEFENSE (ATD)	PROJECT TT3
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COST (In Thousands)	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	Cost to	Total Cost
	Actual	Estimate	Estimate	Estimate	Estimate	Estimate	Estimate	Complete	
TT3 TECHBASE TECHNOLOGY TRANSITION	15616	7817	8241	8389	8253	9343	9445	Continuing	Continuing

A. Mission Description and Budget Item Justification:

Project TT3 TECHBASE TECHNOLOGY TRANSITION: This project supports technology transition efforts. These efforts test and demonstrate technologies being developed for transition from the Joint Science and Technology Office for Chemical and Biological Defense (JSTO-CBD) to the Joint Program Executive Office for Chemical and Biological Defense (JPEO-CBD) and other acquisition programs requiring CB defense technologies. This project, initiated in FY06, was funded by realignment of funds previously in BA6, Anti Terrorism; BA3, CB3 funds for Technology Readiness Evaluations; BA3, CP3 funds for Counter Proliferation Support Program, Advanced Concept Technology Demonstration (ACTD) Planning and Development; and BA3, CM3 Homeland Defense, Weapons of Mass Destruction Civil Support Teams (WMD-CSTs). The WMD-CST program funds Pre-Systems Acquisition in support of Consequence Management teams around the nation. The Force Protection program demonstrates and tests technology for Force Protection/Installation Protection and specifically for PM Guardian's Installation Protection Program. Both the WMD-CST and Force Protection programs are in support of Homeland Defense initiatives. The Technology Transition program supports Advanced Technology Demonstrations and planning for Advanced Concept Technology Demonstrations. The Technology Readiness Assessment program provides for assessment of mature technologies demonstrating the potential to fulfill user requirements.

B. Accomplishments/Planned Program

	<u>FY 2007</u>	<u>FY 2008</u>	<u>FY 2009</u>
Congressional Interest Items	3380	0	0

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Accomplishments/Planned Program		FY2007	FY2008	FY2009
FY 07 - Initiated Unmanned Portable C/B Detect Sensor System. This effort will develop novel CB sensors for early warning monitoring and their integration onto unmanned robotic platforms and navigation and guidance algorithms for mine clearing/IEDs/bio-hazards in GPS-denied areas using unmanned ground vehicle robots.		1585	0	0
FY 07 - Chemical/Biological Defense Program - Advanced Development.		1795	0	0
Total		3380	0	0
		<u>FY 2007</u>	<u>FY 2008</u>	<u>FY 2009</u>
Experiment & Technology Demonstrations		5844	5310	5536
Accomplishments/Planned Program		FY2007	FY2008	FY2009
FY 07 - Military Applications in Reconnaissance and Surveillance (MARS) - Continued Unattended Ground Sensors (UGS) program testing of CBRN detection technologies for use on one-man portable UGSs. Biological detection ATD initiated and transitioned to BA4 funding under Expeditionary Biological Detection ATD. Conducted MARS Manned/Unmanned Aerial Vehicle (M/UAV) program testing of CBRN detection technologies for use on small UAVs dedicated to CBRN passive defense or CBRN consequence management, reconnaissance and surveillance applications. Initiated development of the aerial CBRN test methodology. Initiated a Limited Objective Experiment (LOE) for Special Platform Interior Decontamination and Equipment Remediation (SPIDER), by testing vaporous decontamination on designated aircraft material to confirm compatibility and by developing a technical order for the decontamination of designated aircraft using the vaporous decontamination process. Initiated technical testing to confirm biological agent kill. Performed candidate technology maturation testing in preparation for FY 09 ATD candidate, SPIDER. Initiated aircraft interior biological remediation project. Initiated Automated Decontamination studies to explore new concepts for field decontamination. Started a coalition CBRN Information Interoperability study.		5844	5310	5536
Project TT3/Line No: 033		Page 56 of 59 Pages	Exhibit R-2a (PE 0603384BP)	

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Bullet Text (cont)		FY2007	FY2008	FY2009
<p>FY 08 - Perform candidate technology maturation testing in SPIDER in preparation for a FY 09 ATD candidate. Perform candidate technology maturation testing in preparation for a FY 09 ATD candidate, Advanced Remediation Technologies (ART). Continue technology evaluations and gap analysis for Interagency Biological Remediation Demonstration (IBRD). Initiate an evaluation of early warning technologies to improve capability to detect and react to initial CB attack and prevent a second attack.</p> <p>FY 09 - Analyze the capability of current- and near-term early warning technologies that may either be capable of or are required to sense CB attacks. Complete candidate technology maturation testing in preparation for a FY 2009 ATD candidate for ART. Perform candidate technology maturation testing in preparation for a FY 10 ATD candidate. Continue testing of candidate technologies for ART and CBRN capability insertion into non CBDP platforms, systems and programs of record.</p>		5844	5310	5536
Total		5844	5310	5536
		<u>FY 2007</u>	<u>FY 2008</u>	<u>FY 2009</u>
Homeland Defense		3777	0	0
Accomplishments/Planned Program		FY2007	FY2008	FY2009
<p>FY 07 - Conducted reach-back capability study to identify significant CBRNE reach-back requirements and resources of DoD components and Federal, State and local agencies for Weapons of Mass Destruction Civil Support Teams (WMD-CSTs). Completed operational testing and Homeland Defense Demonstrations for WMD-CSTs. Completed the transition of technologies tested in FY06 processes thru the JPEO-CBD Non-Standard Equipment Review Panel (NSERP) process. Initiated coordination and development of the Interagency Biological Remediation Demonstration (I-BRD). IBRD is a DoD-DHS cooperative program focused on providing a coordinated systems approach to the recovery and restoration of wide-urban areas, to include DoD infrastructures and high traffic areas following the aerosol release of a biological agent.</p>		3777	0	0
Total		3777	0	0

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BUDGET ACTIVITY RDT&E DEFENSE-WIDE/ BA3 - Advanced Technology Development (ATD)	PE NUMBER AND TITLE 0603384BP CHEMICAL/BIOLOGICAL DEFENSE (ATD)	PROJECT TT3
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	<u>FY 2007</u>	<u>FY 2008</u>	<u>FY 2009</u>
Technology Readiness Assessment	2615	2416	2705

Accomplishments/Planned Program	FY2007	FY2008	FY2009
FY 07 - Regional Biodefense Mobile Rapid Response Prototype (MRRP) - Initiated development of a mobile, forward deployable, medical capacity that will respond to bio-terrorist incidents and other mass casualty incidents resulting from WMD, natural and technological disasters.	1981	0	0
FY 07 - Continued the development of a tailored Manufacturing Readiness Assessment (MRA) process appropriate for transitioning technologies. FY 08 - Complete MRA. Conduct Technology Readiness Evaluation in support of the Interagency Biological Remediation Demonstration (I-BRD). FY 09 - Conduct Technology Readiness Evaluations in support of remediation and restoration technology demonstrations to identify technologies in support of IBRD, Installation Protection and Civil Support mission areas.	634	2416	2705
Total	2615	2416	2705

	<u>FY 2007</u>	<u>FY 2008</u>	<u>FY 2009</u>
SBIR/STTR	0	91	0

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Accomplishments/Planned Program	FY2007	FY2008	FY2009
SBIR - FY 08 - Small Business Innovative Research.	0	91	0
Total	0	91	0

C. <u>Other Program Funding Summary:</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 Compl</u>	<u>Total Cost</u>
TT4 TECHBASE TECHNOLOGY TRANSITION (ACD&P)	22983	15135	17327	19101	19224	19405	19815	Cont	Cont