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**Department of Defense
Fiscal Year (FY) 2024 Budget Estimates**

March 2023



Chemical and Biological Defense Program

Defense-Wide Justification Book Volume 4 of 5

Research, Development, Test & Evaluation, Defense-Wide

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Chemical and Biological Defense Program • Budget Estimates FY 2024 • RDT&E Program

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Chemical and Biological Defense Program Fiscal Year 2024 Budget Overview

The Chemical and Biological Defense Program (CBDP) is vital to the Department of Defense's ability to counter current and future chemical and biological threats. By providing the Joint Force with the capabilities it needs to fight and win in any chemical- and/or biological-contested environment, the CBDP enables a resilient Joint Force able to defend the homeland, deter aggression and strategic attacks against the U.S., Allies, and partners, and prepared to prevail in conflict when necessary. The need for modernized chemical and biological defenses is underscored by many factors. We continue to witness the gradual erosion of international norms against the use of weapons of mass destruction, especially chemical weapons. The COVID-19 pandemic highlighted the critical need for responsive biological defense capabilities to address emerging and advanced biological threats, whether naturally occurring, accidental, or deliberate in nature. Additionally, the sophistication with which chemical and biological weapons can be designed and engineered increases with rapid advances in science and technology, creating new potential risks for the Joint Force. Finally, increased competition with major powers, including the People's Republic of China as the pacing challenge and the Russian Federation as an acute threat, challenges the chemical and biological (CB) defense paradigm. In this new era, it is imperative that the Joint Force has modernized, resilient, and integrated chemical and biological defense capabilities.

The U.S. government clearly recognizes the need to address these CB defense challenges, as evidenced by the 2022 *National Security Strategy (NSS)*, 2022 *National Defense Strategy (NDS)*, 2022 *National Biodefense Strategy and Implementation Plan (NBS)*, 2022-2026 *DoD Strategic Management Plan (SMP)*, and the Secretary of Defense's 2021 *Biodefense Vision Memo*. Congressional legislation and joint statements with allies and partners similarly recognize this need.

We are in a decisive decade for chemical and biological defense. To stay ahead of chemical and biological threats, the CBDP is pivoting in its approach to defense capability development, moving to a threat- and risk-informed portfolio approach to modernization. This budget request is essential to execute the program pivot. The fiscal year 2024 (FY24) request of \$1,790.3 Million (M) is \$213.8M more than the FY23 enacted, which itself was an increase from FY22. We will not use these funds to do more of what we've always done. Instead, this request aims to transform how the Department researches, develops, and acquires chemical and biological defense capabilities. The CBDP must change faster than the threat.

This change includes reforming our organization and business processes to better deliver capabilities to the warfighter. The CBDP is implementing a new governance framework that ensures alignment to White House and Departmental strategic objectives, strengthens the



warfighter demand signal, and provides better oversight of the CBDP Enterprise. This new framework enables us to pursue a portfolio-based approach to close capability gaps more quickly. The overriding priority is to shrink the time from concept origination to capability delivery. By focusing on innovative system solutions that can be fielded incrementally, we will buy down risk and mitigate single-approach vulnerabilities. These changes will not be easy, but a failure to modernize our chemical and especially biological defense capabilities presents unacceptable risks to the Joint Force and the nation we defend. The CBDP's mission remains unchanged; how we achieve this mission is evolving quickly.

Strategic Overview

The 2022 NSS and 2022 NDS acknowledge an increasingly complex global security environment. The NSS identifies two strategic challenges: the competition between major powers and transboundary issues. Both strategic challenges impact the CBDP. The NSS further identifies the danger of catastrophic biological risks, arguing a “narrow window of opportunity” exists to take “steps nationally and internationally to prepare for the next pandemic and strengthen our biodefense.” To address the competition with major powers, the Department has adopted Integrated Deterrence backed by combat-credible military forces. As part of this effort, the NDS calls for improving the Joint Force's ability to operate in the face of limited chemical and biological attacks to deny adversaries the benefits of possessing and using these weapons.

As mentioned above, these geopolitical and scientific factors are transforming the CB threat landscape. The *NDS* identifies the People's Republic of China (PRC) as the pacing challenge, and Russia as an acute threat. The same document lists North Korea and Iran as persistent challenges. All these actors are pursuing destabilizing weapons of mass destruction (WMD) activities, to include cyber and disinformation. For example, the Department of State's April 2022 Compliance Report is unable to certify that the PRC is in compliance with the Chemical Weapons Convention (CWC). The same report raises concerns about Beijing's compliance with Biological Weapons and Toxins Convention (BWC), pointing to the PRC's dual-use activities. Chinese publications have described biology as a new domain of warfare and PRC leaders aspire to make their country a world leader in genetic engineering, precision-medicine, and brain sciences, among other scientific disciplines. The State Department has also assessed the Russian Federation and Democratic People's Republic of Korea (DPRK) maintain offensive chemical and biological weapons program, and raised concerns about Iran's compliance with the BWC. In many cases, foreign actors see chemical and biological weapons as an asymmetric advantage and relish their potential deterrent threat. To deny them these advantages, the Department must ensure the Total Force is prepared to fight and win in CB contested environments. The CBDP's investments must reflect this objective. The program will focus on being able to manufacture at scale while reducing unit cost. At the same time, CB defense capabilities



must be easy to use and unencumber the warfighter. In every instance, the CBDP will seek to utilize existing Joint Force equipment such as wearables or command and control networks. The program will focus on far forward capabilities that have minimal logistical burdens.

Alongside the geopolitical changes, scientific and technological advancements are transforming the threat landscape. Diverse sciences and technologies—including computational and cognitive science, nanotechnology, physics, and others-- are being applied to the physical and life sciences. The National Intelligence Council has called this bioconvergence and it has enormous implications for the CBDP. Among other effects, bioconvergence has the potential to create exponentially more biological threats and transformative chemical processes, forcing the Department away from only developing countermeasures against a definite list of known threat agents. Instead, the Department must seek broad-spectrum treatments and the ability to rapidly produce countermeasures as new threats emerge.

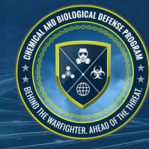
Bioconvergence could also challenge our ability to attribute the origins of an attack. For that reason, the *NDS* and the Secretary of Defense's *Biodefense Vision* direct the Department to be postured against the full spectrum of biological threats, whether naturally occurring, accidental, or deliberate. The *Biodefense Vision* also asked the Department to conduct the first-of-its kind Biodefense Posture Review (BPR). The BPR will establish the Department's approach to biodefense, to include clarifying biodefense priorities, roles, responsibilities, authorities, capabilities, and posture. As such, the CBDP participated in the BPR as a significant enabler and integrator of CB defense capabilities for the Department and our warfighters.

In many cases, the technologies underpinning bioconvergence have the potential to enhance CB defense. This budget request allows the CBDP to exploit these new technologies to achieve our mission of enabling the Joint Force to fight and win in CB-contested environments.

FY 2024 Portfolio Overview

The FY 2024 budget request of \$1,790.3M supports the Department's strategic priorities and guidance and will enable the continued development of capabilities to increase the resiliency of our warfighters. Enhanced resource levels in the CBDP portfolio also support the Federal preparedness and response efforts to ensure the Nation and the DOD are able to address emerging biological threats. The CBDP investments are aligned to the following portfolios (Figure 1):

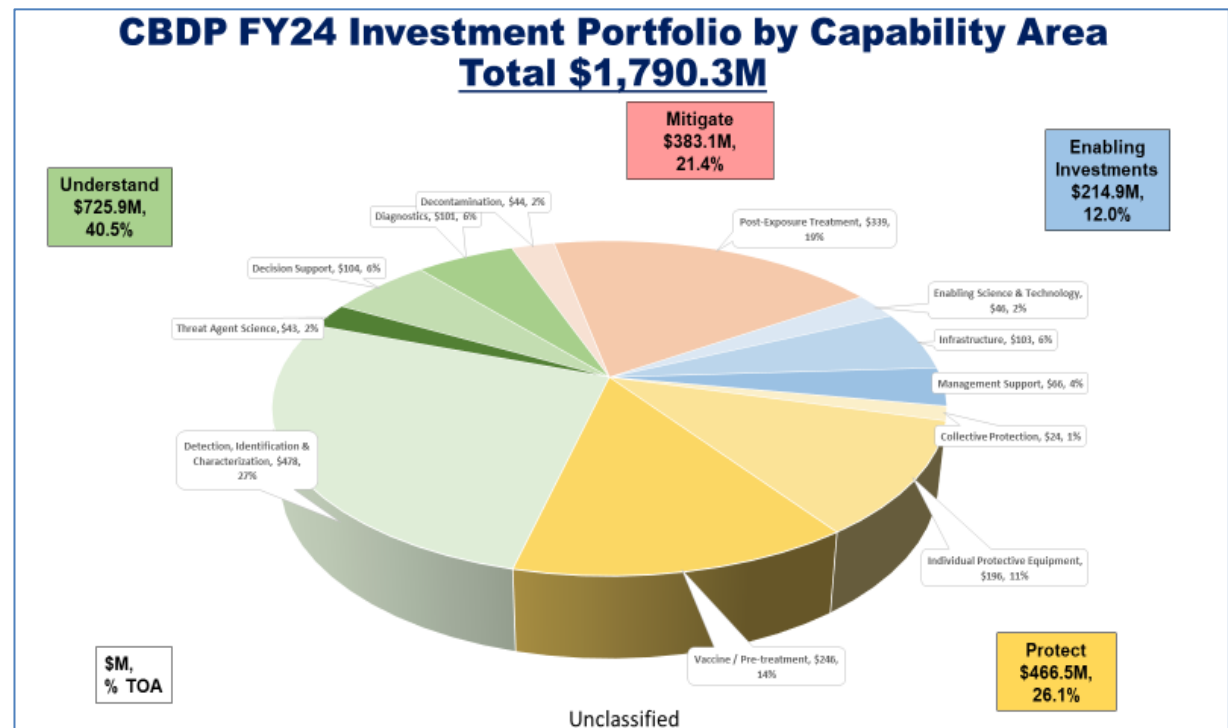
- Understand Portfolio (\$725.9M) - Reduces the risk from emerging threats resulting from advances in technology and the increased proliferation of WMD to prevent surprise to the Department and the nation. Efforts focus on accelerating characterization and early assessment of possible CB hazards by leveraging advances in technology and artificial intelligence. Capabilities development seeks to improve tactical and operational commanders' decisions through improved detection, diagnosis and identification capabilities to



support assigned missions. Developmental efforts focus on increasing detection accuracy, range and effectiveness, ensuring that data integrates seamlessly with other non-CB sensor systems and relevant information systems, and integration of sensors onto Service-fielded unmanned platforms.

Figure 1

- **Protect Portfolio (\$466.5M)**– Enhances mission performance and provides effective protection against current and emerging threats by rapidly developing and fielding modernized protection capabilities. Developmental efforts focus on advances in materials and systems engineering to enhance protective properties against a broader array of hazards, while reducing CWMD operational challenges and logistical burdens. Approaches focus on modular and customizable collective protection solutions that are effective against a broad range of challenges in varied environments. Investments seek to improve delivery of medical countermeasures (MCM) to the warfighter through a platform-based development approach to enable cost effective and agile delivery of prophylactic capabilities for known and emerging threats. Developmental efforts focus on advanced medical countermeasures that provide safe and effective medical defenses against biological agents (bacteria, toxins, and viruses), emerging infectious diseases, and chemical agents.



- **Mitigate Portfolio (\$383.1M)**– Preserves combat power by developing and fielding systems that mitigate exposure to CB hazards and restore combat readiness of critical personnel and platforms. Developmental efforts address personnel decontamination and materiel decontamination including sensitive equipment and aircraft. Novel decontamination approaches focus on broad decontaminant applicability to CB hazards, while minimizing harm to individuals, equipment, and platforms. Medical countermeasure efforts focus



on discovery and development of therapeutic products treating biological agents (bacteria, toxins, and viruses), emerging infectious diseases, and chemical agents.

- Enabling Investments (\$214.9M) – Provides fundamental knowledge, support to Research, Development, Testing, and Evaluation (RDT&E) infrastructure, technology demonstrations, and overarching RDT&E support functions as portfolio enablers key to responding to emerging threats. Dedicated funding in this portfolio supports National and Departmental incident response and preparedness to CB threats.

Modernized Chemical and Biological Defense

The CBDP is leaning forward to address the current and future threat landscape while building an agile and adaptable program to ensure execution of Department CB defense priorities. The Department's *SMP* identifies CB defense as a priority (Figure 2) within Strategic Objective 1.4 “Modernize and sustain the nuclear deterrent and protect against chemical and biological threats.” Understanding and anticipating threats is central to the CBDP's contribution to implement the *NDS*, *SMP*, the Secretary's *Biodefense Vision*, and to address the threats posed by our adversaries.

Strengthening the focus on countering CB threats, the FY2024 budget request includes increased resources to modernize biodefense approaches. At this pivotal time, the Department can no longer rely on a static list of historical bio-weapons agents; instead, the Department must aggressively assess, predict,

Figure 2

Strategic Objective 1.4: Modernize and sustain the nuclear deterrent and protect against chemical and biological threats

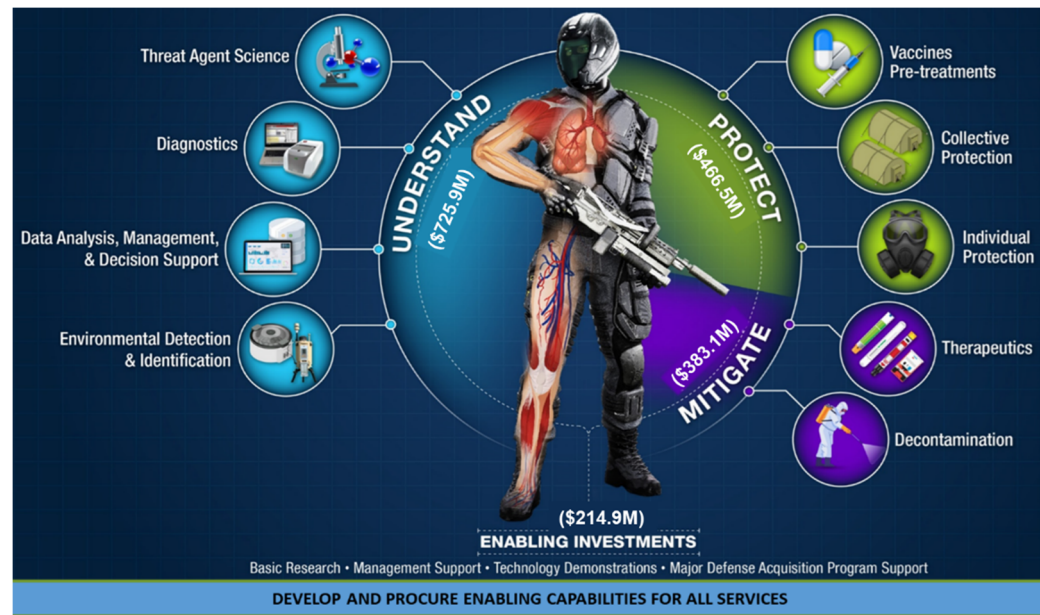
Strategic Objective Lead: Office of the Under Secretary of Defense for Acquisition & Sustainment (OUSD(A&S))

To ensure that the U.S. nuclear deterrent remains safe, secure, reliable, and effective, OUSD(A&S) will continue guiding and directing the highly complex and interdependent set of nuclear modernization and sustainment programs. As growing chemical and biological threats emerge and converge, we will similarly reform approaches to surveillance, detection, preparedness, and response, as well as advance development of revolutionary defense capabilities.



prepare for, respond to, and recover from the full spectrum of biological threats whether naturally occurring, accidental, or deliberate. The FY2024 budget request will allow the Department to make vital investments in novel and advanced biodefense capabilities.

The CBDP's biodefense modernization efforts aligns to clear operational capability end states. These strategic investments will focus on technologies that enable a more agile and responsive Joint Force, while addressing the dynamic and evolving biological threat landscape.



Further, these investments will enable the Department to change its approach to biological defense by modernizing the current operating paradigms including novel sciences and technologies that drive the United States' dynamic private industry. These additional resources will allow the Department to prioritize and support Joint All-Domain Operations and integrate the Department's biodefense capabilities with interagency investments. Ultimately, this approach will posture the Department to quickly detect and identify emerging biological threats, reduce risks, and prepare for, respond to, and recover from any type of biological threat-based event.

The enhanced investment levels are focused on advancing five key overarching goals aligned to the NBS and 2021 American Pandemic Preparedness Plan:

(1) Enhancing Rapid Response Vaccine Platforms Research and Manufacturing

- Establish key partnerships and exploit successful vaccine platforms, prototypes, and manufacturing capabilities
- Enhance the discovery or development of rapid response vaccine platforms research and manufacturing

(2) Expediting Surveillance and Pathogen Characterization (including diagnostics and detection)

- Enhance the flow of surveillance data and samples through a network of laboratories
- Expands deployable analytical capabilities, wearable technologies and leverages data analysis and modeling with machine learning/artificial intelligence



(3) Expanding Protection & Hazard Mitigation Capabilities

- *Accelerates prototyping and delivery of low-burden biothreat respiratory protection, collective protection, isolation systems, and improved disinfection*

(4) Evolving Therapeutics Research and Development

- *Focused on delivering or making available Food and Drug Administration (FDA) approved MCM products or tests to the warfighter that can either be immediately deployed in far-forward settings or included with the warfighter prior to deployment*

(5) Enhancing Biodefense Workforce and Biosafety

- *Adds critical technical expertise enhancing the CBDP biodefense and biosecurity activities and supply chain resiliency*

FY 2024 Budget Request Highlights

This budget shifts to an integrated portfolio approach that will reduce risk in research, development, and acquisition and more quickly deliver capabilities into the warfighter's hands. FY 2024 investments continue to invest in Service and Combatant Commander priorities, to include focused efforts providing rapid capability for the Special Operations Forces.

RDT&E

The FY 2024 RDT&E budget request of \$1,398.6 million supports key efforts including:

- \$355.5 million supporting enhanced biodefense and pandemic preparedness efforts. Efforts are focused on accelerating characterization and situational awareness of emerging biothreats, optimizing MCM manufacturing, and accelerating delivery of improved protection from and mitigation of biothreats, including rapid repurposing of available therapeutics and development of new vaccines.
- \$560.6 million to implement the new approach to research, development, and acquisition of MCMs, such as vaccines and therapeutics, addressing high-priority biological and chemical hazards.
- \$333.9 million supporting RDT&E efforts advancing environmental detection and medical diagnostic capabilities providing enhanced situational awareness of traditional and non-traditional chemical hazards, as well as traditional and emerging biological hazards.
- \$101.9 million supporting integrated early warning, warning & reporting, decision support, and modeling and simulation capabilities.



- \$112.6 million supporting RDT&E for personnel protection, respiratory and ocular protection, collective protection, and hazard mitigation capabilities against traditional and non-traditional CB agents.
- \$79.0 million supporting basic research and threat agent sciences, advancing fundamental knowledge and experimental research in the life and physical sciences.
- \$54.5 million supporting improved domestic incident preparedness and response to include dedicated efforts improving capabilities to address potential future pandemic and biological incidents. Additionally, these resources provide funding supporting the DoD Medical Countermeasures Advanced Development and Manufacturing capability.
- \$41.1 million supporting concepts development, technology demonstrations, enhanced capability demonstrations, and Special Operations Forces Rapid Capability Development and Deployment to enhance military operational capabilities with technologies and equipment. Resources a dedicated innovation fund to rapidly address emerging threats.

Procurement

The FY 2024 Procurement budget request of \$391.7 million supports key efforts including:

- \$85.9 million to procure improved air crew and ground forces protective ensembles to increase protection against advanced chemical and biological threats and decrease physiological burden.
- \$84.5 million to procure systems providing improved diagnostic, detection and identification capabilities with decreased operational costs and increased reliability for detection and diagnosis of biological and agents. Includes efforts providing portable chemical detection capabilities and improved multi-phase sampling and detection.
- \$60.5 million to procure CBRN Dismounted Reconnaissance Sets, Kits, and Outfits which allows warfighters to perform CBRN dismounted reconnaissance, surveillance, and site assessment of WMD suspect areas not accessible by traditional CBRN reconnaissance-mounted platforms.
- \$49.5 million to procure near-term urgent CBD requirements providing Special Operations Forces (SOF) critical life-saving protective capabilities and systems to safely operate in a CB-contaminated environment.
- \$24.1 million to procure the Advanced Anticonvulsant System providing a midazolam autoinjector for treatment against nerve induced seizures supporting operational readiness.



Summary

The last several years have demonstrated the increased probability and expansion of CB threats and technologies as the greatest challenges facing the United States of America, so the Department must prioritize improving our ability to counter these new and emerging threats. Currently, the erosion of international norms regarding the use of CB weapons, acceleration and advances in science and technology, and the re-emergence of strategic competition all worsen the current CB threat environment. The CBDP \$1,790.3M request focuses on key efforts across the Understand, Protect, Mitigate and Enable portfolios to provide new CB defense capabilities. Amid this new technological revolution, the United States must continue modernizing our defensive capabilities and reinvest in the Department's scientific and technological edge.



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Department of Defense
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 Exhibit R-1 FY 2024 President's Budget
 Total Obligational Authority
 (Dollars in Thousands)

Mar 2023

<u>Appropriation</u>	<u>FY 2022 Actuals</u>	<u>FY 2023 Less Supplementals Enactment</u>	<u>FY 2023 Supplementals Enactment*</u>	<u>FY 2023 Total Enactment</u>	<u>FY 2024 Request</u>
Research, Development, Test and Evaluation, Defense-Wide	1,050,175	1,257,964		1,257,964	1,398,625
Total Research, Development, Test, & Evaluation	1,050,175	1,257,964		1,257,964	1,398,625

*Includes enacted funding in the Ukraine Supplemental Appropriation Act, 2023 (Division B of Public Law 117-180) and Additional Ukraine Supplemental Appropriation Act, 2023 (Division M of Public Law 117-328).

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	FY 2022 Actuals	FY 2023 Less Supplementals Enactment	FY 2023 Supplementals Enactment*	FY 2023 Total Enactment	FY 2024 Request
<u>Summary Recap of Budget Activities</u>					
Basic Research	35,327	39,734		39,734	36,235
Applied Research	205,018	244,364		244,364	240,610
Advanced Technology Development	191,695	226,225		226,225	267,073
Advanced Component Development & Prototypes	133,902	252,010		252,010	316,853
System Development & Demonstration	291,122	301,611		301,611	382,977
Management Support	137,752	128,432		128,432	74,382
Operational Systems Development	55,359	65,588		65,588	80,495
Total Research, Development, Test, & Evaluation	1,050,175	1,257,964		1,257,964	1,398,625
<u>Summary Recap of FYDP Programs</u>					
Research and Development	1,050,175	1,257,964		1,257,964	1,398,625
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Appropriation: 0400D Research, Development, Test and Evaluation, Defense-Wide

Line No	Program Element Number	Item	Act	Se c	FY 2022 Actuals	FY 2023 Less Supplementals Enactment	FY 2023 Supplementals Enactment*	FY 2023 Total Enactment
8	0601384BP	Chemical and Biological Defense Program	01	U	35,327	39,734		39,734
	Basic Research				35,327	39,734		39,734
17	0602384BP	Chemical and Biological Defense Program	02	U	205,018	244,364		244,364
	Applied Research				205,018	244,364		244,364
49	0603384BP	Chemical and Biological Defense Program - Advanced Development	03	U	191,695	226,225		226,225
	Advanced Technology Development				191,695	226,225		226,225
79	0603884BP	Chemical and Biological Defense Program - Dem/Val	04	U	133,902	252,010		252,010
	Advanced Component Development & Prototypes				133,902	252,010		252,010
132	0604384BP	Chemical and Biological Defense Program - EMD	05	U	291,122	301,611		301,611
	System Development & Demonstration				291,122	301,611		301,611
163	0605384BP	Chemical and Biological Defense Program	06	U	116,573	126,432		126,432
164	0605502BP	Small Business Innovative Research - Chemical Biological Def	06	U	21,179	2,000		2,000
	Management Support				137,752	128,432		128,432
208	0607384BP	Chemical and Biological Defense (Operational Systems Development)	07	U	55,359	65,588		65,588
	Operational Systems Development				55,359	65,588		65,588
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132	0604384BP	Chemical and Biological Defense Program - EMD	05	U	382,977
		System Development & Demonstration			382,977
163	0605384BP	Chemical and Biological Defense Program	06	U	74,382
164	0605502BP	Small Business Innovative Research - Chemical Biological Def	06	U	
		Management Support			74,382
208	0607384BP	Chemical and Biological Defense (Operational Systems Development)	07	U	80,495
		Operational Systems Development			80,495
Total Chemical and Biological Defense Program					1,398,625

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Chemical and Biological Defense Program • Budget Estimates FY 2024 • RDT&E Program

Program Element Table of Contents (by Budget Activity then Line Item Number)

Appropriation 0400: Research, Development, Test & Evaluation, Defense-Wide

Line #	Budget Activity	Program Element Number	Program Element Title	Page
8	01	0601384BP	Chemical and Biological Defense Program.....	Volume 4 - 1

Appropriation 0400: Research, Development, Test & Evaluation, Defense-Wide

Line #	Budget Activity	Program Element Number	Program Element Title	Page
17	02	0602384BP	Chemical and Biological Defense Program.....	Volume 4 - 9

Appropriation 0400: Research, Development, Test & Evaluation, Defense-Wide

Line #	Budget Activity	Program Element Number	Program Element Title	Page
49	03	0603384BP	Chemical and Biological Defense Program - Advanced Development.....	Volume 4 - 63

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Chemical and Biological Defense Program • Budget Estimates FY 2024 • RDT&E Program

Appropriation 0400: Research, Development, Test & Evaluation, Defense-Wide

Line #	Budget Activity	Program Element Number	Program Element Title	Page
79	04	0603884BP	Chemical and Biological Defense Program - Dem/Val.....	Volume 4 - 133

Appropriation 0400: Research, Development, Test & Evaluation, Defense-Wide

Line #	Budget Activity	Program Element Number	Program Element Title	Page
132	05	0604384BP	Chemical and Biological Defense Program - EMD.....	Volume 4 - 247

Appropriation 0400: Research, Development, Test & Evaluation, Defense-Wide

Line #	Budget Activity	Program Element Number	Program Element Title	Page
163	06	0605384BP	Chemical and Biological Defense Program.....	Volume 4 - 405
164	06	0605502BP	Small Business Innovative Research - Chemical Biological Def.....	Volume 4 - 427

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Chemical and Biological Defense Program • Budget Estimates FY 2024 • RDT&E Program

Appropriation 0400: Research, Development, Test & Evaluation, Defense-Wide

Line #	Budget Activity	Program Element Number	Program Element Title	Page
208	07	0607384BP	Chemical and Biological Defense (Operational Systems Development).....	Volume 4 - 431

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Chemical and Biological Defense Program • Budget Estimates FY 2024 • RDT&E Program

Program Element Table of Contents (Alphabetically by Program Element Title)

Program Element Title	Program Element Number	Line #	BA	Page
Chemical and Biological Defense (Operational Systems Development)	0607384BP	208	07.....	Volume 4 - 431
Chemical and Biological Defense Program	0601384BP	8	01.....	Volume 4 - 1
Chemical and Biological Defense Program	0602384BP	17	02.....	Volume 4 - 9
Chemical and Biological Defense Program	0605384BP	163	06.....	Volume 4 - 405
Chemical and Biological Defense Program - Advanced Development	0603384BP	49	03.....	Volume 4 - 63
Chemical and Biological Defense Program - Dem/Val	0603884BP	79	04.....	Volume 4 - 133
Chemical and Biological Defense Program - EMD	0604384BP	132	05.....	Volume 4 - 247
Small Business Innovative Research - Chemical Biological Def	0605502BP	164	06.....	Volume 4 - 427

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Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Chemical and Biological Defense Program **Date:** March 2023

Appropriation/Budget Activity 0400: <i>Research, Development, Test & Evaluation, Defense-Wide</i> / BA 1: <i>Basic Research</i>	R-1 Program Element (Number/Name) PE 0601384BP / <i>Chemical and Biological Defense Program</i>
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COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
Total Program Element	0.000	35.327	39.734	36.235	0.000	36.235	37.812	43.264	49.270	50.188	Continuing	Continuing
LF1: <i>Life Sciences (Basic Research)</i>	-	19.114	19.199	20.335	0.000	20.335	21.125	26.206	29.030	29.575	Continuing	Continuing
PS1: <i>Physical Sciences (Basic Research)</i>	-	16.213	20.535	15.900	0.000	15.900	16.687	17.058	20.240	20.613	Continuing	Continuing

A. Mission Description and Budget Item Justification

This program element (PE) resources basic research efforts directed at promoting theoretical and experimental research in Life and Physical Sciences. These efforts are part of an integrated portfolio addressing emerging chemical and biological (CB) threats, and are a key enabler supporting the Understand, Protect, and Mitigate portfolios. Basic research focuses on pursuing fundamental science to advance a greater understanding of threats, improve situational awareness of emerging threats, and support transformative research in emerging research areas that can potentially foster paradigm shifts in the CB defense research arena to a rapid response capability.

Individual projects include:

- Life Sciences (LF1): fundamental efforts to understand living systems' response to biological or chemical agents to support detection, diagnostics, protection, and medical treatment (e.g., microbiology, biochemistry, pathogenic mechanisms, cell and molecular biology, immunology, nanoscale science, and information science).
- Physical Sciences (PS1): fundamental scientific phenomena to support the investigation of physical and chemical properties and interactions for enhanced functionalities important to detection, diagnostics, protection, and decontamination (e.g., chemistry, physics, materials science, nanotechnologies, nanoscale science, and environmental science).

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Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Chemical and Biological Defense Program **Date:** March 2023

Appropriation/Budget Activity	R-1 Program Element (Number/Name)
0400: <i>Research, Development, Test & Evaluation, Defense-Wide</i> / BA 1: <i>Basic Research</i>	PE 0601384BP / <i>Chemical and Biological Defense Program</i>

B. Program Change Summary (\$ in Millions)	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Previous President's Budget	37.208	34.734	35.341	-	35.341
Current President's Budget	35.327	39.734	36.235	-	36.235
Total Adjustments	-1.881	5.000	0.894	-	0.894
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	5.000			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-1.022	-			
• SBIR/STTR Transfer	-0.859	-			
• Other Adjustments	-	-	0.894	-	0.894

Congressional Add Details (\$ in Millions, and Includes General Reductions)

Project: PS1: *Physical Sciences (Basic Research)*

Congressional Add: *Physical Sciences*

	FY 2022	FY 2023
	2.500	5.000
Congressional Add Subtotals for Project: PS1	2.500	5.000
Congressional Add Totals for all Projects	2.500	5.000

Change Summary Explanation

Funding: FY 2022 (+\$2.500 Million): Congressional Add for chemically resistant, high-performance military cordage, rope and webbing is included in the Previous President's Budget total.

FY 2022 (-\$1.022 Million): Below threshold reprogramming to support priority protection and hazard mitigation efforts within Advanced Technology Development.

FY 2022 (-\$0.859 Million): Transfer of funding to support Small Business Innovative Research/Small Business Technology Transfer efforts.

FY 2023 (+\$5.000 Million): Congressional Add for waterless solutions for decontamination.

FY 2024 (+\$0.894 Million): Basic Research enhancements for strategic competition (+\$0.722 Million) and Departmental inflation rate adjustments (+\$0.172 Million).

Schedule: N/A

Technical: N/A

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Chemical and Biological Defense Program										Date: March 2023		
Appropriation/Budget Activity 0400 / 1					R-1 Program Element (Number/Name) PE 0601384BP / <i>Chemical and Biological Defense Program</i>				Project (Number/Name) LF1 / <i>Life Sciences (Basic Research)</i>			
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
LF1: <i>Life Sciences (Basic Research)</i>	-	19.114	19.199	20.335	0.000	20.335	21.125	26.206	29.030	29.575	Continuing	Continuing

A. Mission Description and Budget Item Justification

This Project (LF1) focuses on fundamental efforts to understand living systems' responses to biological or chemical agents to support detection, protection, diagnostics, and medical treatment. Research focuses on studying factors that influence the behavior of chemicals, toxins, and pathogens in relation to the host or target. Understanding host/agent interactions can drive the exploration of novel approaches to detect, diagnose or protect against threats. Research also focuses on medical countermeasures for improved efficacy against a wide array of current and future threat agents. This project is a key enabler supporting the Understand, Protect, and Mitigate portfolios.

Individual efforts in this Project include:

- Research to understand threats focused on illuminating pathogen/host interactions, innate and targeted immune responses, and drug/pathogen interactions that enable the development of new medical countermeasures and diagnostic platforms.
- Research in advancing countermeasures to understand underpinnings necessary to advance translational animal models for human disease, to explore artificial intelligence/machine learning (AI/ML) and novel structural biology approaches for enhancing rapid medical defense capabilities, to seek platform technologies with broad flexibility for drug development, and to improve protective factors for increasing therapeutic efficacy.

B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2022	FY 2023	FY 2024
Title: 1) Life Sciences	19.114	19.199	20.335
Description: Focuses on fundamental efforts to understand living systems' responses to biological agents, providing knowledge and capabilities that support medical countermeasure development for prophylaxis and therapeutic interventions.			
FY 2023 Plans:			
- Organoid Technology - Investigate cellular toxicity and metabolic profiles in organoids and evaluate relevance to animal model data. Determine inflammatory signaling in mouse models that are relevant to human cells.			
- Pathogenesis - Assess peptide protection against multiple subtype viral insult in mouse model. Assess influence of gene expression following viral infection.			
- Structural Biology - Investigate efficacy of inhibitor molecules in mouse models. Evaluate anti-alphavirus peptide for efficacy of reduced viral load in animal models. Design synthesis loop for production and testing of small molecules and validate machine-learning predictions.			

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Chemical and Biological Defense Program		Date: March 2023
Appropriation/Budget Activity 0400 / 1	R-1 Program Element (Number/Name) PE 0601384BP / <i>Chemical and Biological Defense Program</i>	Project (Number/Name) LF1 / <i>Life Sciences (Basic Research)</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2022	FY 2023	FY 2024
<p>- Artificial Intelligence (AI) for Early Drug Discovery - Develop training datasets for drug combinations and strategy for molecular selection. Evaluate model response to changing conditions and extend forecasting to additional diseases. Use AI model to generate therapeutic Monoclonal antibodies against bacterial targets and screen for efficacy.</p> <p>- Biomarkers - Begin testing machine-learning model to predict cellular binding site targets. Demonstrate screening framework for binders to expanded data set of pathogens.</p> <p>- Inflammation Mapping - Validate gene protection against chemical toxicity and assess neuron regeneration. Continue to integrate machine learning for predicting nerve reactivation and begin selecting molecules for validation.</p> <p>FY 2024 Plans:</p> <p>- Organoid Technology - Continue to investigate cellular toxicity and metabolic profiles in organoids and evaluate relevance to animal model data. Determine primary metabolite production in mouse cells.</p> <p>- Pathogenesis - Continue to assess peptide protection against multiple subtype viral insult in mouse model. Evaluate the impact of transcriptional changes on neuronal cell death in vitro.</p> <p>- Structural biology - Continue investigating efficacy of inhibitor molecules in mouse models. Characterize resistance to anti-alphavirus peptide to describe mechanism of action. Generate experimental data for testing of small molecules and validate machine-learning predictions.</p> <p>- Artificial Intelligence (AI) for Early Drug Discovery - Develop active learning strategy to guide selection and molecular screening. Continue to evaluate model response to changing conditions and extend forecasting to additional diseases. Use AI model to combine small molecule and therapeutic Monoclonal antibodies against bacterial targets and screen for efficacy.</p> <p>- Biomarkers - Begin iterative improvement of machine-learning model to predict cellular binding site targets. Integrate machine-learning architecture and sampling for iterative experimental design.</p> <p>- Inflammation Mapping - Begin testing of novel medical countermeasures in an in vitro nerve model. Begin validation of select molecules and demonstrate molecular design against in vitro data.</p> <p>FY 2023 to FY 2024 Increase/Decrease Statement: Minor change due to routine program adjustments.</p>			
Accomplishments/Planned Programs Subtotals	19.114	19.199	20.335

C. Other Program Funding Summary (\$ in Millions)											
<u>Line Item</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u> <u>Base</u>	<u>FY 2024</u> <u>OCO</u>	<u>FY 2024</u> <u>Total</u>	<u>FY 2025</u>	<u>FY 2026</u>	<u>FY 2027</u>	<u>FY 2028</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
• CB2: <i>Chemical Biological Defense (Applied Research)</i>	97.410	-	-	-	-	-	-	-	-	0.000	97.410
• MT2: <i>Mitigate (Applied Research)</i>	-	73.321	66.371	-	66.371	63.832	51.426	59.920	64.824	Continuing	Continuing

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Chemical and Biological Defense Program	Date: March 2023
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Appropriation/Budget Activity 0400 / 1	R-1 Program Element (Number/Name) PE 0601384BP / <i>Chemical and Biological Defense Program</i>	Project (Number/Name) LF1 / <i>Life Sciences (Basic Research)</i>
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C. Other Program Funding Summary (\$ in Millions)

<u>Line Item</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u> <u>Base</u>	<u>FY 2024</u> <u>OCO</u>	<u>FY 2024</u> <u>Total</u>	<u>FY 2025</u>	<u>FY 2026</u>	<u>FY 2027</u>	<u>FY 2028</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
• PT2: <i>Protect (Applied Research)</i>	-	58.091	55.057	-	55.057	56.153	57.817	61.452	61.452	Continuing	Continuing
• TM2: <i>Techbase Medical Defense (Applied Research)</i>	107.608	-	-	-	-	-	-	-	-	0.000	107.608
• UN2: <i>Understand (Applied Research)</i>	-	112.952	119.182	-	119.182	111.773	107.842	107.193	107.193	Continuing	Continuing

Remarks

D. Acquisition Strategy

N/A

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Chemical and Biological Defense Program **Date:** March 2023

Appropriation/Budget Activity 0400 / 1	R-1 Program Element (Number/Name) PE 0601384BP / <i>Chemical and Biological Defense Program</i>	Project (Number/Name) PS1 / <i>Physical Sciences (Basic Research)</i>
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COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To	Total
											Complete	Cost
PS1: <i>Physical Sciences (Basic Research)</i>	-	16.213	20.535	15.900	0.000	15.900	16.687	17.058	20.240	20.613	Continuing	Continuing

A. Mission Description and Budget Item Justification

This Project (PS1) advances fundamental scientific knowledge in physical science areas that include chemistry, physics, materials science, environmental science, and nanotechnology that could potentially lead to transformational CB defensive capabilities enhancing Warfighter performance and safety. This project is a key enabler supporting the Understand, Protect, and Mitigate portfolios.

Individual efforts in this Project include:

- Innovative materials focuses on understanding the physics, physical properties, fabrication pathways, and characterization methods related to material classes that would enable novel, advanced capabilities for decontamination, protection and detection of chemical and biological (CB) threats.
- Novel sensing research to improve the understanding of elementary physics or fundamental materials properties to construct novel platforms and approaches for detection, diagnostics, hazard mitigation and protection.
- Modeling sciences research to explore the potential of Artificial Intelligence/Machine Learning (AI/ML) computational approaches for hazard mitigation, stand-off physio-monitoring, rational and rapid design of medical countermeasures, and novel materials with enhanced efficacy.

B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2022	FY 2023	FY 2024
Title: 1) Physical Sciences	13.713	15.535	15.900
Description: Focuses on fundamental scientific phenomena including chemistry, physics, materials science, environmental science, and nanotechnology.			
FY 2023 Plans:			
- Multifunctional Materials - Design experiments to predict high-performing materials. Synthesize and characterize materials for stability in preparation for testing.			
- Design Rules for Materials - Evaluate surface interactions of the metal organic framework against simulant molecules. Expand model to incorporate kinetics and thermodynamic interactions of chemical decomposition based on simulant work.			
- Biomimetic - Complete design and validate macroscale biomimetic membrane. Demonstrate application of stabilized enzymes and optimization of kinetic and structural features.			
- Photocatalysis - Synthesize metal organic framework (MOF) and evaluate surface characteristics to determine strategy for tuning properties. Perform studies using simulants and model energetic effects.			

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Chemical and Biological Defense Program		Date: March 2023
Appropriation/Budget Activity 0400 / 1	R-1 Program Element (Number/Name) PE 0601384BP / <i>Chemical and Biological Defense Program</i>	Project (Number/Name) PS1 / <i>Physical Sciences (Basic Research)</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2022	FY 2023	FY 2024
- Novel Destruction - Continue developing a kinetic rates model for organic compounds and Chemical Warfare Agent (CWA) surrogates. Continue investigating new nano-catalyst synthesis method to reduce material costs and improve catalytic activity.			
FY 2024 Plans: -Multifunctional Materials - Begin development of peptoid-based ultrathin membranes with customized reactivation sites. Establish design, methodology and assembly protocols for fusion tag system and surface binding functionality at various densities. -Design Rules for Materials - Complete characterization and testing of bi-functional materials. Develop synthetic process for design of metal organic framework with high adsorption capacity and selectivity. -Biomimetic - Investigate scalability of protein designs and test membrane-protein against simulants. Begin synthesis of polymer coating to nylons and characterization of mechanical properties. -Photocatalysis - Characterize individual components of hybrid catalysts and their interactions with simulants, in light and dark. Continue studies of aerogels using simulants and model energetic effects. -Novel Destruction - Investigate binding specificity of enzymes for catalytic activity and improved sensitivity. Experiment with photochemical activity and determine oxidation capacity of materials.			
FY 2023 to FY 2024 Increase/Decrease Statement: Minor change due to routine program adjustments.			
Accomplishments/Planned Programs Subtotals	13.713	15.535	15.900

	FY 2022	FY 2023
Congressional Add: Physical Sciences	2.500	5.000
FY 2022 Accomplishments: Chemically resistant, high-performance military cordage, rope, and webbing.		
FY 2023 Plans: Waterless solutions for decontamination.		
Congressional Adds Subtotals	2.500	5.000

C. Other Program Funding Summary (\$ in Millions)	Line Item	FY 2022	FY 2023	FY 2024			FY 2025	FY 2026	FY 2027	FY 2028	Cost To	
				Base	OCO	Total					Complete	Total Cost
	• CB2: <i>Chemical Biological Defense (Applied Research)</i>	97.410	-	-	-	-	-	-	-	-	0.000	97.410
	• MT2: <i>Mitigate (Applied Research)</i>	-	73.321	66.371	-	66.371	63.832	51.426	59.920	64.824	Continuing	Continuing
	• PT2: <i>Protect (Applied Research)</i>	-	58.091	55.057	-	55.057	56.153	57.817	61.452	61.452	Continuing	Continuing

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Chemical and Biological Defense Program		Date: March 2023
Appropriation/Budget Activity 0400 / 1	R-1 Program Element (Number/Name) PE 0601384BP / <i>Chemical and Biological Defense Program</i>	Project (Number/Name) PS1 / <i>Physical Sciences (Basic Research)</i>

C. Other Program Funding Summary (\$ in Millions)

<u>Line Item</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u> <u>Base</u>	<u>FY 2024</u> <u>OCO</u>	<u>FY 2024</u> <u>Total</u>	<u>FY 2025</u>	<u>FY 2026</u>	<u>FY 2027</u>	<u>FY 2028</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
• TM2: <i>Techbase Medical Defense (Applied Research)</i>	107.608	-	-	-	-	-	-	-	-	0.000	107.608
• UN2: <i>Understand (Applied Research)</i>	-	112.952	119.182	-	119.182	111.773	107.842	107.193	107.193	Continuing	Continuing

Remarks

D. Acquisition Strategy

N/A

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Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Chemical and Biological Defense Program **Date:** March 2023

Appropriation/Budget Activity 0400: <i>Research, Development, Test & Evaluation, Defense-Wide I BA 2: Applied Research</i>	R-1 Program Element (Number/Name) PE 0602384BP / <i>Chemical and Biological Defense Program</i>
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COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
Total Program Element	0.000	205.018	244.364	240.610	0.000	240.610	231.758	217.085	228.565	233.469	Continuing	Continuing
UN2: <i>Understand (Applied Research)</i>	-	0.000	112.952	119.182	0.000	119.182	111.773	107.842	107.193	107.193	Continuing	Continuing
PT2: <i>Protect (Applied Research)</i>	-	0.000	58.091	55.057	0.000	55.057	56.153	57.817	61.452	61.452	Continuing	Continuing
MT2: <i>Mitigate (Applied Research)</i>	-	0.000	73.321	66.371	0.000	66.371	63.832	51.426	59.920	64.824	Continuing	Continuing
CB2: <i>Chemical Biological Defense (Applied Research)</i>	-	97.410	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	97.410
TM2: <i>Techbase Medical Defense (Applied Research)</i>	-	107.608	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	107.608

A. Mission Description and Budget Item Justification

This program element (PE) resources Applied Research across the Understand, Protect, and Mitigate portfolios. Chemical and Biological Defense Program (CBDP) investments provide an integrated, layered capability to enable combating weapons of mass destruction (CWMD) missions ranging from combat operations to Department of Defense (DoD) support to domestic incident prevention and response. The Projects in this PE support applied research in the areas of physical technologies, non-traditional agent (NTA) medical and physical defense technologies, and medical technologies. These investments are a key component to sustaining the core physical and intellectual chemical and biological (CB) defense infrastructure of the Department and support the delivery of capabilities, assessments of emerging threats, and the ability to surge unique capabilities in response to a CB event. FY24 funding accelerates characterization and situational awareness of emerging biothreats and accelerates delivery of improved protection from and mitigation of biothreats, including rapid repurposing of available therapeutics and development of new vaccines.

Individual Projects include:

- Understand (UN2): Development of next-generation chemical and biological hazard detectors, point-of-need diagnostic devices, next-generation diagnostics systems, decision support tools, algorithms, and software.
- Protect (PT2): Development of antidotes, disease surveillance medical technologies, vaccines, nerve agent pretreatments, and respiratory and ocular protection. Improvement of protection technologies and biological weapon/agent surveillance.
- Mitigate (MT2): Improvement of CB defense material, including contamination avoidance and decontamination. Development of drug treatments, therapeutics, patient decontamination technologies, and individual protection advancements.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Chemical and Biological Defense Program **Date:** March 2023

Appropriation/Budget Activity 0400: <i>Research, Development, Test & Evaluation, Defense-Wide I BA 2: Applied Research</i>	R-1 Program Element (Number/Name) PE 0602384BP / <i>Chemical and Biological Defense Program</i>
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- Chemical Biological Defense (CB2) and Techbase Medical Defense (TM2) are no longer active Projects due to budget restructuring.

CBDP Science and Technology (S&T) Applied Research Performers: U.S. Army Combat Capabilities Development Command Chemical Biological Center (DEVCOM CBC), United States Army Medical Research Institute of Infectious Diseases (USAMRIID), United States Army Medical Research Institute of Chemical Defense (USAMRICD), United States Army Natick Soldier Systems Center, Naval Research Lab (NRL), Air Force Research Lab (AFRL), and Department of Energy Laboratories such as Pacific Northwest National Laboratory (PNNL), among others. The intent is to maintain strategic partnerships with the DoD Service communities & the interagency for mission success across the enterprise through collaborative planning and programming maintaining budget assurance.

Efforts under this PE will transition to or will provide risk reduction for Advanced Technology Development (PE 0603384BP), Advanced Component Development and Prototypes (PE 0603884BP), and System Development and Demonstration (PE 0604384BP) activities.

B. Program Change Summary (\$ in Millions)	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Previous President's Budget	209.956	256.197	248.726	-	248.726
Current President's Budget	205.018	244.364	240.610	-	240.610
Total Adjustments	-4.938	-11.833	-8.116	-	-8.116
• Congressional General Reductions	-	-0.273			
• Congressional Directed Reductions	-	-11.560			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-1.500	-			
• SBIR/STTR Transfer	-3.438	-			
• Other Adjustments	-	-	-8.116	-	-8.116

Congressional Add Details (\$ in Millions, and Includes General Reductions)

Project: TM2: *Techbase Medical Defense (Applied Research)*

Congressional Add: *Biological Warfare Defense Therapeutics*

Congressional Add Subtotals for Project: TM2

Congressional Add Totals for all Projects

	FY 2022	FY 2023
	3.000	-
	3.000	-
	3.000	-

Change Summary Explanation

Funding: FY 2022 (+\$3.000 Million): Congressional Add for tularemia medical countermeasure is reflected in the Previous President's Budget total.

FY 2022 (-\$1.500 Million): Reprogrammed prior year execution balances to RDT&E Management Support, Budget Activity 6 in support of the Departments higher priorities.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Chemical and Biological Defense Program **Date:** March 2023

Appropriation/Budget Activity	R-1 Program Element (Number/Name)
0400: <i>Research, Development, Test & Evaluation, Defense-Wide I BA 2: Applied Research</i>	PE 0602384BP / <i>Chemical and Biological Defense Program</i>

FY 2022 (-\$3.438 Million): Transfer of funding to support Small Business Innovative Research/Small Business Technology Transfer efforts.

FY 2023 (-\$0.273 Million): Congressional General Reductions to support Federally Funded Research and Development Centers (FFRDCs).

FY 2023 (-\$11.560 Million): Congressional Directed Reductions.

FY 2024 (-\$8.116 Million): Departmental inflation rate adjustments (+\$1.167 Million) and a reduction in Applied Research due to technology progressing to Advanced Technology Development (-\$9.283 Million).

Schedule: N/A

Technical: N/A

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Chemical and Biological Defense Program										Date: March 2023		
Appropriation/Budget Activity 0400 / 2					R-1 Program Element (Number/Name) PE 0602384BP / <i>Chemical and Biological Defense Program</i>				Project (Number/Name) UN2 / <i>Understand (Applied Research)</i>			
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
UN2: <i>Understand (Applied Research)</i>	-	0.000	112.952	119.182	0.000	119.182	111.773	107.842	107.193	107.193	Continuing	Continuing

A. Mission Description and Budget Item Justification

The Understand Applied Research Project provides the Joint Force with the abilities to detect, identify, and characterize chemical and biological (CB) threat agents. This includes classification and/or identification of the threat and potentially the amount of chemical, biological, radiological, and nuclear (CBRN) hazards in all physical states. Efforts provide the ability to characterize the CBRN hazard to a commander and develop a clear understanding of the current and predicted CBRN situation; collect, query, and assimilate information from sensors, intelligence and medical communities, etc., in near real time to inform decisions; and provide actual and potential impacts of CBRN hazards. In FY 2023, the Chemical Biological Defense Program (CBDP) RDT&E Projects have been restructured to align with the CBDP portfolio construct. UN2 efforts in FY 2022 remain in Projects CB2 and TM2. This restructuring provides standardization and alignment across CBDP research, development and acquisition efforts.

Thrust Areas included in this Project are:

- (1) Chemical, Biological, Radiological, and Nuclear (CBRN) Battlespace Sensing, Alerting & Response
- (2) CBRN Decision Aids
- (3) CBRN Situational Awareness
- (4) Chemical Diagnostics
- (5) Diagnostic Building Blocks
- (6) Emerging Threats
- (7) Distributed CB Reconnaissance
- (8) Emerging and Enhanced Biothreat Sensing
- (9) Employment Characterization
- (10) Environmental Response
- (11) First Look (Chemical and Biological)
- (12) Host Response
- (13) Technical Surprise
- (14) Expeditionary Analytical Toolkit (ExAnT)
- (15) Unattended Perimeter Monitoring
- (16) Unconventional Detection Modalities

CBRN Battlespace Sensing, Alerting & Response: Development of algorithms that generate and disseminate warning to personnel in time to prevent exposure to or limit the impact of CBRN threats. This thrust area conducts data collection trials to support algorithm development; leverage Artificial Intelligence (AI) to identify key

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<p>indicators, combinations of indicators, and sensing modalities to reduce false alarms and predict the likelihood of exposure; explore remote and contactless monitoring and analysis for application in Warfighter chemical and biological threat exposure alerting.</p> <p>CBRN Decision Aids: Providing tools that assess risk from CBRN hazards and identify courses of action to limit impact. This thrust area permits connectivity, enabling the dynamic discovery, querying, and control of sensors through standard protocols; allow for dynamic discovery and integration between networked devices at the tactical edge to enable sharing of information and capabilities across connected components.</p> <p>CBRN Situational Awareness: Providing operationally relevant context to CB-specific phenomena data to ensure the Joint Force is able to characterize new CB hazards and mitigate their effects on mission success. This thrust area provides the analytic framework to determine optimal defense postures by extrapolating scientific data generated during the course of technology development and hazard assessment data into an assessment to help inform operational utility.</p> <p>Chemical Diagnostics: Discovers innovative and integrated capabilities that are able to diagnose threats across the chemical spectrum and enhance force protection by investing in diagnostics for exposure to traditional and nontraditional Chemical Warfare Agents (CWA), including pharmaceutical based agents. Efforts include coordinating with Threat Agent Science and the Intelligence Community and to understand the chemical threat space.</p> <p>Diagnostic Building Blocks: Develops foundational capabilities for the entire diagnostics portfolio; invests in innovative, cutting-edge technologies to improve the development pipeline for diagnostics; and exploits areas in artificial intelligence synthetic biology and machine learning to develop novel and rapid diagnostic tests for utilization. Efforts accelerate assay development timelines and optimize test parameters by leveraging novel concepts and tools that readily allow a pivot to assay development for emerging threats. Efforts include additional investments in enhanced biodefense and pandemic preparedness.</p> <p>Emerging Threats: Efforts to push beyond the boundaries of the traditional threat list in the field of diagnostics to better prepare for surprise. Investments in developing diagnostic systems that leverage novel approaches to characterize the pathogen or the host response enables the delivery of actionable information, such as administering the appropriate antibiotic, antiviral, or vaccine to a medic or primary care provider. Efforts include additional investments in enhanced biodefense and pandemic preparedness.</p> <p>Distributed CB Reconnaissance: Enhances early warning and situational awareness of CB threats while reducing potential Warfighter exposure using distributed CB reconnaissance tools to include low-cost point sensors and sensing/collection systems for unmanned platforms. Efforts include developing threat sensing and sampling payloads for manned and unmanned aerial and ground platforms to enhance early warning and situational awareness of CB threats.</p> <p>Enhanced and Emerging Biothreat Sensing: Establishes a capability to rapidly develop advanced, agile, pathogen-agnostic laboratory and field forward detection capabilities to detect emerging and enhanced biological threats across all force echelons (presumptive, field confirmatory, theater validation, and definitive identification). Further, multiple biological measurements will be used to modernize laboratory capabilities and leverage synthetic biology methods and tools to deliver enhanced biothreat sensing/detection capabilities to the Joint Force.</p>		

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Chemical and Biological Defense Program	Date: March 2023
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Employment Characterization: Conduct studies to help refine threat assessments and potential impacts of indoor or outdoor releases of threat agents on operations, strategy, and capabilities. Studies will include both laboratory, chamber-based dissemination characterization and full-scale outdoor trials. Results from studies will help determine risks posed by an agent employed in a similar fashion by an adversary.

Environmental Response: Evaluate CB threats that have been released into the environment (e.g., persistence, degradation, and decomposition) along with the effects environmental conditions (e.g., ozone, ultraviolet, humidity, etc.) have on those agents. Identify and characterize behavior of chemical and biological agents in the environment (to include soil, water, and plants) on clothing, on and in structures, and on equipment to support model development and decision-making tools.

First Look (Chemical and Biological): Provide the initial characterization of potential CB threats and provide a fundamental assessment of the potential risk(s) they pose. Evaluate agents and develop both methods and capabilities to quickly and accurately characterize chemical, biological, and toxin agent properties to inform capability development and modeling for CB defense community stakeholders.

Host Response: Characterize effects (acute vs. chronic) from exposure to toxic chemicals or infectious biological agents using operationally relevant exposure scenarios, exposure routes, and appropriate assessment methods and models. Improve understanding of the mechanisms of action, infectivity, morbidity, and mortality of agents and provide adverse health effects information and other relevant data. Data from host response studies will also be used to help develop predictive capabilities for identifying the human response to chemical and biological threat agents.

Technical Surprise: Mitigate technical surprise by providing technology over-watch and horizon scanning tools to assess advances in technologies and scientific knowledge, with a focus on breakthroughs that can/will overcome bottlenecks and enable the development of capabilities of concern. Improve threat awareness scanning capabilities allowing for continuous, real-time monitoring to identify emerging threats, maintain situational awareness of the threat environment, and assess technological convergence. Efforts include additional investments in enhanced biodefense and pandemic preparedness.

Expeditionary Analytical Toolkit (ExAnT): Provides general and specialized forces with the ability to modernize detection technologies for traditional threats while enhancing detection capabilities for non-traditional, emerging, and mixed chemical hazards.

Unattended Perimeter Monitoring: Invests in efforts supporting Integrated Early Warning and Integrated Layered Defense by establishing a layered defense capability through developing and implementing automated and integrated technologies enabling unattended monitoring for chemical and biological threats.

Unconventional Detection Modalities: Develops disruptive technologies pushing the boundaries of currently fielded sensors and detection technologies to develop novel sensors that operate in complex threat environments with high fidelity.

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2022	FY 2023	FY 2024
Title: 1) CBRN Battlespace Sensing, Alerting, and Response	-	8.000	7.250
Description: Improve the Department of Defense's capability to detect, identify, alert, and respond to deliberate releases and naturally occurring outbreaks of chemical and biological threat agents. Focus on large, real-time human data collects			

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B. Accomplishments/Planned Programs (\$ in Millions)		FY 2022	FY 2023	FY 2024
<p>of chemical and biological (CB) agent / agent proxy exposures. Studies will focus on examining the feasibility of specifically isolating indicators of respiratory infection, determining severity of infection, predicting return to mission readiness after exposure, and examining physiological effects on human tissue in multi-organ-chips after exposure to CB threat agents. Enable early implementation of countermeasures such as isolation, quarantine, and removal from an area, thus potentially reducing transmission, morbidity, and mortality rates. Mature algorithms and incorporate Machine Learning (ML) approaches for refining sensitivity and specificity.</p> <p>FY 2023 Plans:</p> <ul style="list-style-type: none"> - Continue wearable device-based non-invasive biomarker analysis and algorithm enhancement for pre-symptomatic indication of chemical or biological exposure. - Continue to develop predictive algorithms and analytic tools utilizing artificial intelligence (AI) and ML techniques to allow for rapid response to emerging threats and detection of genetically engineered pathogens. - Continue development of AI-based drug discovery algorithms for Emerging Threats. - Continue the advancement of standoff physiological monitoring capabilities. - Utilize a multi-organ chip system to characterize the effects of biological threat agents on several different cultured human tissues and conduct multi-omics analysis (e.g. proteomics, metabolomics) to identify potential biomarkers associated with physiological responses from exposure to high, mid, and low multiplicity of infection. <p>FY 2024 Plans:</p> <ul style="list-style-type: none"> - Continue wearable device-based non-invasive algorithm enhancements for pre-symptomatic indication of chemical or biological exposure. - Continue to develop predictive algorithms and analytic tools utilizing artificial intelligence (AI) and ML techniques to allow for rapid response to emerging threats and detection of genetically engineered pathogens. - Continue development of AI-based drug discovery algorithms for Emerging Threats. - Continue the advancement of standoff physiological monitoring capabilities to include efforts that increase the standoff distance at which physiological data can be captured. - Continue work with multi-organ chip system to characterize the effects of biological threat agents on several different cultured human tissues and conduct multi-omics analysis (e.g. proteomics, metabolomics) to identify potential biomarkers associated with physiological responses from exposure to high, mid, and low multiplicity of infection. <p>FY 2023 to FY 2024 Increase/Decrease Statement: Minor change due to routine program adjustments.</p>				
Title: 2) CBRN Decision Aids		-	4.667	3.250

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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2022	FY 2023	FY 2024
<p>Description: In order to unencumber the Warfighter at the tactical edge, efforts continue to develop and transition science & technology for CBRN Decision Aids on End User Devices (EUDs) in both connected and disconnected operations. Focus on utilizing automation, reducing the burden experienced by the warfighter, while providing accurate, actionable information. Develop a Contamination Avoidance Decision Aid to inform the warfighter on how to avoid, respond to and plan routes around CB hazards. Develop an Autonomous Asset Guidance capability to optimize their use and reduce the burden incurred by the warfighter in order to operate them. Fuse and utilize data from Autonomous Assets to improve and refine other CBRN Decision Aids.</p> <p>FY 2023 Plans:</p> <ul style="list-style-type: none"> - Continue development of warning and decision aids for tactical users leveraging the compute resources resident on EUDs. - Continue development of AR-based technologies to incorporate CB threat situational awareness in EUDs. <p>FY 2024 Plans:</p> <ul style="list-style-type: none"> - Continue development of warning and reporting decision aids for tactical users leveraging the compute resources resident on EUDs. - Continue development of Augmented Reality (AR) based technologies to incorporate CB threat situational awareness in EUDs. -Initiate the development of tools that support the interoperability, integration, and automation of decision aids to further reduce the need for manual user inputs. <p>FY 2023 to FY 2024 Increase/Decrease Statement: Decrease due to change in program/project technical parameters. Decrease due to efforts within this area maturing and transitioning to Budget Activity 3.</p>			
<p>Title: 3) CBRN Situational Awareness</p> <p>Description: Expand on the types of threats that can be modeled with hazard assessment capabilities to include fixed-wing and rotary-wing drones of interests and allow for airborne CB releases from single drones and swarms to be modeled. Leverage Virtual Reality (VR) and Augmented Reality (AR) technologies to develop CB focused training and mission rehearsal capabilities that will be integrated into systems widely used by the Joint Force. Develop virtual training environments to implement, visualize and account for hazard source terms and plumes generated by transport and dispersion (T&D) models. Explore AR applications for tactical use to maximize warfighter CB situational awareness on the battlefield. Modernize hazard modeling capabilities by adopting a modular framework and integrating across Service command and control systems to operationalize reachback support. Enhance hazard modeling by creating a seamless indoor-to-outdoor T&D modeling capability and improve urban T&D modeling to support operations in urban and mixed environments. Leverage new state-of-the-art computational fluid dynamics modeling techniques and their use of computing resources to increase both modeling speed and accuracy. Develop CB health effect modeling software and analytic tools to support force readiness and facilitate medical planning against chemical and biological agents. Develop epidemiological models to quantify and visualize mission operational impacts from exposure to, and spread of,</p>	-	11.812	15.880

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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2022	FY 2023	FY 2024
<p>infectious biological threat agents. Leverage threat agent science (TAS) data to enhance capabilities for modeling health effects and host pathogen interactions from exposures to traditional and non-traditional CB agents, providing the warfighter with more accurate casualty estimates accounting for human health effects.</p> <p>FY 2023 Plans:</p> <ul style="list-style-type: none"> - Complete development of models to provide operationally relevant outputs to support medical decision making. - Continue to develop Machine Learning (ML) algorithms for disease prediction and forecasting for mobile platforms. - Continue to enhance CB situational awareness capabilities for integration into Heads up Display (HUD) technologies. - Initiate efforts to expand focus on emerging threat hazard modeling, leveraging TAS data to ensure the Joint Force is able to characterize new CB hazards and mitigate their effects on mission success. - Explore new areas for targeted investment in synthetic environments to provide a CBRN-specific cognitive, collective, multi-echelon training and mission readiness capability. - Explore in-host modeling capabilities leveraging ML/Artificial Intelligence (AI) techniques to characterize predictive biomarkers of chemical and biological exposure prior to onset of symptoms. <p>FY 2024 Plans:</p> <ul style="list-style-type: none"> - Continue to develop Machine Learning (ML) algorithms for disease prediction and forecasting for mobile platforms. - Continue to enhance CB situational awareness capabilities for integration into Heads up Display (HUD) technologies. - Continue efforts to expand emerging threat hazard modeling, leveraging TAS data to ensure the Joint Force is able to characterize new CB hazards and mitigate their effects on mission success. - Continue the development of VR-based synthetic environments in order to provide a CBRN-specific cognitive, collective, multi-echelon training and mission readiness capability. - Continue the development of in-host modeling capabilities leveraging ML and Artificial Intelligence (AI) techniques to characterize predictive biomarkers of chemical and biological exposure prior to onset of symptoms. <p>FY 2023 to FY 2024 Increase/Decrease Statement: Increase due to change in program/project technical parameters.</p>			
<p>Title: 4) Chemical Diagnostics</p> <p>Description: Provide innovative and integrated capabilities to the Warfighter that are able to diagnose threats across the chemical spectrum. Enhance force protection by investing in diagnostics for exposure to traditional and nontraditional Chemical Warfare Agents (CWAs), including pharmaceutical based agents (PBAs). Leverage the development of a chemical diagnostic that monitors blood, indicating whether a Warfighter has been exposed to nerve agents within minutes.</p> <p>FY 2023 Plans:</p>	-	0.693	0.698

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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2022	FY 2023	FY 2024
<p>- Continue the development of integrated capabilities that address portable ultra-low detection of opioids to the Next Generation Diagnostic System Increment 2 Chemical Diagnostic (NGDS 2 CHEMDX) device that will allow for differentiating between classes of CWAs, resulting in more informed treatment decisions.</p> <p>FY 2024 Plans:</p> <p>- Continue the development of integrated capabilities that address portable ultra-low detection of opioids to the Next Generation Diagnostic System Increment 2 Chemical Diagnostic (NGDS 2 CHEMDX) device that will allow for differentiating between classes of CWAs, resulting in more informed treatment decisions.</p> <p>FY 2023 to FY 2024 Increase/Decrease Statement:</p> <p>Minor change due to routine program adjustments.</p>			
<p>Title: 5) Diagnostic Building Blocks</p> <p>Description: Develop novel, state of the art capabilities that lay the foundation for modernizing other areas within the diagnostics portfolio. This includes exploiting areas such as synthetic biology and chemistry to develop novel and rapid diagnostic tests for utilization in the event of an outbreak of an unknown threat. Invest in efforts that lead to accelerated assay development timelines and optimized test parameters through leveraging artificial intelligence (AI) and machine learning (ML) to allow us to quickly pivot and develop assays for emerging threats and speed up development to days instead of weeks.</p> <p>FY 2023 Plans:</p> <p>- Continue efforts to collect the baseline data required for future development of a whole breath diagnostic platform the use of breath as a non-invasive sampling mechanism offers Warfighters little-to-no interruption to mission activities and provides the opportunity for earlier diagnosis/indication of infection or chemical exposure.</p> <p>FY 2024 Plans:</p> <p>- Continue field validation studies for diagnostics prototypes using synthetic binders and evaluate performance against current gold standard diagnostic methods and integrate enzymes to create inexpensive, on-demand, diagnostics with reduced logistical burdens.</p> <p>- Continue efforts to collect the baseline data required for future development of a whole breath diagnostic platform the use of breath as a non-invasive sampling mechanism offers Warfighters little-to-no interruption to mission activities and provides the opportunity for earlier diagnosis/indication of infection or chemical exposure.</p> <p>- Initiate efforts to identify and establish testing methods utilizing low to minimally invasive clinical matrices. Matrices like breath, sweat or interstitial fluid could significantly expand field-forward testing abilities and minimize requirements for trained personnel to collect and administer testing.</p> <p>FY 2023 to FY 2024 Increase/Decrease Statement:</p>	-	1.693	3.839

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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2022	FY 2023	FY 2024
Increase due to change in program/project technical parameters.			
<p>Title: 6) Emerging Threats</p> <p>Description: Push beyond the boundaries of the traditional threat list in the field of diagnostics to better prepare for surprise. Development of diagnostic systems that leverage novel approaches to characterize pathogen or host response and can identify the classification of threat (e.g., bacterial vs viral) from an unknown sample. Invest in diagnostic tests that enable the delivery of actionable information, such as administering the appropriate medical countermeasure (e.g. antibiotic, antiviral, vaccine), by a medic or primary care provider greatly improves turnaround time for soldier wellness and return to duty.</p> <p>FY 2023 Plans:</p> <ul style="list-style-type: none"> - Complete efforts on several complementary approaches to address challenges in small molecule toxin diagnosis at the point of contamination (POC) and initiate validation of these prototypes for potential use as a threat agnostic capability to enable field-forward responses to emerging threats. - Complete the development of a universal blood sample preparation platform to be compatible with several diagnostic systems, improving the speed of sample preparation tools at low pathogen concentrations (i.e. pre-symptomatic levels) is one of the biggest challenges holding back diagnostics in point-of-care, outbreak, and remote testing scenarios. <p>FY 2024 Plans:</p> <ul style="list-style-type: none"> - Initiate efforts to identify novel platforms that are capable of identifying broad classes of toxins in complex matrices. These platforms will ideally enable the diagnosis of exposure to toxins as well as other biological threats, resulting in a broad-spectrum capability in the hands of the warfighter. - Begin preliminary research efforts to diagnose biological threats that are truly unknown but could cause genomic or proteomic changes in infected individuals. <p>FY 2023 to FY 2024 Increase/Decrease Statement: Minor change due to routine program adjustments.</p>	-	2.773	2.443
<p>Title: 7) Diagnostic Building Blocks - Enhanced Biodefense (ENBD)</p> <p>Description: This effort will focus on Assay Development and Delivery Pipeline, Expand Biological Artificial Intelligence for Diagnostics (BioAID) Efforts as well as developing novel, state of the art capabilities that lay the foundation for modernizing other areas within the diagnostics portfolio. This includes exploiting areas such as synthetic biology and chemistry to develop novel and rapid diagnostic tests for utilization in the event of an outbreak of an unknown threat. Invest in efforts that lead to accelerated assay development timelines and optimized test parameters through leveraging artificial intelligence (AI) and machine learning (ML) to allow us to quickly pivot and develop assays for emerging threats and speed up development to days instead of weeks.</p> <p>FY 2023 Plans:</p>	-	6.500	4.100

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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2022	FY 2023	FY 2024
<p>- Expand work with collection & analysis of individual's breath, skin emissions or other minimally invasive testing methods which offers Warfighters little-to-no interruption to mission activities and provides the opportunity for earlier diagnosis/indication of infection or chemical exposure.</p> <p>FY 2024 Plans:</p> <p>- Continue collection & analysis of individual's breath, skin emissions or other minimally invasive testing methods and adapt to possible prototypes which offers Warfighters little-to-no interruption to mission activities and provides the opportunity for earlier diagnosis/indication of infection or chemical exposure.</p> <p>FY 2023 to FY 2024 Increase/Decrease Statement: Decrease due to change in program/project technical parameters.</p>			
<p>Title: 8) Emerging Threats - Enhanced Biodefense (ENBD)</p> <p>Description: This effort will focus on Novel Non-Invasive Screening and Characterization. It will push beyond the boundaries of the traditional threat list in the field of diagnostics to better prepare for surprise. Development of diagnostic systems that leverage novel approaches to characterize pathogen or host response and can identify the classification of threat (e.g., bacterial vs viral) from an unknown sample. Invest in diagnostic tests that enable the delivery of actionable information, such as administering the appropriate medical countermeasure (e.g. antibiotic, antiviral, vaccine), by a medic or primary care provider greatly improves turnaround time for soldier wellness and return to duty.</p> <p>FY 2023 Plans:</p> <p>- Complete training and development efforts by the Army Medical Research Institute for Infectious Disease (USAMRIID) to become an authorized developer of assays for the Cepheid Flex Cart technology supporting the Man Portable Diagnostic System (MPDS).</p> <p>- Initiate efforts to explore innovative methods to investigate genetically modified threats including pre-symptomatic, host-based biomarkers or synthetic biology approaches. Novel methods will allow for rapid assay fielding potentially cutting development time from months to weeks.</p> <p>- Accelerate next generation diagnostic platform development to meet the evolving needs of the CBDP enterprise, providing diagnostics that would address detection and identification technology needs with a combined affinity based and molecular platform for emerging pathogens.</p> <p>- Initiate effort to predict disease severity to provide agnostic disease screening tool that enhances triage, transport and resource decision making support for the Warfighter in field forward environments.</p> <p>- Expand agnostic biomimetic sensing to explore additional panels of small and large molecular weight toxins with various modes of activity, and tested in both clinical and aerosol sample matrices to include environmental background.</p> <p>FY 2024 Plans:</p>	-	8.000	5.200

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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2022	FY 2023	FY 2024
<ul style="list-style-type: none"> - Continue efforts to explore innovative methods to investigate genetically modified threats including pre-symptomatic, host-based biomarkers or synthetic biology approaches. Novel methods will allow for rapid assay fielding potentially cutting development time from months to weeks. - Continue next generation diagnostic platform development to meet the evolving needs of the CBDP enterprise, providing diagnostics that would address detection and identification technology needs with a combined affinity based and molecular platform for emerging pathogens. - Continue effort to predict disease severity to provide agnostic disease screening tool that enhances triage, transport and resource decision making support for the Warfighter in field forward environments. - Continue agnostic biomimetic sensing to explore additional panels of small and large molecular weight toxins with various modes of activity, and tested in both clinical and aerosol sample matrices to include environmental background. <p>FY 2023 to FY 2024 Increase/Decrease Statement: Decrease due to change in program/project technical parameters.</p>			
<p>Title: 9) Unconventional Detection Modalities - Enhanced Biodefense (ENBD)</p> <p>Description: Develop disruptive technologies to identify unknown or emerging threats and develop sensors that can operate in complex threat environments with high fidelity. This thrust area supports others as appropriate to the Joint Force mission needs (e.g., expeditionary, perimeter defense, or unmanned reconnaissance).</p> <p>FY 2023 Plans:</p> <ul style="list-style-type: none"> - Expand Assays on Demand (AoD) for emerging biological threat detection. AoD will allow for real time assay manufacturing reducing supply chain constraints typically seen in currently fielded systems. <p>FY 2024 Plans:</p> <ul style="list-style-type: none"> - Continue Assays on Demand (AoD) for emerging biological threat detection. AoD will allow for real time assay manufacturing reducing supply chain constraints typically seen in currently fielded systems. <p>FY 2023 to FY 2024 Increase/Decrease Statement: Decrease due to change in program/project technical parameters.</p>	-	2.000	1.000
<p>Title: 10) Distributed CB Reconnaissance - Biological Detection</p> <p>Description: Developing capability to warn and inform the Joint Force of operationally-relevant threat utilizing sampling and sensing payloads on manned and unmanned systems (e.g. UAS, UGS). Point sensors on manned and unmanned assets will remotely sense threats relevant to mission environment at presumptive echelon of Integrated Layered Defense and Integrated Early Warning.</p>	-	3.614	1.313

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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2022	FY 2023	FY 2024
<p><i>FY 2023 Plans:</i></p> <ul style="list-style-type: none"> - Continue to invest in low size, weight, power, and cost technologies for near-real time detection capabilities for deployable or distributed biological and chemical sensing for hazard awareness and assessment of operational environments. - Invest in innovative technologies to increase situational awareness using manned and unmanned platforms and provide operational advantages to the Warfighter. - Explore application of advanced computational tools, Artificial Intelligence (AI) and Machine Learning (ML), to connect multiple sensor technologies to provide improved early warning and integrated threat awareness <p><i>FY 2024 Plans:</i></p> <ul style="list-style-type: none"> - Continue to explore fundamental science and novel technologies to increase sensing performance through enhanced speed and specificity; low size, weight, and power; and reduced consumables and life-cycle costs of fielded biological sensors. - Continue developing biological threat sensing and sampling systems, to include unmanned and manned platforms. - Continue to evaluate the use of computational tools, like machine learning into detector/identifier technologies to further reduce false reporting due to environmental factors. <p><i>FY 2023 to FY 2024 Increase/Decrease Statement:</i> Decrease due to change in program/project technical parameters.</p>			
<p><i>Title:</i> 11) Emerging and Enhanced Biothreat Sensing</p> <p><i>Description:</i> Establish a capability to rapidly develop advanced, agile, pathogen-agnostic laboratory and field forward detection capabilities to detect emerging and enhanced biological threats across all force echelons (presumptive, field confirmatory, theater validation, and definitive identification). Further, multi-omics and data sciences (MODS) - multiple biological measurements - will be used to modernize laboratory capabilities and leverage synthetic biology methods and tools to deliver enhanced biothreat sensing/detection capabilities to the Joint Force.</p> <p><i>FY 2023 Plans:</i></p> <ul style="list-style-type: none"> - Continue development of detection algorithms and laboratory workflows to identify threats in unknown samples. - Continue automated computational tools to design and expedite assay development for biological detection. - Continue applied research component of far-forward pathogen agnostic sensing toolkit development. - Pursue advanced biological measurements and data processing techniques into sensor development to enable an agile response to emerging threats with emerging pathogen targeted detection capabilities. <p><i>FY 2024 Plans:</i></p> <ul style="list-style-type: none"> - Continue development of detection algorithms, laboratory workflows, and implementation of bioinformatics analysis tools to identify threats in unknown samples 	-	10.753	12.922

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B. Accomplishments/Planned Programs (\$ in Millions)		FY 2022	FY 2023	FY 2024
<ul style="list-style-type: none"> - Continue incorporating advanced biological measurements and data processing techniques to detect biological threats. - Continue to leverage Assays on Demand (AoD) to develop computational tools to design and expedite assay development for biological detection. <p>FY 2023 to FY 2024 Increase/Decrease Statement: Increase due to change in program/project technical parameters.</p>				
<p>Title: 12) Unattended Perimeter Monitoring - Biological Detection</p> <p>Description: Aims to enhance situational awareness against potential biological hazards by developing monitoring solutions to provide continuous, synchronous information of the operational environment and dynamic threat landscape. Capabilities developed here will focus on autonomy and improved accuracy and reliance that decreases operational burden to the Warfighter.</p> <p>FY 2023 Plans:</p> <ul style="list-style-type: none"> - Continue to evaluate the use of computational tools, like machine learning, into detector/identifier technologies to further reduce false reporting due to environmental factors. - Continue to make technological improvements to enhance early warning of aerosolized biological threats. <p>FY 2024 Plans:</p> <ul style="list-style-type: none"> - Continue to make technological improvements to enhance early warning of aerosolized biological threats. <p>FY 2023 to FY 2024 Increase/Decrease Statement: Decrease due to change in program/project technical parameters.</p>		-	4.871	1.771
<p>Title: 13) Unconventional Detection Modalities - Biological Detection</p> <p>Description: Focuses on developing and evaluating novel, disruptive sensor approaches to address Joint Force needs and modernize existing biological detection technologies that go beyond current technologies.</p> <p>FY 2023 Plans:</p> <ul style="list-style-type: none"> - Continue refinement of novel optical detector for bioaerosols modernizing current technologies. - Explore innovative detection methods such as synthetic or organ on a chip biosensors to provide agent agnostic techniques that identify an unknown as hazardous to a human. - Continue to integrate advanced computational tools, Artificial Intelligence (AI)/Machine Learning (ML) into sensor development to improve speed of detection, reduce false alarms and enable integration of data from multiple detection sources. - Initiate Assays on-Demand efforts aimed to rapidly deliver novel assay solutions to be used in the field. <p>FY 2024 Plans:</p>		-	5.581	5.276

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Chemical and Biological Defense Program		Date: March 2023
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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2022	FY 2023	FY 2024
<ul style="list-style-type: none"> - Continue Assays on Demand (AoD) to augment targeted detection modalities that focus on rapid delivery of novel assay development solutions. - Continue investigating alternative optical detection development not reliant on fluorescence for real-time detection of anomalous biological activity. - Continue evaluating the feasibility of organ-on-a-chip technologies for agent-agnostic techniques. <p>FY 2023 to FY 2024 Increase/Decrease Statement: Minor change due to routine program adjustments.</p>			
<p>Title: 14) Employment Characterization</p> <p>Description: Employment Characterization studies refine threat assessments and identifies potential impacts of indoor and/or outdoor releases of threat agents on CBDP operations, strategy, and capabilities. These studies directly define the Warfighter threat space by determining how CB agents behave when released. This effort reduces risk to the CBDP Enterprise by closing knowledge gaps and informing on the type, extent and magnitude of a potential hazard a warfighter may face in an operational environment. Employment Characterization will: review state of knowledge on agent employment (laboratory and outdoors) to identify gaps and TAS assessment opportunities; continue coordination with international partners to leverage skills and resources; develop closer linkages to hazard prediction modelers to identify knowledge gaps and TAS opportunities; prepare evaluation of potential munitions for applicability to potential future threats based on performance characteristics; and continue chamber tests and operational trials as appropriate for compounds of interest.</p> <p>FY 2023 Plans:</p> <ul style="list-style-type: none"> - Continue to review state of knowledge on agent employment (laboratory and outdoors) to identify gaps and threat agent science assessment opportunities. - Continue studying scale employment methods and feasibility for emerging threat agents. - Begin Toxin Dissemination Efficiency and Anti-Material Efficacy Characterization studies. <p>FY 2024 Plans:</p> <ul style="list-style-type: none"> - Continue to assess state of knowledge on agent employment (laboratory and outdoors) to identify gaps and threat agent science opportunities. - Continue studying different scale employment methods and their feasibility for use with emerging threat agents. - Continue Toxin Dissemination Studies and Anti-Material Efficacy Characterization studies. <p>FY 2023 to FY 2024 Increase/Decrease Statement: Minor change due to routine program adjustments.</p>	-	4.657	5.358
<p>Title: 15) Environmental Response</p>	-	6.042	6.037

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Chemical and Biological Defense Program		Date: March 2023
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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2022	FY 2023	FY 2024
<p>Description: Environmental Response evaluates CB threats to understand how they will behave in the environment (e.g., persistence, degradation, decomposition), along with the effects of environmental conditions (e.g., ozone, ultraviolet, humidity, etc.) on those agents; evaluates CB threat agents on soil, water, and plants, and operational surfaces such as clothing, structures, and equipment; reduces risk to the CBDP Enterprise by closing knowledge gaps and informing on the type, extent and magnitude of a potential hazard a warfighter may face in an operational environment. Small-scale laboratory measurements are used to predict the larger-scale behavior and fate of the agents in outdoor and operational settings, while examining agents deposited on operationally relevant substrates refines our understanding of their environmental persistence and hazards. Knowledge obtained from Environmental Response is used to inform operators, predictive model development, and capability development.</p> <p>FY 2023 Plans:</p> <ul style="list-style-type: none"> - Continue evaluating stability of toxin and viral threats, including exploring the fundamental characteristics that influence viral stability in the environment. - Continue closing knowledge gaps associated with aerosol biology and its implications with the outdoor release of biological threats. - Continue environmental characterization of chemical threats, increasing evaluation of degradation products and reaction byproducts for detection, diagnostics and other applications. <p>FY 2024 Plans:</p> <ul style="list-style-type: none"> - Continue evaluating stability of toxin and viral threats, including exploring the fundamental characteristics that influence viral stability in the environment. - Continue closing knowledge gaps associated with aerosol biology and its implications with the outdoor release of biological threats. - Continue environmental characterization of chemical threats, and increasing evaluation of degradation products and reaction byproducts for detection, diagnostics and other applications. <p>FY 2023 to FY 2024 Increase/Decrease Statement: Minor change due to routine program adjustments.</p>			
<p>Title: 16) First Look (Chemical and Biological)</p> <p>Description: First Look provides the initial evaluation of known and emerging threat agents to determine their potential hazard to the Warfighter. For both chemical and biological agents, this initial fundamental risk assessment includes evaluation of synthesis and toxicity screening for chemicals and toxins and growth and/or virulence for biological agents as well as production and feasibility of weaponization for all agents; evaluates threat agents and develop methods and capabilities to quickly and accurately characterize chemical, biological, and toxin threat agent properties. First Look products/data inform warfighter mission</p>	-	9.850	9.910

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Chemical and Biological Defense Program		Date: March 2023
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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2022	FY 2023	FY 2024
<p>planning, requirements generation, capability development, model development, the larger CBDP Enterprise, Intelligence and other government stakeholders about known or emerging agent threats.</p> <p>FY 2023 Plans:</p> <ul style="list-style-type: none"> - Continue developing innovative laboratory tools and approaches to enable expedient characterization of emerging or novel biological threats (to include highly infectious and novel organisms), including understanding enabling technologies' impact to gene modification/expression and the ability to assess toxin activity. - Continue developing advanced methods for threat agent characterization, including more complex chemical agent mixtures or combinations. - Continue evaluating findings of technological advancement implications to discounted threats study. <p>FY 2024 Plans:</p> <ul style="list-style-type: none"> - Continue developing innovative laboratory tools and approaches to enable expedient characterization of emerging or novel biological threats (to include highly infectious and novel organisms), including understanding enabling technologies' impact to gene modification/expression and the ability to assess toxin activity. - Continue developing advanced methods for threat agent characterization, including complex chemical agent mixtures or combinations. - Continue evaluating findings of technological advancement implications to discounted threats study. <p>FY 2023 to FY 2024 Increase/Decrease Statement: Minor change due to routine program adjustments.</p>			
<p>Title: 17) Host Response</p> <p>Description: Host Response assesses the human response of exposure to CB threat agents using operationally relevant exposure scenarios (acute versus chronic) and exposure routes (e.g., inhalation, dermal, ingestion, etc.) and appropriate assessment methods and models. Data from host response studies is used to develop quantitative exposure limits and qualitative information (e.g., mechanism of action) to inform Warfighter mission planning, requirements generation, capability development, model development, the larger CBDP Enterprise, Intelligence and other government stakeholders. Host Response includes predictive capabilities for rapidly assessing the human response to chemical and biological threat agents; works to close known knowledge gaps associated with traditional threats, including exploring synergistic effects associated with combinatorial agent exposures; assesses bioavailability of threats that are encapsulated to understand host response differences between exposures to encapsulated versus un-encapsulated threats.</p> <p>FY 2023 Plans:</p> <ul style="list-style-type: none"> - Continue to build on and develop predictive methods and technologies for CB agent characterizations. 	-	12.643	13.500

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Chemical and Biological Defense Program		Date: March 2023
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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2022	FY 2023	FY 2024
<ul style="list-style-type: none"> - Continue studies to address host response areas identified by gap analysis studies for traditional biological agents. - Deliver IOC (initial operating capacity) for CRISTAL (Computational Rapid Identification and Scientific Threat Analysis) incorporating results into future host response. Continue to enhance and modernize CRISTAL methods and tools. - Continue to assess the human (host) response to novel and emerging threats (including combinatorial and mixtures). <p>FY 2024 Plans:</p> <ul style="list-style-type: none"> - Continue to build on and further develop predictive methods and technologies for CB agent characterizations. - Continue studies to address host response areas identified by gap analysis studies for traditional biological agents. - Begin improvements/upgrades for CRISTAL (Computational Rapid Identification and Scientific Threat Analysis). Continue to enhance and modernize CRISTAL methods and tools. - Continue to assess the human (host) response to novel and emerging threats (including combinatorial threats and mixtures). <p>FY 2023 to FY 2024 Increase/Decrease Statement: Minor change due to routine program adjustments.</p>			
<p>Title: 18) Technical Surprise</p> <p>Description: Technical Surprise assesses technological advancements for potential implications to the threat space, including agent use and release. Include horizon scanning to identify potential areas of concern and conduct technical assessments of emerging technological advancements (e.g., biotechnology, artificial intelligence, machine learning, quantum computing); develops capabilities to evaluate and assess technical enhancements that may alter the nature or magnitude of a threat agent; evaluates emerging technologies and convergence of technologies that improve the ease of threat use and make threats more likely to survive being released; identifies the limitations and barriers associated with synthetic biology and assess the implications, and identify and assess former technology hurdles that have been lowered or overcome and assess implications of increasing potential threat.</p> <p>FY 2023 Plans:</p> <ul style="list-style-type: none"> - Continue identifying and assessing technological advancements that will impact the chemical and biological threat space, including potential threats that are not specifically chemical or biological in nature, but have implications to chemical and biological defense capabilities. - Continue a horizon scanning capability to provide situational awareness in assessing technological growth and convergence that can affect the chemical and biological threat space, while keeping abreast of changes in the nature of future threats. - Continue the assessment of synthetic biological tools and other biotechnology developments that can enhance or alter the threat space. - Enhance evaluation of converging technologies and their implications to the threat space. <p>FY 2024 Plans:</p>	-	4.007	4.500

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Chemical and Biological Defense Program		Date: March 2023
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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2022	FY 2023	FY 2024
<ul style="list-style-type: none"> - Continue identifying and assessing technological advancements that will impact the chemical and biological threat space, including potential threats that are not specifically chemical or biological in nature but have implications with respect to chemical and biological defense capabilities. - Continue a horizon scanning capability to provide situational awareness in assessing technological growth and convergence that may affect the chemical and biological threat space, while keeping abreast of changes in the nature of future threats. - Continue the assessment of synthetic biological tools and other biotechnology developments that can enhance or alter the threat space. - Enhance evaluation of converging technologies and their implications to the threat space. <p>FY 2023 to FY 2024 Increase/Decrease Statement: Minor change due to routine program adjustments.</p>			
<p>Title: 19) Technical Surprise - Enhanced Biodefense (ENBD)</p> <p>Description: This effort will focus on Advanced Pathogen and Emerging Threat Characterization with attention on characterizing host responses and pathogen signatures using multi-omic analyses and enabling technologies to develop the ability to characterize known and emerging threats. This effort will include understanding the host response to various pathogen insults to identify patterns of response that allow for the prediction of novel threat agents based on the host responses they generate. Evaluations of pathogenesis and viral transmission to understand differences in disease severity will also be conducted. Within this program, efforts to characterize synthetic and natural viral pathogens to compare varying gene expressions between the two will be executed. This program accelerates the ability to characterize emerging threats and will generate more robust data sets for training threat agnostic tools to provide better characterization capabilities.</p> <p>FY 2023 Plans:</p> <ul style="list-style-type: none"> - Begin the development of a robust characterization pipeline capable of characterizing emerging pathogens. - Begin the development of robust threat agnostic tools to characterize emerging pathogens. <p>FY 2024 Plans:</p> <ul style="list-style-type: none"> - Continue the development of a robust characterization pipeline capable of characterizing emerging pathogens. - Continue the development of robust threat agnostic tools to characterize emerging pathogens. <p>FY 2023 to FY 2024 Increase/Decrease Statement: Increase due to fact of life change in the program/project.</p>	-	1.500	3.500
<p>Title: 20) Distributed CB Reconnaissance - Chemical Detection</p> <p>FY 2024 Plans:</p>	-	-	2.322

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Chemical and Biological Defense Program		Date: March 2023		
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B. Accomplishments/Planned Programs (\$ in Millions)		FY 2022	FY 2023	FY 2024
<ul style="list-style-type: none"> - Continue to explore fundamental science and novel technologies to increase sensing performance through enhanced speed and specificity; reduced size, weight, and power; and reduced consumables and life-cycle costs of fielded chemical sensors. - Continue developing chemical threat sensing and sampling systems, to include unmanned and manned platforms. - Continue to evaluate the use of computational tools, like machine learning, into detector/identifier technologies to further reduce false reporting due to environmental factors. <p>FY 2023 to FY 2024 Increase/Decrease Statement: Program/project funding transferred from another funding line.</p>				
<p>Title: 21) Expeditionary Analytical Toolkit (ExAnT) - Chemical Detection</p> <p>Description: Provide general and specialized forces with the ability to modernize detection technologies for traditional threats while enhancing detection capabilities for non-traditional, emerging, and mixed chemical hazards.</p> <p>FY 2023 Plans:</p> <ul style="list-style-type: none"> - Continue to support expeditionary forces in leveraging reach-back capabilities for identification purposes. Invest in novel detection capabilities to address opioids and emerging chemical threats. - Continue to invest in improvements of current detection technologies for chemical hazards in complex and obscurant-heavy environments. <p>FY 2024 Plans:</p> <ul style="list-style-type: none"> - Continue to invest in novel detection capabilities to address opioids and emerging chemical threat, focusing on developing more analogue agnostic capabilities. - Continue to invest in improvements of current detection technologies for chemical hazards in obscurant-heavy environments by improving currently-fielded detectors to provide early warning of chemical threats and offer robust performance in the future battlespace. <p>FY 2023 to FY 2024 Increase/Decrease Statement: Minor change due to routine program adjustments.</p>		-	3.296	3.616
<p>Title: 22) Unattended Perimeter Monitoring - Chemical Detection</p> <p>Description: Establish a layered defense capability by developing and implementing automated and integrated technologies enabling unattended monitoring for chemical threats. These technologies will provide early warning of vapor, aerosol, solid, and liquid hazards and unencumber the Warfighter by reducing logistics and operator burden. Providing a reliable detect-to-warn capability at fixed or expeditionary sites will enhance the overall protective posture of ground and maneuver forces as robust technologies can be miniaturized for portability and operational sustainment.</p>		-	-	3.054

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Chemical and Biological Defense Program		Date: March 2023
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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2022	FY 2023	FY 2024
<p>FY 2024 Plans: - Continue to make technological improvements to enhance early warning of vapor, aerosol, solid, and liquid hazards.</p> <p>FY 2023 to FY 2024 Increase/Decrease Statement: Program/project funding transferred from another funding line.</p>			
<p>Title: 23) Unconventional Detection Modalities - Chemical Detection</p> <p>Description: Develop disruptive technologies to identify unknown or emerging chemical threats and develop chemical sensors that can operate in complex threat environments with high fidelity. This thrust area supports others as appropriate to the Joint Force mission needs (e.g., expeditionary, perimeter defense, or unmanned reconnaissance). This thrust area will also explore utilizing machine learning and other advanced computational tools to increase detection and identification accuracy, reduce false alarms, and enable mapping of hazardous locations to support Integrated Early Warning (IEW) capabilities.</p> <p>FY 2024 Plans: - Continue pursuing advances in photonic integrated circuits by reducing size, weight and power of traditional photonic sensors but keeping the selectivity and sensitivity of a traditional sensor. - Incorporate early warning and threat mapping using machine learning (ML)/artificial intelligence (AI) tools to aggregate and analyze sensor data in real-time. - Continue library-less detection to surmount current sustainment limitations of library-based or analyte-specific chemical sensor to be updated to detect emerging threats. - Continue development in ML and AI to make sensor detection faster with reduced false alarm rates.</p> <p>FY 2023 to FY 2024 Increase/Decrease Statement: Program/project funding transferred from another funding line.</p>	-	-	2.443
Accomplishments/Planned Programs Subtotals	-	112.952	119.182

C. Other Program Funding Summary (\$ in Millions)

<u>Line Item</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u> <u>Base</u>	<u>FY 2024</u> <u>OCO</u>	<u>FY 2024</u> <u>Total</u>	<u>FY 2025</u>	<u>FY 2026</u>	<u>FY 2027</u>	<u>FY 2028</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
• UN3: <i>Understand (ATD)</i>	-	68.415	83.825	-	83.825	81.392	87.384	73.515	71.015	Continuing	Continuing

Remarks

D. Acquisition Strategy

N/A

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COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
PT2: <i>Protect (Applied Research)</i>	-	0.000	58.091	55.057	0.000	55.057	56.153	57.817	61.452	61.452	Continuing	Continuing

A. Mission Description and Budget Item Justification

The Protect Applied Research Project provides the Joint Force the ability to prevent the effects from exposure to chemical and biological hazards. PT2 emphasizes increasing protection capability and reducing physiological effects, preventing or reducing individual and collective exposures, applying prophylaxis to prevent or mitigate negative physiological effects, and protecting critical equipment in Chemical, Biological, Radiological, and Nuclear (CBRN) environments. In FY 2023, the Chemical Biological Defense Program (CBDP) RDT&E Projects have been restructured to align with the CBDP portfolio construct. PT2 efforts in FY 2022 remain in Projects CB2 and TM2. This restructuring provides standardization and alignment across CBDP research, development and acquisition efforts.

Thrust Areas included in this Project are:

- (1) Biological Warfare Defense Prophylaxis
- (2) Air Purification Enhancements
- (3) All-Hazards & Respiratory Protection
- (4) Dynamic Multifunctional Materials for Second Skin
- (5) Enhanced Survivability Coatings
- (6) Lightweight Protective Garments
- (7) Multifunctional Materials for Protection
- (8) Nerve Agent Prophylaxis/Pretreatments
- (9) Reactivators of AChE as Therapeutics (ReACT)

Biological Warfare Defense Prophylaxis: Provides the Warfighter protection against biothreat agents through the pre-exposure administration of prophylactics against known bacterial, viral and toxin agents of interest and emerging infectious threats. Medical countermeasure (MCM) strategies against broader classes of biological agents will be pursued with emphasis on broad-spectrum protection based on mechanism of action. Platform technologies will be utilized and adapted to maximize flexibility, increase stability, shelf life, and expand storage conditions. Efforts will also be adapted to maximize delivery flexibility through modifying delivery routes, which will allow for dose and reagent sparing. Efforts include additional investments in enhanced biodefense and pandemic preparedness.

Air Purification Enhancements: Optimizes and extends filter life and reduces lifecycle costs while maintaining or enhancing protection against all chemical weapons agents and toxic industrial chemicals/materials. Improves integration of collective protection into developmental Service major combat platforms. Investigates existing filtration performance against emerging and non-traditional threats and identify and develop countermeasures.

All Hazards and Respiratory Protection: Develops next generation general purpose mask that unencumbers the Warfighter, integrates with existing system technology, and closes capability gaps in current technologies. Supports special purpose units (e.g., special operations, Civil Support Teams, Explosive Ordnance Disposal) and

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Chemical and Biological Defense Program **Date:** March 2023

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modernization efforts to insert new, scalable protection technologies into current respirator programs of record that protect against the full spectrum of threats for the full range of military operations.

Dynamic Multifunction Materials for Second Skin: Efforts support percutaneous protection and will utilize responsive technologies to provide chemical and biological protective suits that adapt to the environment by synthesizing scaled samples via roll-to-roll manufacture which exhibit materials properties that reduce thermal burden and integrate with current combat garments. These technologies include interpenetrating polymer networks that will change moisture permeability and molecular selectivity on demand, and membranes with higher moisture vapor transfer rates than existing fabrics.

Lightweight Protective Garments: Advances garment material and ensemble technologies with revolutionary capability improvements using integrated, low encumbrance garment designs and fabrication for thermal burden reduction. Incorporates state-of-the-art threat protection technologies and supporting test methodologies and methods that provide operationally relevant, comparable test data on garments. Improves testing methods for rapid, operationally-relevant, consistent garment performance evaluation.

Enhanced Survivability Coatings: Addresses materiel surface ease of decontamination and resistance to chemical agent penetration. Develops durable temporary coatings that resist chemical agent absorption and are quickly decontaminated in the field and allow the rapid regeneration of combat power.

Multifunctional Materials for Protection: Supports Protection and Hazard Mitigation Core Capability Areas. Combines basic and applied research to discover, develop, engineer, and integrate novel, reactive/catalytic materials into next generation CB defense systems. Engineers and scales material manufacturing to maximize sorption, reactivity, and service life while unencumbering the warfighter. Characterizes materials using state-of-the-art ambient pressure spectroscopies for integration into next generation filters and protective garments that reactively decontaminate chemical warfare agents.

Nerve Agent Prophylaxis/Pretreatments: Obtain the first prophylactic MCMs designed to prevent severe morbidity and mortality upon exposure to nerve agents without the need for additional individual physical protective equipment.

Reactivators of AChE as Therapeutics (ReACT): Provide rapid acting MCMs to counter adverse effects from exposure to nerve agents and maintain force lethality.

B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2022	FY 2023	FY 2024
<p>Title: 1) Biological Warfare Defense Prophylaxis</p> <p>Description: The ultimate protection of the warfighter is achieved by pretreating the warfighter to withstand any biological threat with no adverse side effects from the pretreatment. Such pretreatment would enable the warfighter to work in a less restrictive environment, absent of any personal protective equipment, facilitating the warfighter to operate at peak performance. Efforts support innovative concepts in prophylaxis that support needs specific to the warfighter such as broad spectrum protection, rapid onset to protection, fewer doses required, no cold chain required, and needle-free administration.</p> <p>FY 2023 Plans:</p>	-	26.032	22.116

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Chemical and Biological Defense Program		Date: March 2023
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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2022	FY 2023	FY 2024
<p>Bacterial:</p> <ul style="list-style-type: none"> - Continue development of nanobodies. - Continue plague and melioidosis human surveillance. - Continue non-human primate (NHP) model development for co-infection models. - Continue NHP melioidosis neurological model. - Initiate development of plaque Messenger Ribonucleic Acid (mRNA) vaccine. - Continue to evaluate protective efficacy of Anthrax vaccines against novel Bacillus anthracis strains. <p>Viral:</p> <ul style="list-style-type: none"> - Conduct nonclinical studies for vaccines and pretreatments for Crimean Congo Hemorrhagic Fever viruses. - Complete Marburg virus infection studies of bats. - Continue immune correlate identification for Ebola. <p>Toxins:</p> <ul style="list-style-type: none"> - Increase half-life of monoclonal antibodies (mAb) and scale up manufacturing of mAb against marine toxins. - Continue evaluation of naturally occurring anti-toxins to protect against marine toxins. - Continue to develop novel antitoxin technologies including exploring the use of cell membrane coated nanosponges. - Continue evaluation of toxins and antitoxin prophylaxis in animal models. - Continue to develop functional assays to determine biological activity for various toxins. <p>Broad Spectrum:</p> <ul style="list-style-type: none"> - Continue novel pan virus nanosponge platform development and animal testing to address emerging threats, explore additional applications of nanosponge technology to include emerging toxin and bacterial threats. - Continue development of a prototype broad spectrum neuronal nanosponge platform technology. - Continue exploration of additional strategies and platforms for broad spectrum protection to address protection against emerging threats. <p>FY 2024 Plans:</p> <p>Viral:</p> <ul style="list-style-type: none"> - Continue nonclinical studies for vaccines and pretreatments for Crimean Congo Hemorrhagic Fever viruses. - Discovery and development of broadly protective strategies and nontraditional approaches (e.g., host-directed, nucleic acid, antibody, and immunomodulators) against new and emerging viral threats. - Explore the use of production pipelines for mosaic and/or engineered antigens for rapid deployment into established vaccine platforms. 			

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Chemical and Biological Defense Program		Date: March 2023
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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2022	FY 2023	FY 2024
<ul style="list-style-type: none"> - Continue immune correlate identification for Ebola. - Continue animal model development for viral families to support Emerging Infectious Diseases (EID). - Test protective vaccine/therapeutic layered defense approaches to prevent Ebola Virus respiratory disease. <p>Toxins:</p> <ul style="list-style-type: none"> - Continue half-life extension of monoclonal antibodies (mAb) and scale up manufacturing of mAb against palytoxin. - Continue evaluation of naturally occurring anti-toxins to protect against marine toxins. - Continue development of animal models for evaluation of toxins and antitoxin prophylaxis. - Continue development of functional assays to determine biological activity for various toxins. - Continue evaluation of aptmers as MCM against conotoxins. - Continue characterization of toxin-host cell interactions for the continued development of pretreatment strategies. - Evaluate genetic and genomics approaches to address previously unforeseen threat of deliberate manipulation of threat agents so that they no longer are amenable for detection and neutralization <p>Broad Spectrum:</p> <ul style="list-style-type: none"> - Initial Prototype Development of Broad-spectrum Neuronal Nanosponges to protect against multiple types of neurotoxins. - Evaluate broad spectrum protection strategies based on mechanisms of action. - Expand nanosponge platform to target multiple toxin families. - Continue layered defense testing with candidate vaccine/antibiotic/antibody combinations to broaden protection and avoid interference between medical countermeasure. - Continue to evaluate multiple novel broad spectrum platform strategies for potential use to respond to EID, appropriate prototype pathogens will be used for test & evaluation, emphasis on broad-spectrum protection based on mechanism of action. <p>FY 2023 to FY 2024 Increase/Decrease Statement: Decrease due to change in program/project technical parameters. Decrease due to the Bacterial program does not have funding past FY23 and all work associated with plague mRNA vaccine has been cancelled.</p>			
<p>Title: 2) Biological Warfare Defense Prophylaxis - Enhanced Biodefense (ENBD)</p> <p>Description: This effort will focus on Innate Immune Training and Adjuvant Discovery & Tissue Targeting of Vaccines to enhance immune response. Investments include efforts to strengthen and tune the host immune system through enhancement or stimulation to increase the ability to resist disease progression and spread. Characterization of vaccine platform technologies relative to the way a pathogen or toxin causes disease and how the host immune system responds will be executed to optimize matching of a disease indication with the most appropriate vaccine platform.</p> <p>FY 2023 Plans:</p>	-	16.000	20.000

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Chemical and Biological Defense Program		Date: March 2023
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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2022	FY 2023	FY 2024
<p>- Develop a predictive capability to rapidly identify the optimal vaccine platform with which to counter any particular current, novel or emerging biological threat.</p> <p>- Initiation of projects that identify and evaluate adjuvants/encapsulation formulations/mucosal delivery technologies that can be combined with vaccines to stimulate a customized immunogenicity profile without compromising vaccine safety.</p> <p>FY 2024 Plans:</p> <p>- Continue to develop a predictive capability to rapidly identify the optimal vaccine platform with which to counter any particular current, novel or emerging biological threat.</p> <p>- Continue to identify and evaluate adjuvants/immune modulation technologies that can be combined with vaccines to stimulate a customized immunogenicity profile without compromising vaccine safety.</p> <p>FY 2023 to FY 2024 Increase/Decrease Statement: Additional investment in enhanced biodefense and pandemic preparedness.</p>			
<p>Title: 3) Air Purification Enhancements</p> <p>Description: Existing Collective Protection (ColPro) systems have high life cycle costs driven by maintenance and limited service life. Efforts will focus on optimizing and extending filter life to reduce lifecycle costs while maintaining or improving protection.</p> <p>FY 2023 Plans:</p> <p>- Continue materials testing for effectiveness against novel threats for Next Generation Filtration systems.</p> <p>- Complete and publish report on computational modeling for filter protection against advanced agents.</p> <p>- Complete and publish report on design of high air flow collective protection systems that increase the performance against advanced agents delivered in all states of matter (vapor, aerosol, and liquid) in operationally relevant environments.</p> <p>- Continue to engineer novel filter bed materials for chemical agent destruction, integrate them into next generation filters, and develop methods to assess filter performance in an operationally-relevant environment.</p> <p>- Develop low-cost, continuous operation collective protection engineering standards and guidelines for temp, rapid enhancement of unprotected facilities during pandemic/bio warfare attack.</p> <p>FY 2024 Plans:</p> <p>- Integrate new filtration technologies with more stable, reactive materials into a next generation M98 filter to reduce costs and extending filter operational life.</p> <p>- Continue to assess and mitigate impact of advanced threats on current and developing filtration technologies.</p> <p>- Transition Residual Life Indicator System to Modernization Collective Protection program of record in FY24</p> <p>FY 2023 to FY 2024 Increase/Decrease Statement:</p>	-	4.705	1.169

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Chemical and Biological Defense Program		Date: March 2023
Appropriation/Budget Activity 0400 / 2	R-1 Program Element (Number/Name) PE 0602384BP / <i>Chemical and Biological Defense Program</i>	Project (Number/Name) PT2 / <i>Protect (Applied Research)</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2022	FY 2023	FY 2024
Program/project transitioned to Advanced Development. Decrease due to transition of Residual Life Indicator System to Modernization Collective Protection program of record in early FY24.			
<p>Title: 4) All-Hazards & Respiratory Protection</p> <p>Description: Efforts will improve chemical and biological agent protection while maintaining warfighter capability through integrated research on respirator, seams, closures, and new manufacturing techniques and materials; perform early surveys for end-user jury input with frequent user operational evaluation; focus on low burden next generation protective mask.</p> <p>FY 2023 Plans:</p> <ul style="list-style-type: none"> - Complete evaluate and assess systems that provide chemical biological respiratory protection technologies in support of tactical all hazard, full spectrum respiratory protection system. - Transition operationally-relevant respirator fit testing system to the Joint Service Mask Leakage Tester (JSMLT). - Transition specification for anti-fog lenses in respirators as a Ground Mask modification work order. - Continue to design and test prototypes for a low-encumbrance, next generation protective mask. <p>FY 2024 Plans:</p> <ul style="list-style-type: none"> - Develop designs for innovative, low burden respirator prototypes. - Develop use of innovative manufacturing techniques for respirators, such as 3D facial scanning and additive manufacturing. - Establish operationally-relevant protocols for next generation respiratory protection prototype testing. - Transition microcooling garment to Tactical Advance Threat Protective Ensemble (TATPE) under the UIPE FoS GP program of record. <p>FY 2023 to FY 2024 Increase/Decrease Statement: Program/project transitioned to Advanced Development.</p>	-	1.482	1.026
<p>Title: 5) Dynamic Multifunction Materials for Second Skin</p> <p>Description: Efforts will utilize responsive technologies to provide chemical biological protective suits that adapt to the environment by synthesizing scaled samples via roll-to-roll manufacture which exhibit materials properties that reduce thermal burden and integrate with current combat garments. These technologies include interpenetrating polymer networks that will change moisture permeability and molecular selectivity on demand, and membranes with higher moisture vapor transfer rates than existing fabrics.</p> <p>FY 2023 Plans:</p> <ul style="list-style-type: none"> - Continue development and testing of protective garment materials that respond to the presence of chemical agents to increase Warfighter protection. 	-	1.793	-

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Chemical and Biological Defense Program		Date: March 2023		
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B. Accomplishments/Planned Programs (\$ in Millions)		FY 2022	FY 2023	FY 2024
- Begin integration of responsive systems into protective suit paradigms for whole system testing.				
FY 2023 to FY 2024 Increase/Decrease Statement: Program/project funding transferred to another funding line. Project funding transfers to the Lightweight Protective Garments and Multifunctional Materials for Protection thrust areas starting in FY24.				
Title: 6) Enhanced Survivability Coatings		-	1.178	1.881
Description: Efforts seek to produce enhanced coatings that increase chemical warfare agent survivability and decontaminability of military materiel to levels comparable to that of stainless steel. Improved coatings will resist chemical agent absorption and be quickly decontaminated in field, to rapidly return materiel to unprotected mission operations level.				
FY 2023 Plans:				
- Continue to characterize bio-inspired surface treatments for materiel coatings to repel agents of interest from materiel surfaces.				
- Evaluate and incorporate new or commercially-available appliques (to include chemical transport studies in current military coatings, novel coatings characterization, thin film overcoats, strippable coat, reactive coat, and lock-down coats) in support of CBRN Coatings, Coverings, and Protective Overlays Program of Record.				
- Advance thin repellent film coating systems from fundamental research to applied research test and evaluation.				
FY 2024 Plans:				
- Increase chemical agent resistance of current military coatings through development and testing of novel temporary coatings to reduce the spread of contamination and ease decontamination of military assets.				
- Continue to improve equipment coatings through bio-inspired surface treatments to repel agents of interest from current military equipment coatings.				
- Develop and verify test methods for chemical decontamination efficiency of equipment elastomers, including tire rubber.				
FY 2023 to FY 2024 Increase/Decrease Statement: Minor change due to routine program adjustments.				
Title: 7) Lightweight Protective Garments		-	-	0.234
Description: Efforts will advance garment material and ensemble technologies with new capabilities using integrated garment designs and fabrication for thermal burden reduction, state-of-the-art threat protection technologies, and supporting test methodologies and methods that provide operationally relevant, comparable data on test garments.				
FY 2024 Plans:				
- Manufacture scaled responsive/reactive textile swatch samples that adapt or react to the threat and environment while reducing thermal burden and integrate with current combat garments.				

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Chemical and Biological Defense Program		Date: March 2023		
Appropriation/Budget Activity 0400 / 2	R-1 Program Element (Number/Name) PE 0602384BP / <i>Chemical and Biological Defense Program</i>	Project (Number/Name) PT2 / <i>Protect (Applied Research)</i>		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2022	FY 2023	FY 2024
- Test scaled responsive/reactive textile swatch samples using whole system test methods.				
<p>FY 2023 to FY 2024 Increase/Decrease Statement: Program/project funding transferred from another funding line. Project funding transferred from the Dynamic Multifunctional Materials for Second Skin thrust area which ends in FY23.</p>				
<p>Title: 8) Multifunctional Materials for Protection</p> <p>Description: Efforts will discover, develop and integrate novel, reactive/catalytic materials and scale material manufacturing with maximum sorption and reactivity. They will characterize materials using state-of-the-art in operando and ambient pressure spectroscopies for eventual integration into next generation decontaminants, coatings, filters, and protective garments that reactively decontaminate chemical warfare agents.</p> <p>FY 2023 Plans:</p> <ul style="list-style-type: none"> - Continue to engineer reactive/catalytic nano-structure materials from basic research efforts for chemical agent destruction, to feed air purification enhancement. - Continue to integrate engineered reactive/catalytic nano-structure materials into filters, decontaminants, and textiles to assess materials in an operationally-relevant environment for personnel decontamination. - Advance next generation materials to design reactive, regenerative protective garments with longer service life and lower thermal burden. <p>FY 2024 Plans:</p> <ul style="list-style-type: none"> - Generate prototype next generation reactive and regenerative protective garment swatches with longer service life and lower thermal burden for whole system testing. - Incorporate novel materials into individual and collective protection filtration systems and test for increased performance against conventional and advanced threats delivered in all states of matter (vapor, aerosol, and liquid) in laboratory. - Begin demonstration of enhanced filter bed performance towards emerging/advanced threats and toxic industrial chemicals/ materials in operationally-relevant environments. - Develop scaled manufacturing techniques for novel materials for incorporation into prototype protection technologies. <p>FY 2023 to FY 2024 Increase/Decrease Statement: Program/project funding transferred from another funding line. Project funding transferred from the Dynamic Multifunctional Materials for Second Skin thrust area which ends in FY23.</p>		-	2.743	5.087
<p>Title: 9) Nerve Agent Prophylaxis/Pretreatments</p> <p>Description: Develop pretreatments and prophylactics that counter chemical warfare agents, including organophosphorus nerve agents (OPNA), using targeted and innovative science and technology efforts that will offer broad-spectrum protection, flexible</p>		-	4.158	2.576

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Chemical and Biological Defense Program		Date: March 2023
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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2022	FY 2023	FY 2024
<p>route of administration, lower dose requirements, and reduced operational and logistical burden. The use of these medical countermeasures (MCM) will protect the lives and effectiveness of our Warfighters, thus maintaining force strength and force capability.</p> <p>FY 2023 Plans:</p> <ul style="list-style-type: none"> - Continue efforts to develop catalytic enzymes for use against selected, priority non-traditional agents (NTA). - Complete expanded pre-clinical studies of lead catalytic scavengers to support future investigative new drug (IND) filing. - Continue efforts to develop capability for rapid development of medical countermeasures. - Continue efforts to explore and further develop novel non-enzyme nerve agent prophylaxis. - Continue new approaches to identify pretreatment and prophylaxis against multiple classes of NTAs and emerging chemical threats. <p>FY 2024 Plans:</p> <ul style="list-style-type: none"> - Continue exploration of the therapeutic efficacy of atipamezole and other FDA-approved and developmental MCMs for non-opioid-based pharmaceutical based agents (PBAs). - Continue cross-toxidromic and pathway analysis to determine possible targets for multi-toxidromic therapeutic MCM discovery and development. - Finish a paper study to identify previous accomplishments, current state of the science and outline a path forward for discovering, developing, and fielding therapeutic MCMs for a broad scope of emerging chemical threats beyond PBAs. <p>FY 2023 to FY 2024 Increase/Decrease Statement: Decrease due to change in program/project technical parameters.</p>			
<p>Title: 10) Reactivators of AChE as Therapeutics (ReACT)</p> <p>Description: Provide rapid acting MCMs to counter adverse effects from exposure to nerve agents and maintain force lethality.</p> <p>FY 2024 Plans:</p> <ul style="list-style-type: none"> - Initiate efforts that utilize modelling and structural activity relationships in order to develop prophylactics with both centrally acting and broad spectrum capabilities. <p>FY 2023 to FY 2024 Increase/Decrease Statement: Increase due to change in program/project technical parameters.</p>	-	-	0.968
Accomplishments/Planned Programs Subtotals	-	58.091	55.057

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Chemical and Biological Defense Program			Date: March 2023			
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C. Other Program Funding Summary (\$ in Millions)

<u>Line Item</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u> <u>Base</u>	<u>FY 2024</u> <u>OCO</u>	<u>FY 2024</u> <u>Total</u>	<u>FY 2025</u>	<u>FY 2026</u>	<u>FY 2027</u>	<u>FY 2028</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
• PT3: <i>Protect (ATD)</i>	-	32.113	29.261	-	29.261	48.969	42.794	46.159	52.581	Continuing	Continuing

Remarks

D. Acquisition Strategy

N/A

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Chemical and Biological Defense Program **Date:** March 2023

Appropriation/Budget Activity 0400 / 2					R-1 Program Element (Number/Name) PE 0602384BP / <i>Chemical and Biological Defense Program</i>				Project (Number/Name) MT2 / <i>Mitigate (Applied Research)</i>			
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
MT2: <i>Mitigate (Applied Research)</i>	-	0.000	73.321	66.371	0.000	66.371	63.832	51.426	59.920	64.824	Continuing	Continuing

A. Mission Description and Budget Item Justification

The Mitigate Applied Research Project emphasizes the ability to conduct decontamination and medical actions that enable the quick restoration of combat power, maintain/recover essential functions that are free from the effects of Chemical, Biological, Radiological, and Nuclear (CBRN) hazards, and facilitate the return to pre-incident operational capability as soon as possible. In FY 2023, the Chemical Biological Defense Program (CBDP) RDT&E Projects have been restructured to align with the CBDP portfolio construct. MT2 efforts in FY 2022 remain in Projects CB2 and TM2. This restructuring provides standardization and alignment across CBDP research, development and acquisition efforts.

Thrust Areas included in this Project are:

- (1) Biological Warfare Defense Therapeutics
- (2) Discovery of Medical Countermeasures Against New and Emerging (DOMANE)
- (3) Chemically Reactive Ocular Wound and Dermal Therapeutics (CROWD)
- (4) Emerging and Pharmaceutical-based Agent Threats (EMPATH)
- (5) Enabling Science
- (6) Reactivators of AChE as Therapeutics (ReACT)
- (7) Enhanced Survivability Coatings
- (8) Equipment Decontamination
- (9) Multifunctional Materials for Protection
- (10) Personnel Decontamination

Biological Warfare Defense Therapeutics: Discovers broad-spectrum bacterial, toxin and viral therapeutics, and label expansion (repurposing) of medical countermeasures that are U.S. Food & Drug Administration (FDA) approved or in advanced stages of clinical development. These efforts are coordinated with Interagency and Department, to leverage public and force/defense health related investments made to minimize risk and speed approval of novel antibiotic countermeasures.

DOMANE: Provides innovative and rapid medical countermeasures (MCMs) development capabilities that reduce developmental risks, cost and schedule associated with MCM fielding, and afford protection against and allow the Joint Force to rapidly respond to traditional, new and emerging biological warfare threat exposures to allow freedom of action.

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Chemical and Biological Defense Program	Date: March 2023
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Appropriation/Budget Activity 0400 / 2	R-1 Program Element (Number/Name) PE 0602384BP / <i>Chemical and Biological Defense Program</i>	Project (Number/Name) MT2 / <i>Mitigate (Applied Research)</i>
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Chemically Reactive Ocular Wound and Dermal Therapeutics (CROWD): Develop a fielded medical countermeasure for the Warfighter that can treat a chemical agent that has breached the skin. Collect the data that the Food and Drug Administration (FDA) will require for approval.

Emerging and Pharmaceutical-based Agent Threats (EMPATH): Assess candidate MCMs and transitions them to partner United States Government entities for development into fieldable drug products. Activities focus on assessing current therapeutic drugs for protection against opioid agents and developing MCMs to treat non-opioid sedatives.

Enabling Science: Leverage technological advances and innovative approaches that will improve the time to develop and field chemical medical countermeasures (MCM) to the Warfighter. Modernize the chemical MCM development process to allow for an earlier assessment of both the safety and efficacy of candidate therapeutics before regulatory submission and to cultivate technologies that enable development efforts across other medical portfolios to improve the ability to conduct MCM testing more cost-effectively with fewer animals.

Reactivators of AChE as Therapeutics (ReACT): Develops broad-spectrum, centrally-acting acetylcholinesterase (AChE) reactivators, that increase survival, reduce morbidity, and decrease neurological damage.

Enhanced Survivability Coatings: Develops temporary coatings that resist chemical agent absorption and are quickly decontaminated in the field and allow the rapid regeneration of combat power.

Equipment Decontamination: Addresses the limited capability to decontaminate personal equipment, weapons, vehicles, ships, and facilities; sensitive equipment, and hazardous waste. Efforts within this thrust seek to develop decontaminant formulations and procedures that reduce or eliminate residual contamination hazards, enable unit-level decontamination with rapid unmasking, reduce logistic needs, enable rapid sorting of clean from dirty to rapidly return high-value equipment to normal use, and to develop improved test methods.

Multifunctional Materials for Protection: Discovers, develops, and integrates novel, reactive/catalytic materials and scale material manufacturing with maximum sorption and reactivity, and characterize materials using state-of-the-art in operando and ambient pressure spectroscopies, for eventual integration into next generation decontaminants that reactively decontaminate chemical warfare agents.

Personnel Decontamination: Develops personnel decontaminants with lower lifecycle costs and storage constraints and determines time, efficacy, and logistics burdens to Warfighters for mass casualty decontamination.

B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2022	FY 2023	FY 2024
Title: 1) Biological Warfare Defense Therapeutics	-	31.034	31.363
Description: This effort funds biomedical research focused on the early discovery and evaluation of therapeutic countermeasures against known and emerging biological warfare (BW) threats for which FDA-approved therapeutics are limited or lacking. BW defense therapeutics mitigate and reverse the effects of known and emerging biological warfare threats in symptomatic			

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Chemical and Biological Defense Program		Date: March 2023
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B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2022	FY 2023	FY 2024
<p>warfighters diagnosed with BW disease. They are the last line of defense against BW threats and are critical to returning symptomatic Warfighters to service. Biomedical research is focused on discovery and development of broad-spectrum therapeutic candidates and therapeutic platforms that target viruses, bacteria or toxins directly, enhance the host response (e.g., by modulating the immune system) and/or relieve BW disease symptoms. Broad-spectrum therapeutic candidates that are shown to be both safe and efficacious against BW threats in small animal models will advance for additional pre-clinical evaluation, and can be accelerated for use against emerging infectious diseases during an outbreak. Therapeutic target identification discovery and evaluation of novel small molecules (chemically synthesized), novel biologic molecules (isolated from natural sources), drug and drug/vaccine combinations (aka layered defense), and repurposing of drugs approved by the FDA for other indications, are included in this research. Development of appropriate animal models and assays in which to evaluate therapeutic candidates is also included. Projects leverage interagency and commercial sector investments to accelerate development and reduce costs.</p> <p>FY 2023 Plans: Viral Therapeutics: - Evaluate conserved targets, including host targets and processes of pathogenesis, for broad-spectrum treatment. - Continue drug discovery and development efforts to prepare for emerging threats by focusing on broad spectrum mechanism of action conserved targets and platform technologies. Upon establishment of proof of concept in small animal models, transition therapeutic candidates to advanced technology development.</p> <p>Bacterial Therapeutics: - Evaluate conserved therapeutic targets, with a focus on circumventing or overcoming antimicrobial resistance, for broad-spectrum treatment. - Continue to discover therapeutic candidates that employ novel strategies and mechanisms, such as new pathogen targets, drug delivery methods, or modulating the immune response, to overcome current and emerging mechanisms of antibiotic resistance in bacterial infections. Upon establishment of proof of concept in small animal models, transition to advanced technology development. - Establish proof of concept efficacy of biologics to treat intracellular bacterial biothreat infections to lay the groundwork for future expansion of investments in biologic therapeutic class.</p> <p>Toxin Therapeutics: - Continue evaluation of repurposed small molecule drug for efficacy in the treatment of multiple serotypes of botulinum neurotoxin (BoNT) in small animal models; evaluate repurposed drug in combination with botulinum antitoxin in small animal models.</p> <p>FY 2024 Plans:</p>			

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Chemical and Biological Defense Program		Date: March 2023
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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2022	FY 2023	FY 2024
<p>Viral Therapeutics:</p> <ul style="list-style-type: none"> - Continue to evaluate conserved targets, including host targets and processes of pathogenesis, for broad-spectrum treatment. - Continue drug discovery and development efforts to prepare for emerging threats by focusing on broad spectrum mechanism of action conserved targets and platform technologies. Upon establishment of proof of concept in small animal models, transition therapeutic candidates to advanced technology development. <p>Bacterial Therapeutics:</p> <ul style="list-style-type: none"> - Continue to evaluate conserved therapeutic targets, with a focus on circumventing or overcoming antimicrobial resistance, for broad-spectrum treatment. - Continue to discover therapeutic candidates that employ novel strategies and mechanisms, such as new pathogen targets, drug delivery methods, or modulating the immune response, to overcome current and emerging mechanisms of antibiotic resistance in bacterial infections. Upon establishment of proof of concept in small animal models, transition to advanced technology development. - Continue to establish proof of concept efficacy of biologics to treat intracellular bacterial biothreat infections to lay the groundwork for future expansion of investments in biologic therapeutic class. <p>Toxin Therapeutics:</p> <ul style="list-style-type: none"> - Continue evaluation of repurposed small molecule drug for efficacy in the treatment of multiple serotypes of botulinum neurotoxin (BoNT) in small animal models in combination with botulinum antitoxin. <p>FY 2023 to FY 2024 Increase/Decrease Statement: Minor change due to routine program adjustments.</p>			
<p>Title: 2) Discovery of Medical Countermeasures Against New and Emerging (DOMANE)</p> <p>Description: Develop and successfully transition emerging technology platforms to identify MCMs, targets, as well as innovative platforms that will support transition to applied programs for clinical trials. These developmental and translational studies will provide a knowledge foundation and broad candidate pipeline that will underpin the availability (via FDA-regulated Expanded Access, Compassionate Use and Emergency Use authorities) of BW MCM to the Joint Force at the speed of relevance to allow freedom of action.</p> <p>FY 2023 Plans:</p>	-	4.334	-

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Chemical and Biological Defense Program		Date: March 2023		
Appropriation/Budget Activity 0400 / 2	R-1 Program Element (Number/Name) PE 0602384BP / <i>Chemical and Biological Defense Program</i>	Project (Number/Name) MT2 / <i>Mitigate (Applied Research)</i>		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2022	FY 2023	FY 2024
<p>- Pursuing high-throughput 3D structural biology, combined with organs-on-a-chip and artificial intelligence/machine learning technologies to transition to applied programs to address mechanisms of action, drug development platforms and medical countermeasure identification.</p> <p>FY 2023 to FY 2024 Increase/Decrease Statement: Program/project terminated in FY 2024.</p>				
<p>Title: 3) Chemical Reactive Ocular Wound and Dermal Therapeutics (CROWD)</p> <p>Description: Focuses on therapeutic strategies to effectively treat Chemical Warfare Agents (CWA) contamination on wounds, eyes, and large areas of intact skin. This effort involves the development of products capable of removing or neutralizing CWA from those routes of exposure, to decrease the toxic load of agent and allow optimal effectiveness of other systemic therapeutics.</p> <p>FY 2023 Plans:</p> <ul style="list-style-type: none"> - Continue advanced preclinical studies to validate safety and efficacy in support of clinical trials. - Continue assessment of candidate products for advanced development. - Refine pathway to regulatory approval and licensure. <p>FY 2024 Plans:</p> <ul style="list-style-type: none"> - Initiate proof of concept test of candidate decontamination products for capability to decontaminate CWAs from wounds. - Determination of dosing strategies for use of candidate products in traumatic wounds. <p>FY 2023 to FY 2024 Increase/Decrease Statement: Decrease due to change in program/project technical parameters.</p>		-	6.351	5.639
<p>Title: 4) Emerging and Pharmaceutical-based Agent Threats (EMPATH)</p> <p>Description: The Warfighter requires effective MCMs that prevent or reverse the adverse effects of Pharmaceutical Based Agents (PBAs) and Emerging Chemical Threats (ECTs), while still allowing for the use of FDA approved drugs (e.g. morphine, fentanyl) by Joint Force Medical Staff for their originally intended purposes of pain management and sedation. This portfolio seeks to develop MCMs that are efficacious against a range of toxidromes, are fast-acting, and have a prolonged protective and/or therapeutic benefit to minimize the potential for re-intoxication and maintain Force Lethality.</p> <p>FY 2023 Plans:</p> <ul style="list-style-type: none"> - Continue to assess drug products for use against other priority PBA emerging threats (e.g., non-opioids). <p>FY 2024 Plans:</p> <ul style="list-style-type: none"> - Continue exploration of the therapeutic efficacy of atipamezole and other FDA-approved and developmental MCMs for non-opioid-based PBAs. 		-	5.586	3.753

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Chemical and Biological Defense Program		Date: March 2023
Appropriation/Budget Activity 0400 / 2	R-1 Program Element (Number/Name) PE 0602384BP / <i>Chemical and Biological Defense Program</i>	Project (Number/Name) MT2 / <i>Mitigate (Applied Research)</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2022	FY 2023	FY 2024
<ul style="list-style-type: none"> - Continue cross-toxidromic and pathway analysis to determine possible targets for multi-toxidromic therapeutic MCM discovery and development. - Finish a paper study to identify previous accomplishments, current state of the science and outline a path forward for discovering, developing, and fielding therapeutic MCMs for a broad scope of emerging chemical threats beyond PBAs. <p>FY 2023 to FY 2024 Increase/Decrease Statement: Decrease due to change in program/project technical parameters.</p>			
<p>Title: 5) Enabling Science</p> <p>Description: Focus on protection of the Warfighter against CWA to maintain force lethality, leverage innovative approaches and emerging technologies to support modernization of chemical medical countermeasure (cMCM) pipeline, and develop and deploy cMCMs more rapidly to the Warfighter. Efforts include: 1) development of Artificial Intelligence/Machine Learning (AI/ML) tools to more efficiently identify cMCMs and assess their safety and efficacy for regulatory submission; 2) AI/ultra-high throughput screening-based sampling of large chemical spaces with the aim of providing broad spectrum cMCMs with improved efficacy and selectivity, minimal toxicity, and decreased expense and fielding times to the warfighter; 3) development of technologies to deliver MCMs across the blood brain barrier (BBB) into the brain; 4) maturation of cMCMs with innovative mechanisms of actions; and 5) development of well characterized or FDA qualified animal models, as needed, to support cMCM discovery and development under the FDA animal rule.</p> <p>FY 2023 Plans:</p> <ul style="list-style-type: none"> - Continue to employ AI/ML-based tools for drug design and predictive drug safety. - Continue to maintain screening and safety databases for drug candidates - Continue to perform select animal and safety studies for lead therapeutic candidates, including anticholinergics, for treatment of CWAs. - Continue to investigate technologies for delivering therapeutics (e.g. 2-pyridine aldoxime methyl chloride/2-PAM) to the brain. - Continue to support the therapeutic candidate pipeline. - Develop well characterized or FDA qualified animal models to support the development of MCMs requiring licensure under the FDA animal rule that provide protection for the Warfighter against CWAs. - Continue to test the safety and efficacy of candidate resurrectors of aged/inhibited enzyme in animal models. - Develop naturally derived MCM with innovative mechanism of action against broad spectrum of organophosphorus nerve agent (OPNA) threats. <p>FY 2024 Plans:</p> <ul style="list-style-type: none"> - Continue to employ AI/ML-based tools for drug design and predictive drug safety. - Continue to maintain screening and safety databases for drug candidates. 	-	12.877	13.878

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Chemical and Biological Defense Program		Date: March 2023		
Appropriation/Budget Activity 0400 / 2	R-1 Program Element (Number/Name) PE 0602384BP / <i>Chemical and Biological Defense Program</i>	Project (Number/Name) MT2 / <i>Mitigate (Applied Research)</i>		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2022	FY 2023	FY 2024
<ul style="list-style-type: none"> - Continue to perform select animal and safety studies for lead therapeutic candidates. - Continue to investigate technologies for delivering therapeutics (e.g. 2-PAM) to the brain. - Continue to support the therapeutic candidate pipeline. - Continue to develop well characterized or FDA qualified animal models to support the development of MCMs requiring licensure under the FDA animal rule that provide protection for the Warfighter against CWAs. - Continue to develop naturally derived MCMs with innovative mechanisms of action against a broad spectrum of OPNA threats. <p>FY 2023 to FY 2024 Increase/Decrease Statement: Minor change due to routine program adjustments.</p>				
<p>Title: 6) Reactivators of AChE as Therapeutics (ReACT)</p> <p>Description: The Warfighter requires rapid acting medical countermeasures (MCMs) to counter adverse effects from exposure to Nerve Agents (NAs) and maintain force lethality. Utilize modelling and structural activity relationships in order to develop prophylactics or therapeutics for acetylcholinesterase enzyme reactivation with both centrally acting and broad spectrum capabilities. Develop potential candidates that will ultimately be submitted for Food and Drug Administration (FDA) licensure or to identify previously licensed products for new uses in the treatment of chemical warfare casualties.</p> <p>FY 2023 Plans:</p> <ul style="list-style-type: none"> - Continue to down select generated chemical libraries to the most promising broad spectrum therapeutic candidates for follow on safety and efficacy assessments. - Continue drug formulation efforts for MCMs with a longer shelf-life and with feasibility of an auto-injector containing material and chemical composition. - Continue development screening for novel broad spectrum enzyme reactivators that are effective in the brain. - Transition critical in vivo data to advanced developer for lead reactivators. <p>FY 2024 Plans:</p> <ul style="list-style-type: none"> - Continue efforts that utilize modelling and structural activity relationships in order to develop therapeutics with both centrally acting and broad spectrum capabilities. - Continue to down select generated chemical libraries to the most promising broad spectrum therapeutic candidates for follow on safety and efficacy assessments. - Continue development screening for novel broad spectrum enzyme reactivators that are effective in the brain. <p>FY 2023 to FY 2024 Increase/Decrease Statement: Minor change due to routine program adjustments.</p>		-	3.779	4.879
<p>Title: 7) Enhanced Survivability Coatings</p>		-	1.071	0.542

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Chemical and Biological Defense Program		Date: March 2023
Appropriation/Budget Activity 0400 / 2	R-1 Program Element (Number/Name) PE 0602384BP / <i>Chemical and Biological Defense Program</i>	Project (Number/Name) MT2 / <i>Mitigate (Applied Research)</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2022	FY 2023	FY 2024
<p>Description: Efforts seek to produce enhanced coatings that increase chemical warfare agent survivability and decontaminatability of military materiel to levels comparable to that of stainless steel. Improved coatings will resist chemical agent absorption and be quickly decontaminated in field, to rapidly return materiel to unprotected mission operations level.</p> <p>FY 2023 Plans:</p> <ul style="list-style-type: none"> - Continue to characterize bio-inspired surface treatments for equipment coatings to repel agents of interest from current military equipment coatings. - Evaluate and incorporate new or commercially-available appliques (to include chemical transport studies in current military coatings, novel coatings characterization, thin film overcoats, strippable coat, reactive coat, and lock-down coats) in support of CBRN Coatings, Coverings, and Protective Overlays Program of Record. - Advance thin repellent film coating systems from fundamental research to applied research test and evaluation. <p>FY 2024 Plans:</p> <ul style="list-style-type: none"> - Continue evaluating polymer coatings as potential temporary or permanent military equipment coatings to decrease logistical burden of decontamination. - Increase chemical agent resistance of current military coatings through development and testing of novel temporary coatings to reduce the spread of contamination and enable more facile decontamination of military assets. - Continue to improve equipment coatings through bio-inspired surface treatments to repel agents of interest from current military equipment coatings. <p>FY 2023 to FY 2024 Increase/Decrease Statement: Decrease due to change in program/project technical parameters.</p>			
<p>Title: 8) Equipment Decontamination</p> <p>Description: The Warfighter has a limited capability to decontaminate personal equipment, weapons, vehicles, ships, and facilities; Sensitive equipment (weapon system optics, electronic equipment, interior spaces, and aircraft); and hazardous waste. Efforts seek to develop decontaminant formulations and procedures that reduce or eliminate residual contamination hazards; enable unit-level decontamination with rapid unmasking; reduce logistic needs (need for water); enable rapid sorting of clean from dirty to rapidly return high-value equipment to normal use; and develop improved realistic test methods.</p> <p>FY 2023 Plans:</p> <ul style="list-style-type: none"> - Transition methodology for testing for effective decontamination of complex surfaces and real-world systems to the Service Equipment Decontamination System or Tactical Contamination Mitigation System programs of record. - Finish development and demonstration of an autonomous decontamination platform to reduce troop-to-task burden of operational decontamination. 	-	5.774	2.925

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Chemical and Biological Defense Program		Date: March 2023		
Appropriation/Budget Activity 0400 / 2		R-1 Program Element (Number/Name) PE 0602384BP / <i>Chemical and Biological Defense Program</i>		Project (Number/Name) MT2 / <i>Mitigate (Applied Research)</i>
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2022	FY 2023	FY 2024
<p>- Develop bioagent disclosure spray and bio contamination mapping technologies into prototypes to demonstrate.</p> <p>FY 2024 Plans:</p> <p>- Refine autonomous equipment decontamination platform to reduce troop-to-task and logistics requirements for operational decontamination.</p> <p>- Transition hot air decontamination technologies to Joint Biological Aircraft Decontamination System and Service Equipment Decontamination Systems programs of record in early FY24.</p> <p>FY 2023 to FY 2024 Increase/Decrease Statement: Decrease due to change in program/project technical parameters.</p>				
<p>Title: 9) Multifunctional Materials for Protection</p> <p>Description: Efforts will discover, develop and integrate novel, reactive/catalytic materials and scale material manufacturing with maximum sorption and reactivity, and characterize materials using state-of-the-art in operando and ambient pressure spectroscopies, for eventual integration into next generation decontaminants and coatings.</p> <p>FY 2023 Plans:</p> <p>- Develop and characterize novel reactive/catalytic materials that decontaminate biological and chemical threats and integrate materials into next generation decontaminants and coatings.</p> <p>FY 2024 Plans:</p> <p>- Integrate reactive materials into decontamination systems for enhanced threat spectrum mitigation.</p> <p>- Continue ambient pressure characterization of reactive chemical decontamination mechanisms.</p> <p>- Scale materials manufacturing processes for cost-efficiency and characterize materials using operationally-relevant conditions.</p> <p>FY 2023 to FY 2024 Increase/Decrease Statement: Increase due to change in program/project technical parameters.</p>		-	1.823	2.222
<p>Title: 10) Personnel Decontamination</p> <p>Description: Efforts will develop decontaminants for decontamination of unbroken skin with lower lifecycle costs and storage constraints and determination of time, efficacy and logistics burdens to warfighters for mass casualty decontamination. Decrease Warfighter burden in the event of a CWA exposure by identifying science and technology gaps in the mass personnel decontamination process as well as possible substitutions for current approved personnel decontamination formulations.</p> <p>FY 2023 Plans:</p> <p>- Develop and use laboratory and animal models to assess physical removal technologies for potential replacement of reactive skin decontamination lotion (RSDL).</p>		-	0.692	1.170

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Chemical and Biological Defense Program		Date: March 2023
Appropriation/Budget Activity 0400 / 2	R-1 Program Element (Number/Name) PE 0602384BP / <i>Chemical and Biological Defense Program</i>	Project (Number/Name) MT2 / <i>Mitigate (Applied Research)</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2022	FY 2023	FY 2024
- Continue to integrate new dry decontamination into a mitt form factor and determine science and technology challenges within process and procedure improvements. This includes investigation of FDA requirements for approval of technology as a medical device. FY 2024 Plans: - Generate efficacy and safety data against representative traditional and nontraditional agents required to submit a medical device package for FDA consideration for skin decontaminants. FY 2023 to FY 2024 Increase/Decrease Statement: Increase due to accelerated development effort.			
Accomplishments/Planned Programs Subtotals	-	73.321	66.371

C. Other Program Funding Summary (\$ in Millions)											
<u>Line Item</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u> <u>Base</u>	<u>FY 2024</u> <u>OCO</u>	<u>FY 2024</u> <u>Total</u>	<u>FY 2025</u>	<u>FY 2026</u>	<u>FY 2027</u>	<u>FY 2028</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
• MT3: <i>Mitigate (ATD)</i>	-	86.157	100.791	-	100.791	89.511	91.704	85.795	85.480	Continuing	Continuing

Remarks

D. Acquisition Strategy

N/A

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Chemical and Biological Defense Program										Date: March 2023		
Appropriation/Budget Activity 0400 / 2					R-1 Program Element (Number/Name) PE 0602384BP / <i>Chemical and Biological Defense Program</i>			Project (Number/Name) CB2 / <i>Chemical Biological Defense (Applied Research)</i>				
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
CB2: <i>Chemical Biological Defense (Applied Research)</i>	-	97.410	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	97.410

A. Mission Description and Budget Item Justification

Project CB2 provides physical science applied research to develop future, multi-disciplinary, and multi-functional capabilities in life sciences, physical sciences, environmental sciences, mathematics, cognitive sciences, and engineering. Efforts in this project support the seamless integration of state-of-the-art-technologies into a collection of systems across the spectrum of capabilities required to support chemical and biological defense missions. After FY 2022, the Chemical Biological Defense Program (CBDP) RDT&E Projects were restructured to align with the CBDP portfolio construct. CB2 efforts in FY 2022 progress to Projects MT2, PT2, and UN2. This restructuring provides standardization and alignment across CBDP research, development and acquisition efforts.

Individual efforts in this Project include:

- Protection and hazard mitigation focuses on providing technologies that protect from and reduce the impact of chemical/biological threat or hazard to the Warfighter, weapons platforms, and structures.
- Detection focuses on developing technologies for remote and point detection and identification of chemical and biological agents.
- Decision analysis and management focuses on advanced hazard prediction, medical and epidemiological modeling of biological agents, operational effects and risk assessment, and systems performance modeling.
- Warning and reporting focuses on methods of alerting to chemical or biological threat agent releases and exposures.
- Threat agent science is devoted to characterizing threat agents and the hazards they present in terms of agent fate in the environment, toxicology, and pathogenicity, and focuses on the horizontal integration of threat agent information across CB defensive technologies in support of the Joint Services.

B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2022	FY 2023	FY 2024
Title: 1) Unattended Perimeter Monitoring	4.114	-	-
Description: Develop automated technologies to improve detection of aerosolized hazards while minimizing or removing user intervention to enable a reliable detect-to-warn capability, providing a capability for unattended monitoring of perimeters for temporary defense positioning, including base camps, to enable early indication of threats. This thrust area will evaluate current and novel technologies to provide improved chemical threat detection and automated biological detection capabilities.			
Title: 2) Unconventional Detection Modalities	3.997	-	-
Description: Develop disruptive technologies to identify unknown or emerging threats and develop sensors that can operate in complex threat environments with high fidelity. This thrust area supports others as appropriate to the Joint Force mission needs (e.g., expeditionary, perimeter defense, or unmanned reconnaissance).			

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Chemical and Biological Defense Program		Date: March 2023
Appropriation/Budget Activity 0400 / 2	R-1 Program Element (Number/Name) PE 0602384BP / <i>Chemical and Biological Defense Program</i>	Project (Number/Name) CB2 / <i>Chemical Biological Defense (Applied Research)</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2022	FY 2023	FY 2024
<p>Title: 3) Distributed CB Reconnaissance</p> <p>Description: Develop threat sensing and sampling payloads for manned and unmanned aerial system (UAS) and ground (UGS) platforms to enhance early warning and situational awareness of biological and chemical threats. Sensor development will support dismounted reconnaissance and surveillance missions by providing low size, weight, power and cost sensors or sensing/ collection systems that are rugged, rapid and accurate.</p>	3.328	-	-
<p>Title: 4) Enhanced/Emerging Biothreat Sensing</p> <p>Description: Establish a capability responsive to detecting emerging and enhanced biological threats across all force echelons (presumptive, field confirmatory, theater validation, and definitive identification) through a pathogen-agnostic laboratory workflow coupled with advanced computational tools that produce a field ready test. field forward detection capabilities to detect emerging and enhanced biological threats across all force echelons. Further, advanced biological measurement approaches and data processing sciences to understand if a biological sample presents threat characteristics that could harm the warfighter. Leveraged modern laboratory capabilities and synthetic biology methods to deliver enhance biothreat sensing capabilities to the Joint Force.</p>	7.825	-	-
<p>Title: 5) Expeditionary Analytical Toolkit (ExAnT)</p> <p>Description: Provide general and specialized forces with the ability to modernize detection technologies for traditional threats while enhancing detection capabilities for non-traditional, emerging, and mixed chemical hazards.</p>	2.903	-	-
<p>Title: 6) Air Purification Enhancements</p> <p>Description: This effort supports the Expeditionary Collective Protection (CP). Existing CP systems have high life cycle costs driven by maintenance and limited service life. Efforts will focus on optimizing and extending filter life to reduce lifecycle costs while maintaining or improving protection.</p>	0.393	-	-
<p>Title: 7) All-Hazards & Respiratory Protection</p> <p>Description: This effort supports the Respiratory and Ocular Protection. Efforts will improve chemical and biological agent protection while maintaining warfighter capability through integrated research on respirator, seams, closures, and new materials; perform early surveys for end-user jury input; frequent user operational evaluation; focus on closed circuit full spectrum respiratory protection.</p>	1.380	-	-
<p>Title: 8) Dynamic Multifunction Materials for Second Skin</p>	1.839	-	-

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Chemical and Biological Defense Program		Date: March 2023
Appropriation/Budget Activity 0400 / 2	R-1 Program Element (Number/Name) PE 0602384BP / <i>Chemical and Biological Defense Program</i>	Project (Number/Name) CB2 / <i>Chemical Biological Defense (Applied Research)</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2022	FY 2023	FY 2024
<p>Description: This effort supports the Percutaneous Protection. Efforts will utilize responsive technologies to provide chemical biological protective suits that adapt to the environment by synthesizing scaled samples via roll-to-roll manufacture which exhibit materials properties that reduce thermal burden and integrate with current combat garments. These technologies include interpenetrating polymer networks that will change moisture permeability and molecular selectivity on demand, and membranes with higher moisture vapor transfer rates than existing fabrics.</p>			
<p>Title: 9) Enhanced Survivability Coatings</p> <p>Description: This effort supports the Materiel Contamination Mitigation. Military equipment coatings are challenging and logistically intensive to decontaminate. Efforts within this thrust seek to produce enhanced coatings that increase chemical warfare agent survivability and decontaminability of military equipment to levels comparable to that of stainless steel. Improved coatings will resist chemical agent absorption and be quickly decontaminated in field, to rapidly return equipment to mission operations level.</p>	2.436	-	-
<p>Title: 10) Equipment Decontamination</p> <p>Description: This effort supports the Materiel Contamination Mitigation. The Warfighter has a limited capability to decontaminate personal equipment, weapons, vehicles, ships, and facilities; Sensitive equipment (weapon system optics, electronic equipment, interior spaces, and aircraft); and hazardous waste. Efforts within this thrust seek to develop decontaminant formulations and procedures that reduce or eliminate residual contamination hazards; enable unit-level decontamination with rapid unmasking; reduce logistic needs (need for water); enable rapid sorting of clean from dirty to rapidly return high-value equipment to normal use; and develop improved realistic test methods.</p>	2.523	-	-
<p>Title: 11) Multifunctional Materials for Protection</p> <p>Description: This effort supports the Respiratory and Ocular Protection, Percutaneous Protection, Expeditionary Collective Protection, Materiel Contamination Mitigation, and Personnel Contamination Mitigation. Efforts will discover, develop and integrate novel, reactive/catalytic materials and scale material manufacturing with maximum sorption and reactivity, and characterize materials using state-of-the-art in operando and ambient pressure spectroscopies, for eventual integration into next generation decontaminants, coatings, filters, and protective garments that reactively decontaminate chemical warfare agents.</p>	4.677	-	-
<p>Title: 12) Personnel Decontamination</p> <p>Description: This effort supports the Personnel Contamination Mitigation. Efforts will develop decontaminants for decontamination of unbroken skin with lower lifecycle costs and storage constraints and determination of time, efficacy and logistics burdens to warfighters for mass casualty decontamination. Decrease Warfighter burden in the event of a Chemical</p>	1.180	-	-

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Chemical and Biological Defense Program		Date: March 2023
Appropriation/Budget Activity 0400 / 2	R-1 Program Element (Number/Name) PE 0602384BP / <i>Chemical and Biological Defense Program</i>	Project (Number/Name) CB2 / <i>Chemical Biological Defense (Applied Research)</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2022	FY 2023	FY 2024
Warfare Agent (CWA) exposure by identifying science and technology gaps in the mass personnel decontamination process as well as possible substitutions for current approved personnel decontamination formulations.			
<p>Title: 13) Employment Characterization</p> <p>Description: Employment Characterization studies refine threat assessments and identify potential impacts of indoor and/or outdoor releases of threat agents on CBDP operations, strategy, and capabilities. These studies directly define the Warfighter threat space by determining how chemical and biological agents behave when released. This thrust area reduces risk to the CBDP Enterprise by closing knowledge gaps and informing on the type, extent and magnitude of a potential hazard a warfighter may face in an operational environment.</p> <p>Employment Characterization will: review state of knowledge on agent employment (laboratory and outdoors) to identify gaps and threat agent science (TAS) assessment opportunities; continue coordination with international partners to leverage skills and resources; develop closer linkages to hazard prediction modelers to identify knowledge gaps and TAS opportunities; prepare evaluation of potential munitions for applicability to potential future threats based on performance characteristics; and continue chamber tests and operational trials as appropriate for compounds of interest.</p>	4.159	-	-
<p>Title: 14) Environmental Response</p> <p>Description: Environmental Response evaluates CB threats to understand how they will behave in the environment (e.g. persistence, degradation, decomposition), along with the effects of environmental conditions (e.g. ozone, UV, humidity, etc.) on those agents. Studies include evaluations of chemical and biological threat agents on soil, water, and plants, and operational surfaces such as clothing, structures, and equipment. This thrust area reduces risk to the CBDP Enterprise by closing knowledge gaps and informing on the type, extent and magnitude of a potential hazard a warfighter may face in an operational environment. Small-scale laboratory measurements are used to predict the larger-scale behavior and fate of the agents in outdoor and operational settings, while examining agents deposited on operationally relevant substrates refines our understanding of their environmental persistence and hazards. Knowledge obtained from Environmental Response is used to inform operators, predictive model development, and capability development.</p>	6.467	-	-
<p>Title: 15) First Look (Chemical and Biological)</p> <p>Description: First Look provides the initial evaluation of known and emerging threat agents to determine their potential hazard to the Warfighter. For both chemical and biological agents, this initial fundamental risk assessment includes evaluation of synthesis and toxicity screening for chemicals and toxins and growth and/or virulence for biological agents as well as production and feasibility of weaponization for all agents.</p> <p>Investments in this area are used to evaluate threat agents as well as develop methods and capabilities to quickly and accurately characterize chemical, biological, and toxin threat agent properties. First Look products/data inform warfighter mission planning,</p>	9.850	-	-

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Chemical and Biological Defense Program		Date: March 2023		
Appropriation/Budget Activity 0400 / 2	R-1 Program Element (Number/Name) PE 0602384BP / <i>Chemical and Biological Defense Program</i>	Project (Number/Name) CB2 / <i>Chemical Biological Defense (Applied Research)</i>		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2022	FY 2023	FY 2024
requirements generation, capability development, model development, the larger CBDP Enterprise, Intelligence and other government stakeholders about known or emerging agent threats.				
<p>Title: 16) Host Response</p> <p>Description: Host Response assesses the human response of exposure to biological and chemical threat agents using operationally relevant exposure scenarios (acute versus chronic) and exposure routes (e.g., .inhalation, dermal, ingestion, etc.) and appropriate assessment methods and models. Data from host response studies are used to develop quantitative exposure limits (e.g. LD50 or ID50) and qualitative information (e.g. mechanism of action) to inform warfighter mission planning, requirements generation, capability development, model development, the larger CBDP Enterprise, Intelligence and other government stakeholders.</p> <p>The program, known as CRISTAL (Computational Rapid Identification and Scientific Threat Analysis) is modernizing to include predictive capabilities for rapidly assessing the human response to chemical and biological threat agents. In addition, host response will be working to close known knowledge gaps associated with traditional threats, including exploring synergistic effects associated with combinatorial agent exposures. Bioavailability of threats that are encapsulated to understand host response differences between exposures to encapsulated versus un-encapsulated threats will be also be assessed.</p>		15.199	-	-
<p>Title: 17) Technical Surprise</p> <p>Description: Technical Surprise assesses technological advancements for potential implications to the threat space, including agent use and release. Technical Surprise includes horizon scanning to identify potential areas of concern as well as conducts technical assessments of emerging technological advancements (e.g. biotechnology, artificial intelligence, machine learning, quantum computing). This program develops capabilities to evaluate and assess technical enhancements that may alter the nature or magnitude of a threat agent.</p> <p>The technical surprise program will be evaluating emerging technologies and convergence of technologies that improve the ease of threat use and make threats more likely to survive being released. Identify the limitations and barriers associated with synthetic biology and assess the implications. These efforts will identify and assess former technology hurdles that have been lowered or overcome and assess implications of increasing potential threat.</p>		4.500	-	-
<p>Title: 18) CBRN Battlespace Surveillance, Alerting & Response</p> <p>Description: Improve the Department of Defense's capability to detect, identify, alert, and responds to deliberate releases and naturally occurring outbreaks of chemical and biological threat agents. Current predictive algorithms in development by JSTO are based on large in-hospital datasets from patients with comorbidities. Improving on the applicability and efficacy of these algorithms will focus on large, real-time human data collects of chemical and biological agent / agent proxy exposures. Additionally, studies will focus on examining the feasibility of specifically isolating indicators of respiratory infection, determining</p>		9.459	-	-

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Chemical and Biological Defense Program		Date: March 2023
Appropriation/Budget Activity 0400 / 2	R-1 Program Element (Number/Name) PE 0602384BP / <i>Chemical and Biological Defense Program</i>	Project (Number/Name) CB2 / <i>Chemical Biological Defense (Applied Research)</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2022	FY 2023	FY 2024
severity of infection, and predicting return to mission readiness after exposure. This capability will enable early implementation of countermeasures such as isolation, quarantine, and removal from an area, thus potentially reducing transmission, morbidity, and mortality rates. The maturation of algorithms will incorporate Machine Learning (ML) approaches for refining sensitivity and specificity.			
<p>Title: 19) CBRN Decision Aids</p> <p>Description: In order to unencumber the warfighter at the tactical edge, continue to develop and field CBRN Decision Aids on End User Devices (EUDs) in both connected and disconnected operations. Capabilities will focus on utilizing automation, reducing the burden experienced by the warfighter, while providing accurate, actionable information. During this time period, a focus will be put on developing a Contamination Avoidance Decision Aid to inform the warfighter on how to avoid, respond to and plan routes around CB hazards.</p> <p>Another area of focus will be the development of Autonomous Asset Guidance. This capability will be used in conjunction with other capabilities developed under the CBRN Decision Aids portfolio to optimize the use of Autonomous Assets and reduce the burden incurred by the warfighter in order to operate them. This capability will also aim to incorporate, fuse and utilize data from Autonomous Assets to improve and refine other CBRN Decision Aids.</p>	3.100	-	-
<p>Title: 20) CBRN Situational Awareness</p> <p>Description: To enhance CB Situational Awareness, efforts will expand the types of threats that can be modeled with hazard assessment capabilities to include fixed-wing and rotary-wing drones of interests. These capabilities will allow for single drones and swarms to be modeled.</p> <p>Virtual Reality (VR) and Augmented Reality (AR) technologies will be leveraged to develop CB focused training and mission rehearsal capabilities that will be integrated into systems widely used by the Joint Force. Virtual training environments will be developed to implement, visualize and account for hazard source terms and plumes generated by transport and dispersion (T&D) models Augmented Reality applications will also be explored for tactical use to maximize warfighter CB situational awareness on the battlefield.</p> <p>Modernize hazard modeling capabilities by adopting a modular framework and integrating across Service command and control systems to operationalize Reachback support. Further enhance hazard modeling by creating a seamless indoor-to-outdoor T&D modeling capability and improve urban T&D modeling to support operations in urban and mixed environments. New state-of-the-art computational fluid dynamics modeling techniques and their exploitation of the latest computing resources will be leveraged to increase both speed and accuracy.</p>	8.081	-	-

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Chemical and Biological Defense Program		Date: March 2023
Appropriation/Budget Activity 0400 / 2	R-1 Program Element (Number/Name) PE 0602384BP / <i>Chemical and Biological Defense Program</i>	Project (Number/Name) CB2 / <i>Chemical Biological Defense (Applied Research)</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2022	FY 2023	FY 2024
Develop CB health effect modeling software and analytic tools to support force readiness and facilitate medical planning against chemical and biological agents. Epidemiological models will be developed that quantify and visualize mission operational impacts from exposure to, and spread of, infectious biological threat agents to DoD relevant populations. Additionally, efforts will leverage Threat Agent Science (TAS) data to enhance capabilities for modeling health effects and host pathogen interactions from exposures to traditional and non-traditional CB agents. This will provide the warfighter with more accurate casualty estimates accounting for human health effects.			
Accomplishments/Planned Programs Subtotals	97.410	-	-

C. Other Program Funding Summary (\$ in Millions)											
Line Item	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
• CB3: <i>Chemical Biological Defense (ATD)</i>	28.484	-	-	-	-	-	-	-	-	0.000	28.484
• MT3: <i>Mitigate (ATD)</i>	-	86.157	100.791	-	100.791	89.511	91.704	85.795	85.480	Continuing	Continuing
• PT3: <i>Protect (ATD)</i>	-	32.113	29.261	-	29.261	48.969	42.794	46.159	52.581	Continuing	Continuing
• UN3: <i>Understand (ATD)</i>	-	68.415	83.825	-	83.825	81.392	87.384	73.515	71.015	Continuing	Continuing

Remarks

D. Acquisition Strategy

N/A

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Chemical and Biological Defense Program										Date: March 2023		
Appropriation/Budget Activity 0400 / 2					R-1 Program Element (Number/Name) PE 0602384BP / <i>Chemical and Biological Defense Program</i>				Project (Number/Name) TM2 / <i>Techbase Medical Defense (Applied Research)</i>			
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
TM2: <i>Techbase Medical Defense (Applied Research)</i>	-	107.608	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	107.608

A. Mission Description and Budget Item Justification

Project TM2 provides for applied research for innovative technology approaches to advance medical systems designed to rapidly identify, diagnose, prevent, and treat disease due to exposure to chemical and biological threat agents. After FY 2022, the Chemical Biological Defense Program (CBDP) RDT&E Projects were restructured to align with the CBDP portfolio construct. TM2 efforts in FY 2022 progress to Projects MT2, PT2, and UN2. This restructuring provides standardization and alignment across CBDP research, development and acquisition efforts.

Individual efforts in this Project include:

- Core science efforts in Medical Chemical, Medical Biological, Diagnostics, and Medical Countermeasures.
- Supports applied research for the investigation of new medical countermeasures to include prophylaxes, pretreatments, antidotes, skin decontaminants, and therapeutic drugs against identified and emerging biological and chemical warfare agents.
- Medical Science and Technology (S&T) efforts in this Budget Activity refine promising medical initiatives identified in Budget Activity 1, resulting in the development of countermeasures to protect against and treat the effects of exposure to chemical and biological (CB) agents.
- Diagnostic research focuses on providing high quality data closer to the point-of-need comprising device innovation, panels of biomarkers driven by bioinformatics, and epidemiological modeling tools.

B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2022	FY 2023	FY 2024
Title: 1) Chemical Diagnostics	0.699	-	-
Description: Provide innovative and integrated capabilities to the Warfighter that are able to diagnose threats across the chemical spectrum. Enhance force protection by investing in diagnostics for exposure to traditional and nontraditional Chemical Warfare Agents (CWAs), including pharmaceutical based agents (PBAs). Leverage the development of a chemical diagnostic that monitors blood, indicating whether a Warfighter has been exposed to nerve agents within minutes.			
Title: 2) Diagnostic Building Blocks	4.446	-	-
Description: Develop novel, state of the art capabilities that lay the foundation for modernizing other areas within the diagnostics portfolio. This includes exploiting areas such as synthetic biology and chemistry to develop novel and rapid diagnostic tests for utilization in the event of an outbreak of an unknown threat. Invest in efforts that lead to accelerated assay development timelines and optimized test parameters through leveraging artificial intelligence (AI) and machine learning (ML) to allow us to quickly pivot and develop assays for emerging threats and speed up development to days instead of weeks.			

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Chemical and Biological Defense Program		Date: March 2023
Appropriation/Budget Activity 0400 / 2	R-1 Program Element (Number/Name) PE 0602384BP / <i>Chemical and Biological Defense Program</i>	Project (Number/Name) TM2 / <i>Techbase Medical Defense (Applied Research)</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2022	FY 2023	FY 2024
<p>Title: 3) Emerging Threats</p> <p>Description: Push beyond the boundaries of the traditional threat list in the field of diagnostics to better prepare for surprise. Development of diagnostic systems that leverage novel approaches to characterize pathogen or host response and can identify the classification of threat (e.g., bacterial vs viral) from an unknown sample. Invest in diagnostic tests that enable the delivery of actionable information, such as administering the appropriate medical countermeasure (e.g. antibiotic, antiviral, vaccine), by a medic or primary care provider greatly improves turnaround time for soldier wellness and return to duty.</p>	4.110	-	-
<p>Title: 4) Bacterial Therapeutics</p> <p>Description: Discover and develop therapeutic countermeasures to mitigate the effects of known and emerging bacterial threats to the warfighter.</p>	14.456	-	-
<p>Title: 5) Toxin Therapeutics</p> <p>Description: Discover and develop therapeutic countermeasures to protect the warfighter against biotoxin threats.</p>	0.250	-	-
<p>Title: 6) Viral Therapeutics</p> <p>Description: Discover and develop therapeutic countermeasures to mitigate the effects of known and emerging viral threats to the warfighter.</p>	14.457	-	-
<p>Title: 7) Bacterial/Viral/Toxins/Broad Spectrum Prophylaxis</p> <p>Description: The ultimate protection of the Warfighter is achieved by pretreating the Warfighter to withstand any biological threat with no adverse side effects from the pretreatment. Such pretreatment would enable the Warfighter to work in a less restrictive environment, absent of any personal protective equipment, facilitating the Warfighter to operate at peak performance. Investments in this Program Element support innovative concepts in prophylaxis that support needs specific to the warfighter such as broad spectrum protection, rapid onset to protection, fewer doses required, no cold chain required, and needle-free administration.</p>	35.512	-	-
<p>Title: 8) Chemical Reactive Ocular Wound and Dermal Therapeutics (CROWD)</p> <p>Description: Focuses on therapeutic strategies to effectively treat CWA contamination on wounds, eyes, and large areas of intact skin. This effort involves the development of products capable of removing or neutralizing CWAs from those routes of exposure, to decrease the toxic load of agent and allow optimal effectiveness of other systemic therapeutics.</p>	6.679	-	-
<p>Title: 9) Enabling Science</p>	10.214	-	-

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Chemical and Biological Defense Program		Date: March 2023
Appropriation/Budget Activity 0400 / 2	R-1 Program Element (Number/Name) PE 0602384BP / <i>Chemical and Biological Defense Program</i>	Project (Number/Name) TM2 / <i>Techbase Medical Defense (Applied Research)</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2022	FY 2023	FY 2024
<p>Description: Protection of the Warfighter against Chemical Warfare Agents (CWAs) to maintain force lethality is the ultimate goal of the Enabling Sciences portfolio. The portfolio leverages innovative approaches and emerging technologies to support modernization of chemical medical countermeasure (cMCM) pipeline. The portfolio is designed to develop and deploy cMCMs more rapidly to the warfighter.</p> <p>Portfolio elements include: 1) development of Artificial Intelligence/Machine Learning (AI/ML) tools to more efficiently identify cMCMs and assess their safety and efficacy for regulatory submission; 2) AI/ultra-high throughput screening-based sampling of large chemical spaces with the aim of providing broad spectrum cMCMs with improved efficacy and selectivity, minimal toxicity, and decreased expense and fielding times to the warfighter; 3) development of technologies to deliver MCMs across the blood brain barrier (BBB) into the brain; 4) maturation of cMCMs with innovative mechanisms of actions; and 5) development of well characterized or FDA qualified animal models, as needed, to support cMCM discovery and development under the FDA animal rule.</p>			
<p>Title: 10) Nerve Agent Prophylaxis/Pretreatments</p> <p>Description: Develop pretreatments and prophylactics that counter chemical warfare agents, including organophosphorus nerve agents (OPNA), using targeted and innovative science & technology efforts that will offer broad-spectrum protection, flexible route of administration, lower dose requirements, and reduced operational and logistical burden. The use of these MCMs will protect the lives and effectiveness of our warfighters, thus maintaining force strength and force capability.</p>	3.282	-	-
<p>Title: 11) Pharmaceutical Based Agents (PBAs)</p> <p>Description: Focuses on therapeutic strategies to effectively minimize injuries resulting from exposure to Pharmaceutical Based Agents (PBAs). This effort involves the evaluation FDA approved therapeutics for operational use, as well as generation of novel drug products to enhance level of protection and/or operational utility for the Warfighter. Efforts in this area are designed to develop drug candidates that will ultimately be submitted for Food and Drug Administration (FDA) licensure or to identify previously licensed products for new uses in the treatment of chemical warfare casualties.</p>	6.673	-	-
<p>Title: 12) Reactivators of AChE as Therapeutics (ReACT)</p> <p>Description: The warfighter requires rapid acting medical countermeasures (MCMs) to counter adverse effects from exposure to Nerve Agents (NAs) and maintain force lethality. This effort involves the development of improved therapies for acetylcholinesterase enzyme reactivation. Efforts in this area are designed to develop potential candidates that will ultimately be submitted for U.S. Food and Drug Administration (FDA) licensure or to identify previously licensed products for new uses in the treatment of chemical warfare casualties.</p>	3.830	-	-

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Chemical and Biological Defense Program		Date: March 2023
Appropriation/Budget Activity 0400 / 2	R-1 Program Element (Number/Name) PE 0602384BP / <i>Chemical and Biological Defense Program</i>	Project (Number/Name) TM2 / <i>Techbase Medical Defense (Applied Research)</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2022	FY 2023	FY 2024
Accomplishments/Planned Programs Subtotals	104.608	-	-

	FY 2022	FY 2023
Congressional Add: Biological Warfare Defense Therapeutics	3.000	-
FY 2022 Accomplishments: For PUL 042 (Burkholderia, Tularemia), a clinical stage inhaled therapeutic proof of concept small animal efficacy studies will be completed with options for non human primate pharmacokinetics studies, and Good Manufacturing Practice (GMP) manufacturing. The candidate will then be ready to transition to advanced development. This is a host directed therapeutic and fits with our broad spectrum strategy for MCMs. - Continue non-clinical animal immunogenicity and efficacy studies for a Tularemia subunit.		
Congressional Adds Subtotals	3.000	-

C. Other Program Funding Summary (\$ in Millions)

Line Item	FY 2022	FY 2023	FY 2024	FY 2024	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028	Cost To	
			Base	OCO	Total					Complete	Total Cost
• EN3: <i>Enabling Investments (ATD)</i>	-	39.540	43.196	-	43.196	43.198	44.449	44.449	44.449	Continuing	Continuing
• MT2: <i>Mitigate (Applied Research)</i>	-	73.321	66.371	-	66.371	63.832	51.426	59.920	64.824	Continuing	Continuing
• MT3: <i>Mitigate (ATD)</i>	-	86.157	100.791	-	100.791	89.511	91.704	85.795	85.480	Continuing	Continuing
• PT2: <i>Protect (Applied Research)</i>	-	58.091	55.057	-	55.057	56.153	57.817	61.452	61.452	Continuing	Continuing
• PT3: <i>Protect (ATD)</i>	-	32.113	29.261	-	29.261	48.969	42.794	46.159	52.581	Continuing	Continuing
• TM3: <i>Techbase Medical Defense (ATD)</i>	144.779	-	-	-	-	-	-	-	-	0.000	144.779
• UN2: <i>Understand (Applied Research)</i>	-	112.952	119.182	-	119.182	111.773	107.842	107.193	107.193	Continuing	Continuing
• UN3: <i>Understand (ATD)</i>	-	68.415	83.825	-	83.825	81.392	87.384	73.515	71.015	Continuing	Continuing

Remarks

D. Acquisition Strategy

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Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Chemical and Biological Defense Program **Date:** March 2023

Appropriation/Budget Activity 0400: <i>Research, Development, Test & Evaluation, Defense-Wide I BA 3: Advanced Technology Development (ATD)</i>	R-1 Program Element (Number/Name) PE 0603384BP / <i>Chemical and Biological Defense Program - Advanced Development</i>
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COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
Total Program Element	0.000	191.695	226.225	267.073	0.000	267.073	273.070	276.331	259.918	263.525	Continuing	Continuing
UN3: <i>Understand (ATD)</i>	-	0.000	68.415	83.825	0.000	83.825	81.392	87.384	73.515	71.015	Continuing	Continuing
PT3: <i>Protect (ATD)</i>	-	0.000	32.113	29.261	0.000	29.261	48.969	42.794	46.159	52.581	Continuing	Continuing
MT3: <i>Mitigate (ATD)</i>	-	0.000	86.157	100.791	0.000	100.791	89.511	91.704	85.795	85.480	Continuing	Continuing
EN3: <i>Enabling Investments (ATD)</i>	-	0.000	39.540	43.196	0.000	43.196	43.198	44.449	44.449	44.449	Continuing	Continuing
ET3: <i>Emerging Threats (ATD)</i>	-	0.000	0.000	10.000	0.000	10.000	10.000	10.000	10.000	10.000	Continuing	Continuing
CB3: <i>Chemical Biological Defense (ATD)</i>	-	28.484	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	28.484
NT3: <i>Non-Traditional Agents Defense (ATD)</i>	-	10.843	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	10.843
TM3: <i>Techbase Medical Defense (ATD)</i>	-	144.779	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	144.779
TT3: <i>Technology Transition (ATD)</i>	-	7.589	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	7.589

A. Mission Description and Budget Item Justification

This program element (PE) resources Advanced Technology Development across the Understand, Protect, Mitigate, and Enabling Investments portfolios. Chemical and Biological Defense Program (CBDP) investments provide an integrated, layered capability to enable Countering Weapons of Mass Destruction (CWMD) missions ranging from combat operations to Department of Defense (DoD) support to domestic incident prevention and response. The Projects in this PE demonstrate technologies supporting the transition to advanced component development for physical capabilities, which cover chemical and biological (CB) detection, situational awareness and effects modeling, and protection and hazard mitigation. FY24 funding accelerates characterization and situational awareness of emerging biothreats and accelerates delivery of improved protection from and mitigation of biothreats, including rapid repurposing of available therapeutics and development of new vaccines.

Individual Projects include:

- Understand (UN3): Demonstration of enhanced chemical detection capabilities for aerosols and non-traditional agents, expanded capabilities for biosurveillance in pathogen detection and diagnosis, produce biological diagnostic arrays and reagents and diagnostic device platforms.
- Protect (PT3): Production of pretreatment candidates for bacterial, viral, and toxin threats.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Chemical and Biological Defense Program	Date: March 2023
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Appropriation/Budget Activity 0400: <i>Research, Development, Test & Evaluation, Defense-Wide I BA 3: Advanced Technology Development (ATD)</i>	R-1 Program Element (Number/Name) PE 0603384BP / <i>Chemical and Biological Defense Program - Advanced Development</i>
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- Mitigate (MT3): Production of therapeutic candidates for bacterial, viral, and toxin threats.
- Enabling Investments (EN3): Demonstrations of CB defense technologies, including biological detection, chemical detection, and decontamination, including non-traditional agents. Continued efforts to enhance the military operational capability, concepts of operation, and WMD elimination.
- Emerging Threats (ET3): identify and develop scientific solutions or to modernize capabilities that allow for a more rapid response to emerging threats.
- Chemical Biological Defense (CB3), Non-Traditional Agents (NTA) Defense (NT3), Techbase Medical Defense (TM3), and Technology Transition (TT3) are no longer active FY24 Projects due to budget restructuring.

CBDP Science and Technology (S&T) Applied Research Performers: U.S. Army Combat Capabilities Development Command Chemical Biological Center (DEVCOM CBC), United States Army Medical Research Institute of Infectious Diseases (USAMRIID), United States Army Medical Research Institute of Chemical Defense (USAMRICD), United States Army Natick Soldier Systems Center, Naval Research Lab (NRL), Air Force Research Lab (AFRL), and Department of Energy Laboratories such as Pacific Northwest National Laboratory (PNNL), among others. The intent is to maintain strategic partnerships with the DoD Service communities & the interagency for mission success across the enterprise through collaborative planning and programming maintaining budget assurance.

Work conducted under this PE will transition to and will provide risk reduction for Advanced Component Development and Prototypes (PE 0603884BP) and System Development and Demonstration (PE 0604384BP) activities.

B. Program Change Summary (\$ in Millions)	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Previous President's Budget	197.824	238.407	248.071	-	248.071
Current President's Budget	191.695	226.225	267.073	-	267.073
Total Adjustments	-6.129	-12.182	19.002	-	19.002
• Congressional General Reductions	-	-0.182			
• Congressional Directed Reductions	-	-17.000			
• Congressional Rescissions	-	-			
• Congressional Adds	-	5.000			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-3.365	-			
• SBIR/STTR Transfer	-2.764	-			
• Other Adjustments	-	-	19.002	-	19.002

Congressional Add Details (\$ in Millions, and Includes General Reductions)

Project: MT3: *Mitigate (ATD)*

FY 2022	FY 2023

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Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Chemical and Biological Defense Program **Date:** March 2023

Appropriation/Budget Activity 0400: <i>Research, Development, Test & Evaluation, Defense-Wide I BA 3: Advanced Technology Development (ATD)</i>	R-1 Program Element (Number/Name) PE 0603384BP / <i>Chemical and Biological Defense Program - Advanced Development</i>
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Congressional Add Details (\$ in Millions, and Includes General Reductions)

Congressional Add: *Broad Spectrum Small Molecule Anti-viral Development*

Congressional Add Subtotals for Project: MT3

Congressional Add Totals for all Projects

	FY 2022	FY 2023
	-	5.000
Congressional Add Subtotals for Project: MT3	-	5.000
Congressional Add Totals for all Projects	-	5.000

Change Summary Explanation

Funding: FY 2022 (-\$3.365 Million): Below threshold reprogramming to support Advanced Emerging Threat Defense efforts in Advanced Component Development & Prototypes, Budget Activity 4, and reprogrammed prior year execution balances to RDT&E Management Support, Budget Activity 6 in support of the Departments higher priorities.

FY 2022 (-\$2.764 Million): Transfer of funding to support Small Business Innovative Research/Small Business Technology Transfer efforts.

FY 2023 (-\$0.182 Million): Congressional General Reductions to support Federally Funded Research and Development Centers (FFRDCs).

FY 2023 (-\$17.000 Million): Congressional Directed Reductions.

FY 2023 (+\$5.000 Million): Congressional Add for broad spectrum small molecule anti-viral development.

FY 2024 (+\$19.002 Million): Increase for Chemical Warfare Defense Prophylaxis and Therapeutics and CBRN Warning and Decision Support efforts (+\$12.033 Million), to expand early warning through wastewater surveillance capabilities (+\$5.700 Million), and Departmental inflation rate adjustments (+\$1.269 Million).

Schedule: N/A

Technical: N/A

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Chemical and Biological Defense Program **Date:** March 2023

Appropriation/Budget Activity 0400 / 3	R-1 Program Element (Number/Name) PE 0603384BP / <i>Chemical and Biological Defense Program - Advanced Development</i>	Project (Number/Name) UN3 / <i>Understand (ATD)</i>
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COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
UN3: <i>Understand (ATD)</i>	-	0.000	68.415	83.825	0.000	83.825	81.392	87.384	73.515	71.015	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Understand Advanced Technology Development (ATD) Project supports freedom of maneuver and informs commanders' decisions by predicting, locating, identifying, analyzing, and warning of chemical and biological (CB) hazards. In FY 2023, the Chemical Biological Defense Program (CBDP) RDT&E Projects were restructured to align with the CBDP portfolio construct. UN3 efforts in FY 2022 remain in Projects CB3, NT3, and TM3. This restructuring provided standardization and alignment across CBDP research, development and acquisition efforts.

Thrust Areas included in this Project are:

- (1) Chemical, Biological, Radiological, and Nuclear (CBRN) Battlespace Sensing, Alerting & Response
- (2) CBRN Decision Aids
- (3) CBRN Situational Awareness
- (4) Battlefield Readiness
- (5) Chemical Diagnostics
- (6) Clinical Evaluation
- (7) Diagnostic Building Blocks
- (8) Emerging Threats
- (9) Emerging and Enhanced Biothreat Sensing
- (10) Distributed CB Reconnaissance
- (11) Expeditionary Analytical Toolkit (ExAnT)
- (12) Unconventional Detection Modalities
- (13) Technical Surprise
- (14) Unattended Perimeter Monitoring

CBRN Battlespace Sensing, Alerting & Response: Development of algorithms that generate and disseminate warning to personnel in time to prevent exposure to or limit the impact of CBRN threats. This thrust area conducts data collection trials to support algorithm development; leverage Artificial Intelligence (AI) to identify key indicators, combinations of indicators, and sensing modalities to reduce false alarms and predict the likelihood of exposure; explore remote and contactless monitoring and analysis for application in Warfighter chemical and biological threat exposure alerting. Efforts include additional investments in enhanced biodefense and pandemic preparedness.

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Chemical and Biological Defense Program	Date: March 2023
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Appropriation/Budget Activity 0400 / 3	R-1 Program Element (Number/Name) PE 0603384BP / <i>Chemical and Biological Defense Program - Advanced Development</i>	Project (Number/Name) UN3 / <i>Understand (ATD)</i>
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CBRN Decision Aids: Providing tools that assess risk from CBRN hazards and identify courses of action to limit impact. This thrust area permits connectivity, enabling the dynamic discovery, querying, and control of sensors through standard protocols; allow for dynamic discovery and integration between networked devices at the tactical edge to enable sharing of information and capabilities across connected components. Efforts include additional investments in enhanced biodefense and pandemic preparedness.

CBRN Situation Awareness: Providing operationally relevant context to CB-specific phenomena data to ensure the Joint Force is able to characterize new CB hazards and mitigate their effects on mission success. This thrust area provides the analytic framework to determine optimal defense postures by extrapolating scientific data generated during the course of technology development and hazard assessment data into an assessment to help inform operational utility. Efforts include additional investments in enhanced biodefense and pandemic preparedness.

Battlefield Readiness: Provides innovative capabilities to the Warfighter that increase the speed of relevancy, enhance troop preparedness, aid with triage support, and provides diagnosis at lower roles of care. Develops field forward medical diagnostics to provide multiplexed detection of biological and toxin threats and leverages immunodiagnostics to identify specific targets using current or novel approaches to enable broader and more accurate diagnosis for a range of targets and across a wider window following exposure.

Chemical Diagnostics: Discovers innovative and integrated capabilities that are able to diagnose threats across the chemical spectrum and enhance force protection by investing in diagnostics for exposure to traditional and nontraditional Chemical Warfare Agents (CWA), including pharmaceutical based agents. Efforts include coordinating with Threat Agent Science and the Intelligence Community and to understand the chemical threat space.

Clinical Evaluation: Provides independent verification and validation of diagnostic tests in real world patients to decrease development costs, collecting initial clinical data sets to support pre-submission discussions with the Food and Drug Administration (FDA). De-risks diagnostic platform development through third party, real world, and austere environment testing and evaluation prior to transition and establishes clinical and performance parameters therefore de-risking diagnostic platforms through real world populations.

Diagnostic Building Blocks: Develops foundational capabilities for the entire diagnostics portfolio; invests in innovative, cutting-edge technologies to improve the development pipeline for diagnostics; and exploits areas in artificial intelligence synthetic biology and machine learning to develop novel and rapid diagnostic tests for utilization. Efforts accelerate assay development timelines and optimize test parameters by leveraging novel concepts and tools that readily allow a pivot to assay development for emerging threats.

Emerging Threats: Invests in diagnostic tests that enable the delivery of actionable information, such as administering the appropriate medical countermeasure, to greatly advance efficacy rates and turnaround time for Warfighter wellness. Efforts focus on better preparing for surprise by developing diagnostic systems that leverage novel approaches to characterize pathogens or host response and can identify the classification of threat (e.g., bacterial vs viral) from an unknown sample.

Emerging and Enhanced Biothreat Sensing: Establishes a capability to rapidly develop advanced, agile, pathogen-agnostic laboratory and field forward detection capabilities to detect emerging and enhanced biological threats across all force echelons (presumptive, field confirmatory, theater validation, and definitive identification).

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Chemical and Biological Defense Program	Date: March 2023
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Appropriation/Budget Activity 0400 / 3	R-1 Program Element (Number/Name) PE 0603384BP / <i>Chemical and Biological Defense Program - Advanced Development</i>	Project (Number/Name) UN3 / <i>Understand (ATD)</i>
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Further, multiple biological measurements will be used to modernize laboratory capabilities and leverage synthetic biology methods and tools to deliver enhanced biothreat sensing/detection capabilities to the Joint Force.

Distributed CB Reconnaissance: Enhances early warning and situational awareness of CB threats while reducing potential Warfighter exposure using distributed CB reconnaissance tools to include low-cost point sensors and sensing/collection systems for unmanned platforms. Efforts include developing threat sensing and sampling payloads for manned and unmanned aerial and ground platforms to enhance early warning and situational awareness of CB threats.

Expeditionary Analytical Toolkit (ExAnT): Provides general and specialized forces with the ability to modernize detection technologies for traditional threats while enhancing detection capabilities for non-traditional, emerging, and mixed chemical hazards.

Unconventional Detection Modalities: Develops disruptive technologies to identify unknown or emerging chemical threats and develops chemical sensors that can operate in complex threat environments with high fidelity. Efforts include utilizing machine learning and other advanced computational tools to increase detection and identification accuracy, reduce false alarms, and enable mapping of hazardous locations to support integrated early warning (IEW) capabilities.

Technical Surprise: Encompasses horizon scanning to identify potential areas of concern and conducts technical assessments of emerging technological advancements. Efforts assess technological advancements for potential implications to the threat space, including agent use and release and develops capabilities to evaluate and assess technical enhancements that may alter the nature or magnitude of a threat agent. These efforts include additional investments in Biodefense Improvement.

Unattended Perimeter Monitoring: Invests in efforts supporting Integrated Early Warning and Integrated Layered Defense by establishing a layered defense capability through developing and implementing automated and integrated technologies enabling unattended monitoring for biothreats.

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2022	FY 2023	FY 2024
<p>Title: 1) CBRN Battlespace Sensing, Alerting, and Response</p> <p>Description: Improve the Department of Defense's capability to detect, identify, alert, and responds to deliberate releases and naturally occurring outbreaks of chemical and biological threat agents. Expand on the development of predictive CB exposure algorithms based on non-invasively collected human biomarkers. Improve on the applicability and efficacy of these algorithms focusing on large, real-time human data collects of chemical and biological agent / agent proxy exposures. Studies will focus on examining the feasibility of specifically isolating indicators of respiratory infection, determining severity of infection, and predicting return to mission readiness after exposure. Enable early implementation of countermeasures such as isolation, quarantine, and removal from an area, thus potentially reducing transmission, morbidity, and mortality rates. Matured algorithms will incorporate Machine Learning (ML) approaches for refining sensitivity and specificity.</p> <p>FY 2023 Plans:</p> <ul style="list-style-type: none"> - Continue the improvement of algorithms that leverage non-invasive based physiological data to provide early warning of chemical and biological threats and/or exposure. 	-	5.171	4.500

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Chemical and Biological Defense Program		Date: March 2023		
Appropriation/Budget Activity 0400 / 3	R-1 Program Element (Number/Name) PE 0603384BP / <i>Chemical and Biological Defense Program - Advanced Development</i>	Project (Number/Name) UN3 / <i>Understand (ATD)</i>		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2022	FY 2023	FY 2024
<p>- Continue the advancement of standoff physiological monitoring capabilities.</p> <p>- Leverage a data and AI platform that supports access to harmonized physiological status monitoring data and support development and validation of models to continue to develop predictive algorithms aimed at the rapid response to Emerging Threats.</p> <p>FY 2024 Plans:</p> <p>- Continue the improvement of algorithms that leverage non-invasive based physiological data to provide early warning of chemical and biological threats and/or exposure.</p> <p>- Continue the advancement of standoff physiological monitoring capabilities.</p> <p>- Expand and further develop a data and Artificial Intelligence (AI) platform to support the access to harmonized physiological status monitoring data and development and validation of models in order to continue to develop predictive algorithms for the rapid response to Emerging Threats.</p> <p>FY 2023 to FY 2024 Increase/Decrease Statement: Minor change due to routine program adjustments.</p>				
<p>Title: 2) CBRN Decision Aids</p> <p>Description: Unencumber the warfighter at the tactical edge by continuing to development and fielding of CBRN Decision Aids on End User Devices (EUDs) in both connected and disconnected operations. Focus on utilizing automation, reducing the burden experienced by the warfighter, while providing accurate, actionable information. Develop a Contamination Avoidance Decision Aid to inform the warfighter on how to avoid, respond to and plan routes around CB hazards. Develop of Autonomous Asset Guidance for use in conjunction with other capabilities developed under the CBRN Decision Aids portfolio to optimize Autonomous Asset use and reduce the burden incurred by the warfighter in order to operate them. Incorporate, fuse and utilize data from Autonomous Assets to improve and refine other CBRN Decision Aids.</p> <p>FY 2023 Plans:</p> <p>- Continue developing new decision support plug-ins for integration with Tactical Assault Kit (TAK), including the Android, web, Windows OS, and virtual and augmented reality versions, to further enhance the TAK infrastructure and cross-community tools and develop a rapid and iterative software capability.</p> <p>- Complete development of Graphical Processing Unit (GPU)-based faster-than-real-time, high resolution hazard prediction modeling capabilities and continue user testing.</p> <p>- Finalize the development of approaches to translate raw sensor data and publish to a common standard.</p> <p>FY 2024 Plans:</p>		-	3.000	3.500

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Chemical and Biological Defense Program		Date: March 2023		
Appropriation/Budget Activity 0400 / 3	R-1 Program Element (Number/Name) PE 0603384BP / <i>Chemical and Biological Defense Program - Advanced Development</i>	Project (Number/Name) UN3 / <i>Understand (ATD)</i>		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2022	FY 2023	FY 2024
<p>- Continue developing new decision support plug-ins for integration with TAK, including the Android, web, Windows OS, and virtual and augmented reality versions, to further enhance the TAK infrastructure and cross-community tools and develop a rapid and iterative software capability.</p> <p>FY 2023 to FY 2024 Increase/Decrease Statement: Increase due to change in program/project technical parameters.</p>				
<p>Title: 3) CBRN Situational Awareness</p> <p>Description: To enhance chemical and biological (CB) Situational Awareness, Science & Technology will expand the types of CB threats that can be modeled with hazard assessment capabilities to include those from fixed-wing and rotary-wing drones of interests and allow for airborne CB releases from single drones and swarms to be modeled. Leverage Virtual Reality (VR) and Augmented Reality (AR) technologies to develop CB focused training and mission rehearsal capabilities that will be integrated into systems widely used by the Joint Force. Modernize hazard modeling capabilities by adopting a modular framework and integrating across Service command and control systems. Enhance hazard modeling by creating a seamless indoor- to-outdoor transport and dispersion (T&D) modeling capability and improve urban T&D modeling to support operations in urban and mixed environments. Leverage new state-of-the-art computational fluid dynamics modeling techniques and their use of computing resources to increase both modeling speed and accuracy. Develop CB health effect modeling software and analytic tools to support force readiness and facilitate medical planning against chemical and biological agents. Develop epidemiological models that quantify and visualize mission operational impacts from exposure to, and spread of, infectious biological threat agents. Leverage Threat Agent Science (TAS) data to enhance modeling health effects and host pathogen interactions from exposures to traditional and non-traditional CB agents, providing the warfighter with more accurate casualty estimates accounting for human health effects.</p> <p>FY 2023 Plans:</p> <ul style="list-style-type: none"> - Continue configuration management of science and technology prototype for transition of upgraded capabilities. - Continue improvement of performance enhancements for T&D models, particularly for urban environments. - Continue the development of comprehensive infectious disease epidemiological modeling applications for disease prediction, forecasting, medical planning and treatment. - Continue to enhance CB situational awareness capabilities for integration into Head up Display (HUD) technologies for tactical use. - Build out pipelines for ingestion and storage of disparate chemical and biological threat datasets and advanced analytic development to support the CBDP medical enterprise. <p>FY 2024 Plans:</p>		-	3.888	6.690

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Chemical and Biological Defense Program		Date: March 2023		
Appropriation/Budget Activity 0400 / 3	R-1 Program Element (Number/Name) PE 0603384BP / <i>Chemical and Biological Defense Program - Advanced Development</i>	Project (Number/Name) UN3 / <i>Understand (ATD)</i>		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2022	FY 2023	FY 2024
<ul style="list-style-type: none"> - Complete development of a digital environment prototype for science and technology software modernization using a Development, Security, and Operations (DevSecOps) framework. - Continue improvement of performance enhancements for T&D models, particularly for urban environments and for hazard release from drone platforms and alternate types of delivery mechanisms. - Continue the development of comprehensive infectious disease epidemiological modeling applications for disease prediction, forecasting, medical planning and treatment. - Continue to enhance CB situational awareness capabilities for integration into Heads up Display (HUD) technologies for tactical use. - Continue work to ingest and store disparate chemical and biological threat datasets and advanced analytic development to support the CBDP medical enterprise. - Expedite the development of a CB Defense Digital Laboratory capability encompassing a DevSecOps environment for end-to-end AI/ML data analysis, model development and training, and agile software development. <p>FY 2023 to FY 2024 Increase/Decrease Statement: Increase due to change in program/project technical parameters.</p>				
<p>Title: 4) CBRN Battlespace Surveillance, Alerting & Response - Enhanced Biodefense (ENBD)</p> <p>Description: Focus on a passive, wearable, contactless screening capability would greatly enhance the Warfighters' ability to seek medical treatment at the earliest indication of exposure. This area includes data collection and analysis of exposure data; competitive prototyping to further develop algorithms that are able to non-invasively identify afflicted personnel and inform courses of action, prior to the onset of symptoms; expansion of efforts to develop analytic resources for early warning/decision support; and S&T for an advanced, integrated cloud based data environment to store a dynamic knowledge base of biothreat characteristics.</p> <p>FY 2023 Plans:</p> <ul style="list-style-type: none"> - Examine feasibility of isolating indicators of respiratory infection, determining severity of infection, and predicting return to mission readiness after exposure. - Leverage competitive prototyping to explore and evaluate alternative concepts for providing remote sensing and/or minimally- and non-invasive techniques to enhance our ability to quickly identify afflicted personnel and inform courses of action, ideally prior to the onset of symptoms. - Development of an advanced, integrated cloud based data environment to store a dynamic knowledge base of biothreat characteristics; capability would support automated data ingestion, collection, curation, search, and advanced analytics of data. <p>FY 2024 Plans:</p>		-	2.400	2.500

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Chemical and Biological Defense Program		Date: March 2023
Appropriation/Budget Activity 0400 / 3	R-1 Program Element (Number/Name) PE 0603384BP / <i>Chemical and Biological Defense Program - Advanced Development</i>	Project (Number/Name) UN3 / <i>Understand (ATD)</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2022	FY 2023	FY 2024
<p>- Continue to isolate and identify indicators of respiratory infection that can be used in determining severity of infection, and predicting return to mission readiness after exposure.</p> <p>- Continue competitive prototyping to evaluate alternative concepts for providing remote sensing and/or minimally and non-invasive techniques to enhance our ability to quickly identify afflicted personnel and inform courses of action, ideally prior to the onset of symptoms.</p> <p>- Continue the development and expansion of an advanced, integrated cloud based data environment to store a dynamic knowledge base of biothreat characteristics; capability would support automated data ingestion, collection, curation, search, and advanced analytics of data.</p> <p>FY 2023 to FY 2024 Increase/Decrease Statement: Minor change due to routine program adjustments.</p>			
<p>Title: 5) CBRN Decision Aids - Enhanced Biodefense (ENBD)</p> <p>Description: Focus on improved solutions for comprehensive biothreat characterization in support of CBDP biodefense modernization goals, to include leveraging a cloud based data environment of biothreat characteristics, data sources, repositories created and curated under the CBRN Battlespace Sensing, Alerting, and Response thrust area. Cloud based data environment will be leveraged and data streams will be translated into actionable information for transmission to and use on end-user devices (EUDs).</p> <p>FY 2024 Plans: -Explore and initiate efforts that will utilize data streams from a cloud based data environment to provide actionable information about biological threats and exposures on EUDs.</p> <p>FY 2023 to FY 2024 Increase/Decrease Statement: Additional investment in enhanced biodefense and pandemic preparedness.</p>	-	-	1.000
<p>Title: 6) CBRN Situational Awareness - Enhanced Biodefense (ENBD)</p> <p>Description: Focus on exploring solutions for comprehensive biothreat characterization in support of CBDP biodefense modernization goals, including the development of data analytics using machine learning and artificial intelligence (ML/AI) and efforts to provide a suite of analytic tools for biological threat agent modeling, forecasting, and prediction to determine optimal defense postures. Utilize scientific data generated during the course of technology development and hazard assessment data) to help inform operational utility. Develop epidemiological models that quantify risk and visualize mission operational impacts accounting for medically relevant inputs from exposure to and spread of CB threat agents of relevance to DoD.</p> <p>FY 2023 Plans: - Expand development of analytic tools for biological threat agent surveillance, modeling, forecasting, and prediction.</p>	-	3.000	2.500

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Chemical and Biological Defense Program		Date: March 2023
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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2022	FY 2023	FY 2024
<p>- Accelerate and expand efforts to develop data analytics using ML/AI to predict individual warfighter susceptibility to acute CB agent exposure based on advanced omics, epigenetics, host immune responses, and wearables data sources.</p> <p>- Explore feasibility of mathematical models for innate immune recognition based on clinical data and prediction of signature patterns associated with bacterial vs. viral pathogens.</p> <p>FY 2024 Plans:</p> <p>- Continue the development of analytic tools for biological threat agent surveillance, modeling, forecasting, and prediction.</p> <p>- Continue efforts to develop data analytics using ML/AI to predict individual warfighter susceptibility to acute CB agent exposure based on advanced omics, epigenetics, host immune responses, and wearables data sources.</p> <p>- Continue to explore mathematical models for innate immune recognition based on clinical data and prediction of signature patterns associated with bacterial vs. viral pathogens.</p> <p>FY 2023 to FY 2024 Increase/Decrease Statement: Decrease due to change in program/project technical parameters.</p>			
<p>Title: 7) Battlefield Readiness</p> <p>Description: Develop platforms to prepare the Warfighter with rapid and easy to use diagnostics tests to make sure they are healthy and ready for movement. Platforms developed with affinity-based identification of either pathogen or host response to the pathogen may leverage immunodiagnostics to identify specific targets using antibodies, or explore other innovative approaches. This will enable broader and more accurate diagnosis for a range of targets and across a wider window following exposure. Investments in this area will provide capabilities to the Warfighter that increase the speed of relevancy, enhance troop preparedness, aid with triage support, and provide diagnosis at lower roles of care.</p> <p>FY 2023 Plans:</p> <p>- Complete the development and evaluation of a customizable, lightweight, comfortable, in ear wearable device (EWD) and algorithms to detect disease onset by monitoring a Warfighter's health state.</p> <p>- Complete the development of vertical flow assay technologies that are rapid, capable of multiplexing, portable, and may result in a faster sample to answer and more sensitive detection level than traditional lateral flow diagnostics.</p> <p>- Complete the program to identify biological indicators that predict disease severity, which will lead to the development of a diagnostic that alerts medical personnel that a patient's condition may worsen or require immediate intensive care.</p> <p>- Continue a wearable effort for developing and testing a microneedle-based patch intended to screen for the presence of a viral or bacterial infection, this focus on minimally invasive testing techniques along with easy to use wearables will further support DoD mission readiness.</p>	-	6.700	5.085

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Chemical and Biological Defense Program		Date: March 2023		
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B. Accomplishments/Planned Programs (\$ in Millions)		FY 2022	FY 2023	FY 2024
<p>- Continue the development of a POC diagnostic platform that can provide the Warfighter pre-symptomatic diagnosis of infection, irrespective of whether the underlying pathogens are viral, bacterial, or parasitic.</p> <p>FY 2024 Plans:</p> <ul style="list-style-type: none"> - Continue investigating minimally invasive testing methods and reduce diagnostic windows, even to pre-symptomatic identification. - Continue the development of a Point of Contamination (POC) diagnostic platform, capable of pre-symptomatically diagnosing infection within minutes and transition technology to Joint Program Executive Office for Chemical, Biological, Radiological and Nuclear Defense's (JPEO-CBRND) Advanced Differential Diagnostics (ADD) program. Pre-symptomatic evaluation will enable forces to determine personnel who are ideal candidates for troop movements or basic training. - Continue the development of a non-invasive diagnostic platform that can predict severity of disease which will enable logistical and resource optimization as well as quicker return of duty for a majority of patients. <p>FY 2023 to FY 2024 Increase/Decrease Statement: Decrease due to change in program/project technical parameters.</p>				
<p>Title: 8) Chemical Diagnostics</p> <p>Description: Provide innovative and integrated capabilities to the Warfighter that are able to diagnose threats across the chemical spectrum. Enhance force protection by investing in diagnostics for exposure to traditional and nontraditional CWAs, including pharmaceutical based agents. Coordinate with the Intelligence Community (IC) to understand the chemical threat space, adapting capabilities to meet the need.</p> <p>FY 2023 Plans:</p> <ul style="list-style-type: none"> - Continue efforts that expand the capability of wearable devices from an alert to an U.S. Food & Drug Administration (FDA) approved diagnostic platform that can detect a chemical threat and allow a physician to diagnose and determine a treatment strategy for exposure to traditional/ nontraditional chemical agents. <p>FY 2024 Plans:</p> <ul style="list-style-type: none"> - Continue efforts that expand the capability of wearable devices from an alert to an FDA-approved diagnostic platform that can detect a chemical threat and allow a physician to diagnose and determine a treatment strategy for exposure to traditional/ nontraditional chemical agents. <p>FY 2023 to FY 2024 Increase/Decrease Statement: Decrease due to change in program/project technical parameters.</p>		-	1.914	1.695
<p>Title: 9) Clinical Evaluation</p>		-	1.914	0.848

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Chemical and Biological Defense Program		Date: March 2023
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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2022	FY 2023	FY 2024
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Description: Optimize the diagnostic development pathway by incorporating independent testing and evaluation for more informed prototype transition prior to advanced development. Investments in this area allow e evaluation of diagnostic platforms through real world, austere environment testing. This area maintains access to research sites that offer native populations exposed to diseases of interest that would affect the warfighter in battlefield settings, and provides the ability to acquire novel technologies and provide analytical testing, evaluation, and reach back support for technologies already fielded.

- FY 2023 Plans:**
- Continue to maintain the capability to access clinical samples for infectious diseases of interest, and collaborate with sites around the world where diseases of concern are circulating.
 - Initiate independent third-party testing - to establish clinical and performance parameters to evaluate diagnostic platforms through real world, austere environment testing and evaluation prior to transition.

- FY 2024 Plans:**
- Continue to maintain the capability to access clinical samples for infectious diseases of interest, and collaborate with sites around the world where diseases of concern are circulating.
 - Continue independent third-party testing - to establish clinical and performance parameters to evaluate diagnostic platforms through real world, austere environment testing and evaluation prior to transition.

FY 2023 to FY 2024 Increase/Decrease Statement:
Decrease due to change in program/project technical parameters.

Title: 10) Diagnostic Building Blocks	-	4.786	5.934
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Description: Develop novel, state of the art capabilities that lay the foundation for modernizing other areas within the diagnostics portfolio. This includes exploiting areas such as synthetic biology and chemistry to develop novel and rapid diagnostic tests for utilization in the event of an outbreak of an unknown threat. Invest in efforts that lead to accelerated assay development timelines and optimized test parameters through leveraging artificial intelligence (AI) and machine learning (ML) to allow us to quickly pivot and develop assays for emerging threats in days instead of weeks.

- FY 2023 Plans:**
- Initiate field validation studies for diagnostics prototypes using synthetic binders and evaluate performance against current gold standard diagnostic methods.
 - Continue efforts to collect the baseline data required for future development of a whole breath diagnostic platform use of breath as a non-invasive sampling mechanism offers Warfighters little-to-no interruption to mission activities and provides the opportunity for earlier diagnosis/indication of infection or chemical exposure.

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Chemical and Biological Defense Program	Date: March 2023
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Appropriation/Budget Activity 0400 / 3	R-1 Program Element (Number/Name) PE 0603384BP / <i>Chemical and Biological Defense Program - Advanced Development</i>	Project (Number/Name) UN3 / <i>Understand (ATD)</i>
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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2022	FY 2023	FY 2024
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<p>- Continue executing data transitions for the development of diagnostic assays to support vaccine and countermeasure development efforts.</p> <p>- Complete a joint effort with CBDP Components to establish an assay development and manufacturing process that would allow DoD laboratories to be authorized assay developers, enabling the DoD to develop assays against emerging threats and diseases to quickly be functionalized for the fielded Next Generation Diagnostics System (NGDS) 2 Man Portable Diagnostic System (MPDS) platform.</p> <p>FY 2024 Plans:</p> <p>-Continue field validation studies for diagnostics prototypes using synthetic binders and evaluate performance against current gold standard diagnostic methods and integrate enzymes to create inexpensive, on-demand, diagnostics with reduced logistical burdens.</p> <p>-Continue efforts to collect the baseline data required for future development of a whole breath diagnostic platform the use of breath as a non-invasive sampling mechanism offers warfighters little-to-no interruption to mission activities and provides the opportunity for earlier diagnosis/indication of infection or chemical exposure.</p> <p>- Initiate efforts to identify and establish testing methods utilizing low to minimally invasive clinical matrices. Matrices like breath, sweat or interstitial fluid could significantly expand field-forward testing abilities and minimize requirements for trained personnel to collect and administer testing.</p> <p>FY 2023 to FY 2024 Increase/Decrease Statement: Increase due to change in program/project technical parameters.</p>			
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<p>Title: 11) Emerging Threats</p> <p>Description: Push beyond the boundaries of the traditional threat list in the field of diagnostics to better prepare for surprise. Development of diagnostic systems that leverage novel approaches to characterize pathogen or host response and can identify the classification of threat (e.g., bacterial vs viral) from an unknown sample. Invest in diagnostic tests that enable the delivery of actionable information, such as administering the appropriate medical countermeasure (e.g. antibiotic, antiviral, vaccine), by a medic or primary care provider greatly improves turnaround time for soldier wellness and return to duty.</p> <p>FY 2023 Plans:</p> <p>- Complete efforts to address challenges in small molecule toxin diagnosis at the point of contamination (POC) and initiate validation of these prototypes for potential use as a threat agnostic capability to enable field-forward responses to emerging threats.</p>	-	2.828	3.391
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Exhibit R-2A, RDT&E Project Justification: PB 2024 Chemical and Biological Defense Program		Date: March 2023		
Appropriation/Budget Activity 0400 / 3	R-1 Program Element (Number/Name) PE 0603384BP / <i>Chemical and Biological Defense Program - Advanced Development</i>	Project (Number/Name) UN3 / <i>Understand (ATD)</i>		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2022	FY 2023	FY 2024
<p>- Complete the development of a universal blood sample preparation platform to be compatible with several diagnostic systems, improving the speed of sample preparation tools at low pathogen concentrations (i.e. pre-symptomatic levels) is one of the biggest challenges holding back diagnostics in point-of-care, outbreak, and remote testing scenarios.</p> <p>FY 2024 Plans:</p> <ul style="list-style-type: none"> - Initiate efforts to identify novel platforms that are capable of identifying broad classes of toxins in complex matrices. These platforms will ideally enable the diagnosis of exposure to toxins as well as other biological threats, resulting in a broad-spectrum capability in the hands of the warfighter. - Begin preliminary research efforts to diagnose biological threats that are truly unknown but could cause genomic or proteomic changes in infected individuals. <p>FY 2023 to FY 2024 Increase/Decrease Statement: Increase due to change in program/project technical parameters.</p>				
<p>Title: 12) Emerging and Enhanced Biothreat Sensing</p> <p>FY 2024 Plans:</p> <ul style="list-style-type: none"> - Expand early warning through wastewater surveillance capabilities to enable detect to warn capability and identification of unknown biological threats in Total Force populations. - Initiate technology to deliver capabilities to detect any pathogen, including engineered bioweapons. <p>FY 2023 to FY 2024 Increase/Decrease Statement: Additional investment to advance the overarching goals aligned with the 2022 National Biodefense Strategy and Implementation Plan (NBS).</p>		-	-	5.700
<p>Title: 13) Distributed Chemical Reconnaissance</p> <p>Description: Develop threat sensing and sampling payloads for manned and unmanned aerial system (UAS) and ground (UGS) platforms to enhance early warning and situational awareness of chemical threats. Sensor development will support dismounted reconnaissance and surveillance missions by providing low size, weight, power and cost sensors or sensing/collection systems that are rugged, rapid and accurate.</p> <p>FY 2023 Plans:</p> <ul style="list-style-type: none"> - Complete aerosol microsensor development. - Development toward a deployable microsensor development pipeline and enhance sensor integration efforts. <p>FY 2024 Plans:</p> <ul style="list-style-type: none"> - Continue development toward a deployable microsensor development pipeline and enhance sensor integration efforts. 		-	3.157	3.176

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Chemical and Biological Defense Program		Date: March 2023		
Appropriation/Budget Activity 0400 / 3	R-1 Program Element (Number/Name) PE 0603384BP / <i>Chemical and Biological Defense Program - Advanced Development</i>	Project (Number/Name) UN3 / <i>Understand (ATD)</i>		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2022	FY 2023	FY 2024
- Initiate efforts to modernize capabilities to reduce false alarms and increase sensitivity and specificity.				
FY 2023 to FY 2024 Increase/Decrease Statement: Minor change due to routine program adjustments.				
Title: 14) Expeditionary Analytical Toolkit (ExAnT) - Chemical Detection		-	14.757	17.269
Description: Provide general and specialized forces with the ability to modernize detection technologies for traditional threats while enhancing detection capabilities for non-traditional, emerging, and mixed chemical hazards.				
FY 2023 Plans:				
- Commence transition stand-off detector prototypes that identify and alert to chemical hazards to Proximate Chemical Agent Detector (PCAD) Program of Record.				
- Continue development toward detection prototypes to address pharmaceutical based agent (PBA) and other emerging threats.				
- Continue the development of sensor technologies against non-traditional threats of concern to develop class-based detection and reduce reliance on known threat libraries.				
FY 2024 Plans:				
- Transition stand-off detector prototypes that identify and alert to chemical hazards to PCAD Program of Record.				
- Continue development toward detection prototypes to address PBA and other emerging threats.				
- Continue the development of sensor technologies against non-traditional threats of concern to develop class-based detection and reduce reliance on known threat libraries.				
FY 2023 to FY 2024 Increase/Decrease Statement: Increase due to change in program/project technical parameters.				
Title: 15) Unconventional Chemical Detection Modalities		-	1.485	2.443
Description: Develop disruptive technologies to identify unknown or emerging chemical threats and develop chemical sensors that can operate in complex threat environments with high fidelity. This thrust area supports other thrust areas and as needed the Joint Force mission needs (e.g., expeditionary, perimeter defense, or unmanned reconnaissance).				
FY 2023 Plans:				
- Complete development and refinement of integrated photonics.				
- Complete development and refinement of miniaturized Raman spectrometers.				
- Complete development and refinement of machine learning algorithms for integrating disparate sensor feeds.				
- Initiate library-less detection efforts to move towards threat agnostic detection and provide rapid-fielded capabilities to address emerging chemical threats.				

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Chemical and Biological Defense Program		Date: March 2023
Appropriation/Budget Activity 0400 / 3	R-1 Program Element (Number/Name) PE 0603384BP / <i>Chemical and Biological Defense Program - Advanced Development</i>	Project (Number/Name) UN3 / <i>Understand (ATD)</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2022	FY 2023	FY 2024
<p>- Continue development of state of the art size and speed of detection technologies that include advances in computational tools, Artificial Intelligence (AI)/Machine Learning (ML) to address the most difficult changes in chemical detection.</p> <p>FY 2024 Plans:</p> <ul style="list-style-type: none"> - Continue pursuing advances in photonic integrated circuits by reducing size, weight and power of traditional photonic sensors but keeping the selectivity and sensitivity of a traditional sensor. - Incorporating early warning and threat mapping using ML/AI tools to aggregate and analyze sensor data in real-time. - Continuing library-less detection to surmount current sustainment limitations of library-based or analyte-specific chemical sensor to be updated to detect emerging threats. - Continue development in machine learning (ML) and artificial intelligence (AI) to make sensor detection faster with reduced false alarm rates. <p>FY 2023 to FY 2024 Increase/Decrease Statement: Increase due to change in program/project technical parameters.</p>			
<p>Title: 16) Battlefield Readiness - Biodefense Improvement Program</p> <p>Description: Provide non-invasive disease screening capabilities to rapidly respond to emerging biological threats and greatly enhance the warfighters ability to seek medical treatment at the earliest indication of exposure.</p> <p>FY 2024 Plans:</p> <ul style="list-style-type: none"> - Expand development of Wearable technologies to evaluate customizable hardware and algorithms that detect warfighters autonomic- response to biological warfare agents, both natural and unnatural. <p>FY 2023 to FY 2024 Increase/Decrease Statement: Increase due to change in program/project technical parameters.</p>	-	-	4.235
<p>Title: 17) Diagnostic Building Blocks - Biodefense Improvement Program</p> <p>Description: Provide agile assay development capabilities aided by Artificial Intelligence (AI) to advance the speed and accuracy of diagnostic assay design, addressing a key functional capability needed for emerging biological threat response.</p> <p>FY 2023 Plans:</p> <ul style="list-style-type: none"> - Expand the development of agile biological assays to reduce the design assay and increase assay quality to better respond to emerging biological threats. <p>FY 2024 Plans:</p>	-	1.500	1.347

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Chemical and Biological Defense Program		Date: March 2023		
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B. Accomplishments/Planned Programs (\$ in Millions)		FY 2022	FY 2023	FY 2024
<p>- Continue the development of agile biological assays to reduce the design assay and increase assay quality to better respond to emerging biological threats.</p> <p>FY 2023 to FY 2024 Increase/Decrease Statement: Minor change due to routine program adjustments.</p>				
<p>Title: 18) Emerging and Enhanced Biothreat Sensing - Biodefense Improvement Program</p> <p>Description: Provide end users with a rapid assay capability (< 6 weeks from discovery of emerging/enhanced threat to delivery of the initial assay) that will be disruptive to current detection and diagnostic timelines. Eliminate the need to rely on single-source reagents to rapidly respond to emerging biological threat.</p> <p>FY 2023 Plans: - Accelerate assay development to provide rapid, agile, and scalable biodetection technology to quickly address emerging biological threats and allow the warfighter to use a highly-specific assay that is built to minimize logistics burden and is user-friendly.</p> <p>FY 2024 Plans: - Continue assay development to provide rapid, agile, and scalable biodetection technology to quickly address emerging biological threats and allow the warfighter to use a highly-specific assay that is built to minimize logistics burden and is user-friendly.</p> <p>FY 2023 to FY 2024 Increase/Decrease Statement: Decrease due to change in program/project technical parameters.</p>		-	2.200	1.865
<p>Title: 19) Emerging Threats - Biodefense Improvement Program</p> <p>Description: Expand on agnostic disease screening and sensing capabilities for emerging biological threats.</p> <p>FY 2023 Plans: - Expand investments in agnostic sensing/screening capabilities for multiple sample types and environments that are end user-friendly and can be deployed in the field.</p> <p>FY 2024 Plans: - Continue prototype development investments in agnostic sensing/screening capabilities for multiple sample types and environments that are end user-friendly and can be deployed in the field.</p> <p>FY 2023 to FY 2024 Increase/Decrease Statement: Increase due to change in program/project technical parameters.</p>		-	1.000	3.170
<p>Title: 20) Technical Surprise - Biodefense Improvement Program</p>		-	3.000	0.500

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Chemical and Biological Defense Program		Date: March 2023
Appropriation/Budget Activity 0400 / 3	R-1 Program Element (Number/Name) PE 0603384BP / <i>Chemical and Biological Defense Program - Advanced Development</i>	Project (Number/Name) UN3 / <i>Understand (ATD)</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2022	FY 2023	FY 2024
<p>Description: Technical Surprise assesses technological advancements for potential implications to the threat space, including agent use and release. Technical Surprise includes horizon scanning to identify potential areas of concern as well as conducts technical assessments of emerging technological advancements (e.g. biotechnology, artificial intelligence, machine learning, quantum computing). This program develops capabilities to evaluate and assess technical enhancements that may alter the nature or magnitude of a threat agent. The technical surprise program will be evaluating technologies and convergence of technologies that improve the ease of threat use and make threats more likely to survive being released. The program will identify the limitations and barriers associated with synthetic biology and assess the implications. And finally, these efforts will identify and assess former technology hurdles that have been lowered or overcome and assess implications of increasing potential threat.</p> <p>FY 2023 Plans:</p> <ul style="list-style-type: none"> - Identify and assess technological advancements that will impact the biological threat space, including potential threats that have implications to biological defense capabilities. - Use horizon scanning capability to provide situational awareness in assessing technological growth and convergence that can affect the threat space, while keeping abreast of changes in the nature of future threats. - Assessment of synthetic biological tools and other biotechnology developments that can enhance or alter the threat space. <p>FY 2024 Plans:</p> <ul style="list-style-type: none"> - Complete the Threat Area Panel (TAP) efforts at US Army Medical Research Institute of Infectious Disease (USAMRIID). Complete and augment horizon scanning capabilities, including identification of knowledge gaps for emerging/future agents enhancing or altering the biological threat space, and use these to inform more focused studies within Threat Agent Science. <p>FY 2023 to FY 2024 Increase/Decrease Statement: Program/project is entering completion and all activities will be closed.</p>			
<p>Title: 21) Distributed Biological Reconnaissance</p> <p>Description: Develop threat sensing and sampling payloads for manned and unmanned aerial system (UAS) and ground (UGS) platforms to enhance early warning and situational awareness of biological and chemical threats. Sensor development will support dismounted reconnaissance and surveillance missions by providing low size, weight, power and cost sensors or sensing/collection systems that are rugged, rapid and accurate. Early indications from capabilities under CB Reconnaissance will allow for enhanced warning of threats.</p> <p>FY 2023 Plans:</p> <ul style="list-style-type: none"> - Continue to develop innovative sensor solutions to increase situational threat awareness and provide operational advantage. - Continue to develop low-cost, low Size, Weight and Power (SWaP), and low-burden, with little to no dependence on supply chain, detection technologies to support of tactical and dismounted site assessment missions. 	-	1.598	1.741

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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2022	FY 2023	FY 2024
<p>- Continue to enhance sensing capabilities for unmanned vehicles and its integration into mobile platforms.</p> <p>FY 2024 Plans:</p> <ul style="list-style-type: none"> - Continue to develop innovative sensor solutions and make technological improvements to include early warning of aerosolized biological threats. -Continue to explore fundamental science and novel technologies to increase sensing performance through enhanced speed and specificity; low size, weight, and power (SWaP); low-burden; and reduced consumables and life-cycle costs of fielded biological sensors. - Continue developing enhanced sensing capabilities and sampling systems, to include unmanned vehicles and mobile platforms. - Initiate the use of computational tools, like machine learning, into detector/identifier technologies to further reduce false reporting due to environmental factors. <p>FY 2023 to FY 2024 Increase/Decrease Statement: Minor change due to routine program adjustments.</p>			
<p>Title: 22) Emerging and Enhanced Biothreat Sensing</p> <p>Description: Establish robust capability to assess emerging and enhanced biological threats to rapidly develop biosensors for detecting emerging or enhanced biological threats. Quickly develop adaptable, analyte-agnostic laboratory and field-forward detection capabilities to provide a spectrum of improved detection assets for novel threats. This thrust area leverages multi-omics data science or the combining multiple measurements to inform rational and rapid design and development of biodetection solutions. Synthetic biological concepts will be thoroughly evaluated and exploited for the development of biosensing solutions and refinement of laboratory methods.</p> <p>FY 2023 Plans:</p> <ul style="list-style-type: none"> - Continue development of detection and identification capabilities that discern if pathogens are genetically manipulated and/or identify pathogens of unknown origin. - Continue development of algorithms and laboratory workflows to identify threats in unknown samples. - Transition far-forward pathogen agnostic sensing toolkit to provide on-site threat identification while reducing the burden on the Warfighter by using technologies that rely on little to no supply chain disposables. - Continue development of on-demand biological threat detection assays that provide the Warfighter with the ability to rapidly respond to emerging biological threats and provide only the assay needed for threat identification and therefore reducing cost and reagents needed by most current assay kits. <p>FY 2024 Plans:</p> <ul style="list-style-type: none"> - Continue development of detection and identification capabilities that discern if pathogens are genetically manipulated and/or identify pathogens of unknown origin. 	-	2.069	3.453

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Chemical and Biological Defense Program		Date: March 2023		
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B. Accomplishments/Planned Programs (\$ in Millions)		FY 2022	FY 2023	FY 2024
<ul style="list-style-type: none"> - Continue development of detection algorithms, laboratory workflows, and implementation of bioinformatics analysis tools to identify threats in unknown samples - Continue development of assays on demand biological threat detection assays that provide the Warfighter with the ability to rapidly respond to emerging biological threats and provide only the assay needed for threat identification and therefore reducing cost and reagents needed by most current assay kits. <p>FY 2023 to FY 2024 Increase/Decrease Statement: Increase due to change in program/project technical parameters.</p>				
<p>Title: 23) Unattended Perimeter Monitoring - Biological Detection</p> <p>Description: Establish a layered defense capability by developing and implementing automated and integrated technologies enabling unattended monitoring for chemical and biological threats. These technologies will provide early warning of vapor, aerosol, solid, and liquid hazards and unencumber the Warfighter by reducing logistics and operator burden. Providing a reliable detect-to-warn capability at fixed or expeditionary sites will enhance the overall protective posture of ground and maneuver forces as robust technologies can be miniaturized for portability and operational sustainment.</p> <p>FY 2023 Plans:</p> <ul style="list-style-type: none"> - Transition automated biological collection, detection and identification system. Fully autonomous system will reduce errors by eliminating the need for laboratory personal to perform analysis. - Initiate efforts to modernize capabilities to reduce false alarms and increase sensitivity and specificity. <p>FY 2024 Plans:</p> <ul style="list-style-type: none"> - Continue efforts to modernize capabilities to reduce false alarms and increase sensitivity and specificity. <p>FY 2023 to FY 2024 Increase/Decrease Statement: Minor change due to routine program adjustments.</p>		-	1.177	1.283
<p>Title: 24) Unconventional Biological Detection Modalities</p> <p>Description: Develop disruptive technologies to identify unknown or emerging biological threats and develop biological sensors that can operate in complex threat environments with high fidelity. This effort supports the Joint Force mission needs (e.g., expeditionary, perimeter defense, or unmanned reconnaissance).</p> <p>FY 2023 Plans:</p> <ul style="list-style-type: none"> - Complete development and refinement of integrated photonics. - Complete development and refinement of miniaturized Raman spectrometers. - Complete development and refinement of machine learning algorithms for integrating disparate sensor feeds. 		-	0.871	-

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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2022	FY 2023	FY 2024
- Initiate library-less detection efforts to move towards threat agnostic detection and provide rapid-fielded capabilities to address emerging biological threats. - Continue development of state of the art size and speed of detection technologies that include advances in computational tools, Artificial Intelligence (AI)/Machine Learning (ML) to address the most difficult changes in biological detection. FY 2023 to FY 2024 Increase/Decrease Statement: Decrease due to change in program/project schedule.			
Accomplishments/Planned Programs Subtotals	-	68.415	83.825

C. Other Program Funding Summary (\$ in Millions)											
Line Item	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
• UN4: <i>Understand (ACD&P)</i>	-	52.708	61.638	-	61.638	64.399	48.874	41.264	38.169	Continuing	Continuing

Remarks

D. Acquisition Strategy

N/A

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Chemical and Biological Defense Program **Date:** March 2023

Appropriation/Budget Activity 0400 / 3	R-1 Program Element (Number/Name) PE 0603384BP / <i>Chemical and Biological Defense Program - Advanced Development</i>	Project (Number/Name) PT3 / <i>Protect (ATD)</i>
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COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
PT3: <i>Protect (ATD)</i>	-	0.000	32.113	29.261	0.000	29.261	48.969	42.794	46.159	52.581	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Protect Advanced Technology Development (ATD) Project enhances mission performance while providing effective protection against current and emerging chemical and biological (CB) threats, enables Joint Force lethality by protecting Warfighters against adverse effects of CB hazards, and fields protection capabilities against engineered biological agents, opioids and other Pharmaceutical Based Agents (PBAs), and Fourth Generation Agents (FGAs). In FY 2023, the Chemical Biological Defense Program (CBDP) RDT&E Projects were restructured to align with the CBDP portfolio construct. PT3 efforts in FY 2022 remain in Projects CB3 and TM3. This restructuring provided standardization and alignment across CBDP research, development and acquisition efforts.

Thrust Areas included in this Project are:

- (1) Biological Warfare Defense Prophylaxis
- (2) Air Purification Enhancements
- (3) All-Hazards & Respiratory Protection
- (4) Dynamic Multifunctional Materials for Second Skin
- (5) Enhanced Survivability Coatings
- (6) Lightweight Protective Garments
- (7) Multifunctional Materials for Protection
- (8) Nerve Agent Prophylaxis/Pretreatments

Biological Warfare Defense Prophylaxis: Provides the Warfighter protection against biothreat agents through the pre-exposure administration of prophylactics against known bacterial, viral and toxin agents of interest and emerging infectious threats. Medical countermeasure (MCM) strategies against broader classes of biological agents will be pursued with emphasis on broad-spectrum protection based on mechanism of action. The manufacturing and formulation processes for platform technologies will be adapted to maximize flexibility, increase stability, shelf life, and expand storage conditions. Efforts will also be adapted to maximize delivery flexibility through modifying delivery routes, which will allow for dose and reagent sparing.

Air Purification Enhancements: Optimizes and extends filter life and reduces lifecycle costs while maintaining or enhancing protection against all chemical weapons agents and toxic industrial chemicals/materials. Improves integration of collective protection into developmental Service major combat platforms. Investigates existing filtration performance against emerging and non-traditional threats and identify and develop countermeasures. Efforts include additional investments in enhanced biodefense and pandemic preparedness.

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All Hazards and Respiratory Protection: Develops next generation general purpose mask that unencumbers the warfighter, integrates with existing system technology, and closes capability gaps in current technologies. Supports special purpose units (e.g., special operations, Civil Support Teams, Explosive Ordnance Disposal) and modernization efforts to insert new, scalable protection technologies into current respirator programs of record that protect against the full spectrum of threats for the full range of military operations. Develops next generation antimicrobial respiratory protection. Efforts include additional investments in enhanced biodefense and pandemic preparedness.

Dynamic Multifunction Materials for Second Skin: Efforts support percutaneous protection and will utilize responsive technologies to provide chemical and biological protective suits that adapt to the environment by synthesizing scaled samples via roll-to-roll manufacture which exhibit materials properties that reduce thermal burden and integrate with current combat garments. These technologies include interpenetrating polymer networks that will change moisture permeability and molecular selectivity on demand, and membranes with higher moisture vapor transfer rates than existing fabrics.

Enhanced Survivability Coatings: Addresses materiel surface ease of decontamination and resistance to chemical agent penetration. Develops durable temporary coatings that resist chemical agent absorption and are quickly decontaminated in the field and allow the rapid regeneration of combat power.

Lightweight Protective Garments: Advances garment material and ensemble technologies with revolutionary capability improvements using integrated, low encumbrance garment designs and fabrication for thermal burden reduction. Incorporates state-of-the-art threat protection technologies and supporting test methodologies and methods that provide operationally relevant, comparable test data on garments. Improves testing methods for rapid, operationally-relevant, consistent garment performance evaluation. Develops next generation antimicrobial percutaneous protection to extend protective garment service life and reduce logistics and lifecycle costs. Efforts include additional investments in enhanced biodefense and pandemic preparedness.

Multifunctional Materials for Protection: Supports Protection and Hazard Mitigation Core Capability Areas. Combines basic and applied research to discover, develop, engineer, and integrate novel, reactive/catalytic materials into next generation CB defense systems. Engineers and scales material manufacturing to maximize sorption, reactivity, and service life while unencumbering the warfighter. Characterizes materials using state-of-the-art ambient pressure spectroscopies for integration into next generation filters and protective garments that reactively decontaminate chemical warfare agents.

Nerve Agent Prophylaxis/Pretreatments: Obtain the first prophylactic MCMs designed to prevent severe morbidity and mortality upon exposure to nerve agents without the need for additional individual physical protective equipment.

B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2022	FY 2023	FY 2024
Title: 1) Biological Warfare Defense Prophylaxis	-	24.826	15.082
Description: The ultimate protection of the Warfighter is by pretreating the Warfighter to withstand any biological threat with no adverse side effects from the pretreatment. Such pretreatment would enable the Warfighter to work in a less restrictive environment, absent of any personal protective equipment allowing operation at peak performance. Investments support de-risking of candidates for transition into advanced development and includes: platform and prototype candidate maturation, pre-clinical studies for lead candidates to allow initiation of clinical work, regulatory science to support clinical initiation, animal model			

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Chemical and Biological Defense Program		Date: March 2023
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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2022	FY 2023	FY 2024
<p>development for Food and Drug Administration (FDA) animal rule licensure, and Phase 1 clinical trials. Candidates transition into advanced development once the Phase 1 clinical trial is complete.</p> <p>FY 2023 Plans:</p> <p>Bacterial:</p> <ul style="list-style-type: none"> - Complete Good Manufacturing Practices (GMP) manufacturing for Tularemia prophylaxis with the ClpB vaccine and Burkholderia Capsular Polysaccharide-bacterial virulence factor (CPS) conjugate vaccine for advancement to clinical Phase 1. - Complete manufacturing and nonclinical development of adjuvanted plague vaccine for advancement to clinical Phase 1. - Initiate toxicology studies of adjuvanted plague vaccine in support of clinical Phase 1. - Continue non-clinical safety and efficacy studies of monoclonal antibody cocktail against plague and Burkholderia. - Continue layered defense studies for bacterial threats to test vaccines, antibody therapies and antibiotics in combination. - Continue non-clinical safety and efficacy studies on a live attenuated plague vaccine candidate for advancement to clinical Phase 1. - Initiate manufacturing of anthrax CPS conjugate vaccine candidate for advancement to clinical Phase 1. - Complete melioidosis human seroprevalence study in support of vaccine licensure. - Complete assay development in support of clinical Phase 1 for complex vaccines. <p>Viral:</p> <ul style="list-style-type: none"> - Complete current Good Manufacturing Practices (cGMP) manufacture of deoxyribonucleic acid (DNA) Vaccine for the upcoming Phase 1 clinical trial as well as pivotal nonclinical studies. - Continue cGMP manufacture of recombinant vesicular stomatitis Virus (rVSV) Marburg virus vaccine to support pivotal animal studies and upcoming Phase 1 clinical trial. - Complete investigation into correlates of protection for Marburg virus survivors to support pivotal animal studies. - Continue correlates of protection studies for alphavirus vaccine animal models. - Continue evaluation and mitigation studies of Filovirus aerosol pathology. - Continue development of rVSV Marburg vaccine in animal models to support investigational new drug (IND) submission. - Complete Investigational New Drug (IND) package for DNA vaccine for Venezuelan Equine Encephalitis (VEE) Virus for upcoming Phase 1 clinical trial. - Continued development of alphavirus animal models to support animal rule licensure of alphavirus vaccines - Continue assay qualification and validation for Marburg virus, and alphavirus vaccines. <p>Broad Spectrum:</p> <ul style="list-style-type: none"> - Continue development of the multivalent Nanolipoprotein (NLP) vaccine against multiple bacterial agents. 			

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Chemical and Biological Defense Program **Date:** March 2023

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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2022	FY 2023	FY 2024
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<p>- Continue non-clinical safety and efficacy studies with the broad spectrum NLP vaccine for advancement to clinical Phase 1.</p> <p>FY 2024 Plans: Bacterial: - Initiate Phase 1 vaccine clinical trial in collaboration with Australia for the Burkholderia OMV vaccine. - Continue building relationships in Madagascar to collect plague survivor samples for identification of vaccine antigen targets from emerging plague strains</p> <p>Viral: - Initiate Phase 1 clinical trial for the VEE deoxyribonucleic acid (DNA) Vaccine. - Continue preclinical development of Hydrovax pan-Alphavirus vaccine - Continue preclinical development of mucosal SARS CoV2 vaccine, expanding to multivalent coronavirus vaccine - Complete Current Good Manufacturing Practices (cGMP) manufacture of Recombinant Vesicular Stomatitis Virus rVSV Marburg virus vaccine and IND enabling studies to support pivotal animal studies and upcoming Phase 1 clinical trial. - Continue correlates of protection studies for viral vaccines. - Continue evaluation and mitigation studies of Filovirus aerosol pathology. - Continue development of rVSV Marburg vaccine in animal models to support investigational new drug (IND) submission. - Continued development of alphavirus animal models to support animal rule licensure of alphavirus vaccines - Continue assay qualification and validation for Marburg virus, and alphavirus vaccines</p> <p>Broad Spectrum: - Continue layered defense studies for pathogen threats to test vaccines, antibody therapies and antibiotics in combination to broaden protection. - Continue development of the multivalent Nanolipoprotein vaccine against multiple bacterial agents. - Continue preclinical development of universal cellular nanosponge MCM to protect against multiple respiratory viruses. - Continue non-clinical safety and efficacy studies with the broad spectrum NLP vaccine for advancement to clinical Phase 1. - Initiate development of oral multivalent mRNA vaccine</p> <p>FY 2023 to FY 2024 Increase/Decrease Statement: Decrease due to change in program/project technical parameters. All work associated with plague vaccines has been canceled</p>			
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Title: 2) Air Purification Enhancements	-	-	0.117
Description: Existing Collective Protection (ColPro) systems have high life cycle costs driven by maintenance and limited service life. Efforts will focus on optimizing and extending filter life to reduce lifecycle costs while maintaining or improving protection.			

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Chemical and Biological Defense Program **Date:** March 2023

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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2022	FY 2023	FY 2024
<p><i>FY 2024 Plans:</i></p> <ul style="list-style-type: none"> - Transition improved, compact vehicle ColPro system filters to the Modernization ColPro program of record to broaden the spectrum of threat protection and reduce production and replacement costs. - Transition the Residual Life Indicator System to the Modernization ColPro program of record to accurately predict remaining filter life, reducing cost and logistics for facility and shipboard ColPro systems. <p><i>FY 2023 to FY 2024 Increase/Decrease Statement:</i> Program/project funding transferred from another funding line. Project funding transferred from the Multifunctional Materials for Protection thrust area to support transition of Residual Life Indicator System to the Modernization ColPro program of record. Increase supports follow-up testing for transitioned technologies.</p>			
<p><i>Title:</i> 3) All-Hazards & Respiratory Protection</p> <p><i>Description:</i> Efforts will improve chemical and biological agent protection while maintaining warfighter capability through integrated research on respirator, seams, closures, and new manufacturing techniques and materials; perform early surveys for end-user jury input with frequent user operational evaluation; focus on low burden next generation protective mask.</p> <p><i>FY 2023 Plans:</i></p> <ul style="list-style-type: none"> - Continue to evaluate and assess systems that provide CB respiratory protection technologies in support of tactical all hazard, full spectrum respiratory protection system. - Transition operationally-relevant respirator fit testing system to Modernization Individual Protection program of record. - Transition specification for anti-fog lenses in respirators as a Ground Mask modification work order. - Continue to design and test prototypes for a low-encumbrance, next generation protective mask. <p><i>FY 2024 Plans:</i></p> <ul style="list-style-type: none"> - Transition a microcooling-garment system that extended the time for mission operations to the Tactical Advanced Threat Protective Ensemble (TATPE) effort under the UIPE FoS GP program of record. - Complete design challenge for next generation respiratory protection concepts. - Perform early user assessment of next generation prototype respiratory protection concepts in the form of a low-burden, unencumbering respirator that integrates with existing systems (e.g., helmets and displays) and may include off-the-face and low profile filter designs. <p><i>FY 2023 to FY 2024 Increase/Decrease Statement:</i> Increase due to change in program/project technical parameters.</p>	-	1.345	1.912
<p><i>Title:</i> 4) Dynamic Multifunction Materials for Second Skin</p>	-	1.170	-

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Chemical and Biological Defense Program		Date: March 2023
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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2022	FY 2023	FY 2024
<p>Description: This effort utilizes responsive technologies to provide CB protective suits that adapt to the environment by synthesizing scaled samples via roll-to-roll manufacture which exhibit materials properties that reduce thermal burden and integrate with current combat garments.</p> <p>FY 2023 Plans:</p> <ul style="list-style-type: none"> - Continue development and testing of protective garment materials that respond to the presence of chemical agents to increase Warfighter protection. - Begin integration of responsive systems into protective suit paradigms for whole system testing. <p>FY 2023 to FY 2024 Increase/Decrease Statement: Program/project funding transferred to another funding line. Dynamic Multifunctional Materials for Second Skin thrust area ends in FY23 and merges into the Lightweight Protection Garments, Enhanced Survivability Coatings, and Multifunctional Materials for Protection thrust areas starting in FY24.</p>			
<p>Title: 5) Enhanced Survivability Coatings</p> <p>Description: Efforts seek to produce enhanced coatings that increase chemical warfare agent survivability and decontaminatability of military materiel to levels comparable to that of stainless steel. Improved coatings will resist chemical agent absorption and be quickly decontaminated in field, to rapidly return materiel to unprotected mission operations level.</p> <p>FY 2023 Plans:</p> <ul style="list-style-type: none"> - Continue to characterize bio-inspired surface treatments for materiel coatings to repel agents of interest from materiel surfaces. - Evaluate and incorporate new or commercially-available appliques (to include chemical transport studies in current military coatings, novel coatings characterization, thin film overcoats, strippable coat, reactive coat, and lock-down coats) in support of CBRN Coatings, Coverings, and Protective Overlays. - Advance thin repellent film coating systems from fundamental research to applied research test and evaluation. <p>FY 2024 Plans:</p> <ul style="list-style-type: none"> - Transition candidate temporary overcoats that are commercially-available, improve success of decontamination, have low impact on signature, and reduce logistics to the TTC (Tactical Temporary Coatings) program of record. - Continue to evaluate and demonstrate industry polymer coatings as potential temporary or permanent military equipment coatings to decrease logistical burden of decontamination in support of the TTC program of record. - Conduct operational user assessments to validate temporary overcoats that improve decontamination for equipment elastomers. <p>FY 2023 to FY 2024 Increase/Decrease Statement:</p>	-	0.416	0.629

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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2022	FY 2023	FY 2024
Program/project funding transferred from another funding line. Project funding transferred from the Dynamic Multifunctional Materials for Second Skin thrust area which ends in FY23. Increase supports transition of candidate temporary overcoats to the TTC program of record in FY24.			
<p>Title: 6) Lightweight Protective Garments</p> <p>Description: Efforts will advance garment material and ensemble technologies with new capabilities using integrated garment designs and fabrication for thermal burden reduction, state-of-the-art threat protection technologies, and supporting test methodologies and methods that provide operationally relevant, comparable data on test garments.</p> <p>FY 2024 Plans:</p> <ul style="list-style-type: none"> - Manufacture scaled responsive/reactive prototype garments that adapt or react to the threat and environment while reducing thermal burden and integrate with current combat garments. - Test scaled responsive/reactive prototype garments using whole system test methods. <p>FY 2023 to FY 2024 Increase/Decrease Statement:</p> <p>Program/project funding transferred from another funding line. Project funding transferred from Dynamic Multifunctional Materials for Second Skin thrust area which ended in FY23. Increase supports whole system chemical permeation testing of textile swatches.</p>	-	-	0.117
<p>Title: 7) Multifunctional Materials for Protection</p> <p>Description: Efforts will discover, develop and integrate novel, reactive/catalytic materials and scale material manufacturing with maximum sorption and reactivity. They will characterize materials using state-of-the-art in operando and ambient pressure spectroscopies for eventual integration into next generation decontaminants, coatings, filters, and protective garments that reactively decontaminate chemical warfare agents.</p> <p>FY 2023 Plans:</p> <ul style="list-style-type: none"> - Continue to engineer reactive/catalytic nano-structure materials from basic research efforts for chemical agent destruction, to feed air purification enhancement. - Continue to integrate engineered reactive/catalytic nano-structure materials (derived from Applied Research efforts) into filters, decontaminants, and textiles to assess materials in an operationally-relevant environment for personnel decontamination. - Advance next generation materials to design reactive, regenerative protective garments with longer service life and lower thermal burden. <p>FY 2024 Plans:</p> <ul style="list-style-type: none"> - Generate prototype next generation reactive and regenerative protective garment prototypes with longer service life and lower thermal burden for whole system testing. 	-	0.756	1.404

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Chemical and Biological Defense Program		Date: March 2023
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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2022	FY 2023	FY 2024
<p>- Integrate responsive technologies to develop prototype protective suits that adapt to the environment by switching between low burden and high protection mode on demand in response to the presence of CB agents, offering proactive contamination protection.</p> <p>- Integrate reactive materials into filters for enhanced threat spectrum protection, extending service life and regenerative capacity.</p> <p>- Scale materials manufacturing processes for cost-efficiency.</p> <p>- Characterize materials using operationally-relevant test methods and conditions.</p> <p>FY 2023 to FY 2024 Increase/Decrease Statement: Program/project funding transferred from another funding line. Project funding transferred from the Dynamic Multifunctional Materials for Second Skin thrust area which ends in FY23. Increase supports development of prototype regenerative protective garments.</p>			
<p>Title: 8) Air Purification Enhancements - Enhanced Biodefense (ENBD)</p> <p>Description: This effort will focus on Improved Collective Protection (ColPro). Existing ColPro systems have high life cycle costs driven by maintenance and limited service life. Efforts will focus on optimizing and extending filter life to reduce lifecycle costs while maintaining or improving protection.</p> <p>FY 2023 Plans:</p> <ul style="list-style-type: none"> - Develop low cost, continuous-operation collective protection engineering standards and guidelines for temporary, rapid enhancement of unprotected Department of Defense (DoD) facilities during pandemic or biological warfare agent release. - Demonstrate and validate concepts for layered protection to mitigate the biological contamination risk with passive systems for applique and facility design features. <p>FY 2024 Plans:</p> <ul style="list-style-type: none"> - Generate validated experimental data that quantifies the range of biological infection risk reduction based on indoor air quality measurements. - Use appropriate, validated experimental methodologies to characterize and compare the impact of collective protection biological infection risk and cost, and plan operationally-relevant testing. 	-	2.000	2.000
<p>Title: 9) All-Hazards & Respiratory Protection - Enhanced Biodefense (ENBD)</p> <p>Description: Efforts will improve biological agent respiratory and ocular protection while maintaining warfighter capability through integrated research on respirator, seams, closures, and new manufacturing techniques and materials; perform early surveys for end-user jury input with frequent user operational evaluation; focus on low burden next generation protective mask specifically for protection against biological agents.</p> <p>FY 2023 Plans:</p>	-	1.000	1.500

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Chemical and Biological Defense Program		Date: March 2023		
Appropriation/Budget Activity 0400 / 3	R-1 Program Element (Number/Name) PE 0603384BP / <i>Chemical and Biological Defense Program - Advanced Development</i>	Project (Number/Name) PT3 / <i>Protect (ATD)</i>		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2022	FY 2023	FY 2024
<p>- Develop low cost, low burden, antimicrobial respiratory and ocular for operations specifically in a biologically contaminated environment.</p> <p>FY 2024 Plans:</p> <ul style="list-style-type: none"> - Identify potential antimicrobial textiles and innovative designs for respirators by partnering with industry, Department of Defense laboratories, and academic performers. - Evaluate textiles for bactericidal and bacteriostatic effects using standardized test methods. - Scale manufacturing of candidate antimicrobial textiles for respirator prototypes. <p>FY 2023 to FY 2024 Increase/Decrease Statement: Program/project funding transferred from another funding line. Funding transferred from Lightweight Protective Garments. Increase supports development and testing of antimicrobial respirator in FY24.</p>				
<p>Title: 10) Lightweight Protective Garments - Enhanced Biodefense (ENBD)</p> <p>Description: Efforts will advance garment material and ensemble technologies with new capabilities using integrated garment designs and fabrication for thermal burden reduction, state-of-the-art threat protection technologies, and supporting test methodologies and methods that provide operationally relevant, comparable data specifically for test garments that protect against biological threats.</p> <p>FY 2023 Plans:</p> <ul style="list-style-type: none"> - Develop low cost, low burden, antimicrobial respiratory and ocular for operations specifically in a biologically contaminated environment. <p>FY 2024 Plans:</p> <ul style="list-style-type: none"> - Partner with industry, Department of Defense laboratories, and academic partners to identify potential antimicrobial textiles for evaluation. - Down select and evaluate textiles for bactericidal and bacteriostatic effects using standardized test methods. - Scale manufacturing of candidate antimicrobial textiles for prototype garments. <p>FY 2023 to FY 2024 Increase/Decrease Statement: Program/project funding transferred to another funding line. Funding transferred to All Hazards Respiratory Protection.</p>		-	0.600	0.500
<p>Title: 11) Nerve Agent Prophylaxis/Pretreatments</p> <p>Description: Develop pretreatments and prophylactics that counter chemical warfare agents, including organophosphorus nerve agents (OPNA), using targeted and innovative science and technology efforts that will offer broad-spectrum protection, flexible route of administration, lower dose requirements, and reduced operational and logistical burden. The use of these medical</p>		-	-	6.000

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Chemical and Biological Defense Program		Date: March 2023
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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2022	FY 2023	FY 2024
countermeasures (MCM) will protect the lives and effectiveness of our Warfighters, thus maintaining force strength and force capability.			
<i>FY 2024 Plans:</i> - Continue to advance candidate bioconjugated organophosphorus hydrolase (OPH) mutants as catalytic nerve agent prophylaxes through current Good Manufacturing Practice (cGMP) production and on-Good Laboratory Practice (GLP)/GLP efficacy, toxicity and PK studies.			
<i>FY 2023 to FY 2024 Increase/Decrease Statement:</i> Program/project funding transferred from another funding line. FY 2024 funding has been transferred from MT4 to Project MT3 for better alignment under budget activity 3.			
Accomplishments/Planned Programs Subtotals	-	32.113	29.261

C. Other Program Funding Summary (\$ in Millions)											
<u>Line Item</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u> <u>Base</u>	<u>FY 2024</u> <u>OCO</u>	<u>FY 2024</u> <u>Total</u>	<u>FY 2025</u>	<u>FY 2026</u>	<u>FY 2027</u>	<u>FY 2028</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
• PT4: <i>Protect (ACD&P)</i>	-	175.219	179.158	-	179.158	135.096	107.341	123.538	139.376	Continuing	Continuing

Remarks

D. Acquisition Strategy

N/A

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Chemical and Biological Defense Program **Date:** March 2023

Appropriation/Budget Activity 0400 / 3	R-1 Program Element (Number/Name) PE 0603384BP / <i>Chemical and Biological Defense Program - Advanced Development</i>	Project (Number/Name) MT3 / <i>Mitigate (ATD)</i>
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COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
MT3: <i>Mitigate (ATD)</i>	-	0.000	86.157	100.791	0.000	100.791	89.511	91.704	85.795	85.480	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Mitigate Advanced Technology Development (ATD) Project provides the Joint Force the ability to preserve combat power by mitigating exposure to chemical and biological (CB) hazards and restoring combat readiness of critical personnel and platforms. In FY 2023, the Chemical Biological Defense Program (CBDP) RDT&E Projects were restructured to align with the CBDP portfolio construct. MT3 efforts in FY 2022 remain in Projects CB3 and TM3. This restructuring provided standardization and alignment across CBDP research, development and acquisition efforts.

Thrust Areas included in this Project are:

- (1) Biological Warfare Defense Therapeutics
- (2) Discovery of Medical Countermeasures Against New and Emerging (DOMANE)
- (3) Chemical Reactive Ocular Wound and Dermal Therapeutics (CROWD)
- (4) Emerging and Pharmaceutical-based Agent Threats (EMPATH)
- (5) Reactivators of Acetylcholinesterase as Therapeutics (ReACT)
- (6) Enhanced Survivability Coatings
- (7) Equipment Decontamination
- (8) Multifunctional Materials for Protection
- (9) Personnel Decontamination
- (10) Wide Area Decontamination

Biological Warfare Defense Therapeutics: Develops broad-spectrum bacterial, toxin and viral therapeutics, and label expansion (repurposing) of medical countermeasures that are Food and Drug Administration (FDA) approved or in advanced stages of clinical development. These efforts are coordinated with Department of Health and Human Services (HHS), Biomedical Advanced Research and Development Authority (BARDA), and across the interagency and Department, to leverage public and force/defense health related investments made to minimize risk and speed approval of novel antibiotic countermeasures. Efforts include additional investments in enhanced biodefense and pandemic preparedness.

Discovery of Medical Countermeasures Against New and Emerging threats (DOMANE): Provides innovative and rapid medical countermeasures (MCMs) development capabilities that reduce developmental risks, cost and schedule associated with MCM fielding, and afford protection against and allow the Joint Force to rapidly respond to traditional, new and emerging biological warfare threat exposures to allow freedom of action. Efforts include additional investments in enhanced biodefense and pandemic preparedness.

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Chemical and Biological Defense Program	Date: March 2023
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Appropriation/Budget Activity 0400 / 3	R-1 Program Element (Number/Name) PE 0603384BP / <i>Chemical and Biological Defense Program - Advanced Development</i>	Project (Number/Name) MT3 / <i>Mitigate (ATD)</i>
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Chemically Reactive Ocular Wound and Dermal Therapeutics (CROWD): Develop a fielded medical countermeasure for the Warfighter that can treat a chemical agent that has breached the skin. Collect the data that the Food and Drug Administration (FDA) will require for approval.

Emerging and Pharmaceutical-based Agent Threats (EMPATH): Assess candidate MCMs (Medical Countermeasures) for development into fieldable drug products. Activities focus on assessing current therapeutic drugs for protection against opioid agents and developing MCMs to treat non-opioid sedatives.

Reactivators of Acetylcholinesterase (AChE) as Therapeutics (ReACT): Develops broad-spectrum, centrally-acting acetylcholinesterase (AChE) reactivators, that increase survival, reduce morbidity, and decrease neurological damage. Two advanced lead candidates are in development.

Enhanced Survivability Coatings: Addresses military equipment coating ease of decontamination and resistance to chemical agent penetration. Projects will develop temporary coatings that resist chemical agent absorption and are quickly decontaminated in the field and allow the rapid regeneration of combat power.

Equipment Decontamination: Develops decontaminant formulations and procedures that reduce or eliminate residual contamination hazards; enables unit-level decontamination with rapid unmasking; reduces logistic needs, enables rapid sorting of clean from dirty to return high-value equipment to normal use, and develops improved realistic test methods. Efforts address the capability to decontaminate personal equipment. Efforts include additional investments in enhanced biodefense and pandemic preparedness.

Multifunctional Materials for Protection: Discovers, develops and integrates novel, reactive/catalytic materials and scale material manufacturing with maximum sorption and reactivity, and characterize materials using state-of-the-art in operando and ambient pressure spectroscopies, for eventual integration into next generation decontaminants that reactively decontaminate chemical warfare agents.

Personnel Decontamination: Develops personnel decontaminants with lower lifecycle costs and storage constraints and determines time, efficacy, and logistics burdens to Warfighters for mass casualty decontamination, including possible substitutions for current approved personnel decontamination formulations.

Wide Area Decontamination: Addresses limited capabilities to rapidly restore critical DoD infrastructure (e.g., sea port or air base) and mitigate contamination spread to enable normal, unprotected operations. Efforts seek to improve contamination mitigation logistics/cost reduction, effectiveness, compatibility/safety, and environmental compatibility. Efforts support autonomous critical area biological decontamination systems. Efforts include additional investments in enhanced biodefense and pandemic preparedness.

B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2022	FY 2023	FY 2024
Title: 1) Biological Warfare Defense Therapeutics	-	29.439	29.703
FY 2023 Plans: Bacterial: - Continue efforts to identify and advance bacterial therapeutic candidates, with a focus on non-traditional candidates. Therapeutic candidates that are shown to be both safe and efficacious against Biological Warfare (BW) threats will advance			

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Chemical and Biological Defense Program		Date: March 2023
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B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2022	FY 2023	FY 2024
<p>for additional nonclinical and clinical evaluation under Advanced Component Development and Prototypes (PE 0603884BP) or transition to an advanced developer.</p> <ul style="list-style-type: none"> - Continue to partner with interagency, international and industry partners to fund nonclinical BW therapeutic efficacy studies for therapeutic candidates already in advanced development for public and force health indications. - Continue to execute proof of concept efficacy studies for antibiotic therapy in combination with prophylaxis or complimentary treatments (layered medical defense). Advance layered combinations toward proof of concept in non-human primate (NHP) models. <p>Viral:</p> <ul style="list-style-type: none"> - Continue efforts to identify and advance viral therapeutic candidates against new and existing BW viral threats, including direct acting, broad-spectrum anti-virals and monoclonal antibodies. Therapeutic candidates that are shown to be both safe and efficacious against BW threats will advance for additional nonclinical and clinical evaluation under Advanced Component Development and Prototypes (PE 0603884BP) or transition to an advanced developer. - Continue proof of concept viral therapeutic efficacy studies for combinations of therapeutics including, small molecule, monoclonal antibody and host-directed therapeutics. <p>Toxins:</p> <ul style="list-style-type: none"> - Continue to evaluate efficacy of repurposed drug for treatment of botulinum neurotoxin (BoNT) A intoxication in NHP animal model. <p>FY 2024 Plans:</p> <p>Bacterial:</p> <ul style="list-style-type: none"> - Continue efforts to identify and advance bacterial therapeutic candidates, including non-traditional candidates. Therapeutic candidates that are shown to be both safe and efficacious against BW threats will advance for additional nonclinical and clinical evaluation or transition to other therapeutic efforts or an advanced developer. Two broad-spectrum therapeutic candidates will advance to the Department of Health and Human Services, Biomedical Advanced Research and Development Authority for continued development. - Continue to partner with interagency, international and industry partners to fund nonclinical BW therapeutic efficacy studies for therapeutic candidates already in advanced development for public and force health indications. - Continue to execute proof of concept efficacy studies for antibiotic therapy in combination with prophylaxis or complimentary treatments (layered medical defense). Advance layered combinations toward proof of concept in non-human primate (NHP) models. <p>Viral:</p>			

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Chemical and Biological Defense Program		Date: March 2023		
Appropriation/Budget Activity 0400 / 3	R-1 Program Element (Number/Name) PE 0603384BP / <i>Chemical and Biological Defense Program - Advanced Development</i>	Project (Number/Name) MT3 / <i>Mitigate (ATD)</i>		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2022	FY 2023	FY 2024
<p>- Continue efforts to identify and advance viral therapeutic candidates against new and existing BW viral threats, including host targeted and direct acting, broad-spectrum anti-virals and monoclonal antibodies. Therapeutic candidates that are shown to be both safe and efficacious against BW threats will advance for additional nonclinical and clinical evaluation or transition to other therapeutic efforts or an advanced developer. One broad-spectrum therapeutic candidate will advance to the Joint Program Executive Office for Chemical, Biological, Radiological and Nuclear Defense Antiviral Oral Therapeutic Program for continued development.</p> <p>- Continue proof of concept viral therapeutic efficacy studies for combinations of therapeutics including, small molecule, monoclonal antibody and host-directed therapeutics.</p> <p>FY 2023 to FY 2024 Increase/Decrease Statement: Minor change due to routine program adjustments.</p>				
<p>Title: 2) Biological Warfare Defense Therapeutics - Enhanced Biodefense (ENBD)</p> <p>Description: This effort focuses on Drug Repurposing; Micro physiological Systems; Small Molecule Libraries; and Science & Technology Host Response Studies. Activities include expediting a response to emerging threats by assessing broad-spectrum efficacy of approved drugs against biological threats (i.e., drug repurposing), advancing repurposed drugs against biological threats for U.S. Food & Drug Administration (FDA) approval; developing tools (e.g., small molecule libraries) to expedite discovery and development of therapeutic candidates in response to an emerging threat; and, identifying and developing technologies that target host response to disease caused by biological threats.</p> <p>FY 2023 Plans:</p> <ul style="list-style-type: none"> - Initiate and accelerate projects to repurpose broad-spectrum drugs against viral, bacterial and toxin threats. - Initiate and continue projects to create and sustain curated, searchable databases of molecules with toxicity, drug development and efficacy data for use in a response to emerging biological threats. - Initiate development of host-targeted technologies that can be used to stop progression of disease caused by viral threats. <p>FY 2024 Plans:</p> <ul style="list-style-type: none"> - Continue to repurpose broad-spectrum drugs against viral, bacterial and toxin threats. - Continue to create and sustain curated, searchable databases of molecules with toxicity, drug development and efficacy data for use in a response to emerging biological threats. - Continue to develop host-targeted technologies that can be used to stop progression of disease caused by viral threats. 		-	23.000	23.000
Title: 3) Biological Warfare Defense Therapeutics		-	-	3.984

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Chemical and Biological Defense Program		Date: March 2023
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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2022	FY 2023	FY 2024
<p>Description: Funds biomedical research focused on the nonclinical and early clinical development of therapeutic countermeasures against known and emerging viral, bacterial, and toxin biological warfare (BW) threats for which U.S. Food & Drug Administration (FDA) approved therapeutics are limited or lacking. BW defense therapeutics mitigate and reverse the effects of known and emerging viral, bacterial, and toxin biological warfare threats in symptomatic warfighters diagnosed with BW disease. They are the last line of defense against BW threats and are critical to returning symptomatic warfighters to service. Biomedical research is focused on nonclinical development (e.g., animal model, and formulation/manufacturing studies) and early clinical evaluation of broad-spectrum therapeutic candidates that target viruses, bacteria or toxins directly, enhance the host response (e.g., by modulating the immune system) and/or relieve BW disease symptoms. Therapeutic candidates that are shown to be both safe and efficacious against BW threats will advance for further non-clinical and/or clinical evaluation under RDT&E budget activity 5, and can be accelerated for use against emerging infectious diseases during an outbreak. Clinical and nonclinical evaluation of novel small molecules (chemically synthesized), novel biologic molecules (isolated from natural sources), drug and drug/vaccine combinations (aka layered defense), and repurposing of drugs approved by the FDA or in clinical development for other indications, are included in this research. Refinement of appropriate animal models in which to evaluate therapeutic candidates is also included. Projects leverage interagency and commercial sector investments to accelerate development and reduce costs.</p> <p>FY 2024 Plans:</p> <ul style="list-style-type: none"> - Continue nonclinical and regulatory activities to transition broad spectrum antibacterial candidate to Biomedical Advanced Research and Development Authority (BARDA). - Initiate clinical and/or nonclinical studies for broad-spectrum antiviral therapeutic candidates. <p>FY 2023 to FY 2024 Increase/Decrease Statement: Program/project funding transferred from another funding line. FY 2024 funding has been transferred from Project PT4 for better alignment under budget activity 3.</p>			
<p>Title: 4) Discovery of Medical Countermeasures Against New and Emerging (DOMANE)</p> <p>Description: This effort focuses on predicting pathogenesis of pathogens and toxins while using artificial intelligence (AI) and machine learning (ML) to identify targets for both host and pathogen while conducting high throughput screens using new structural models with AI to predict and recommend potential therapeutics. It supports DOMANE thrusts like Pathogenesis and Toxicity forecasting using Multi-Organoid Systems (PATMOS) prototype, which develops an advanced-artificial intelligence (AI) assisted multi-organoid system capable of forecasting pathogenesis of viral threats and toxicity of biotoxin threats. It supports DOMANE thrusts like Medical Countermeasure Finder (MEDFIND) to prototype a flexible advanced AI-assisted system capable of harnessing repurposed drugs and generate effective therapeutic intervention strategies against viral and biotoxin threats.</p>	-	3.403	7.469

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Chemical and Biological Defense Program		Date: March 2023
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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2022	FY 2023	FY 2024
<p>FY 2023 Plans:</p> <ul style="list-style-type: none"> - Continued development of prototype capability that forecasts pathogenicity or toxicity of biological threats. - Continued development of prototype capability for high-throughput screening to produce high resolution target and MCM identification. <p>FY 2024 Plans:</p> <ul style="list-style-type: none"> - Continue prototype development of PATMOS platform for high resolution forecasting of pathogenesis that occurs during interaction of new and emerging biological threats and providing initial safety data on recommended medical countermeasures. - Continue development of prototype development of ambient ionization mass spectroscopy high-throughput screens (AIM-HITS) system to rapidly characterize MCMs by collecting and analyzing large amounts of structural data and use AI/ML to recommend new MCMs. <p>FY 2023 to FY 2024 Increase/Decrease Statement: Increase due to change in program/project technical parameters.</p>			
<p>Title: 5) Discovery of Medical Countermeasures Against New and Emerging (DOMANE) - Enhanced Biodefense (ENBD)</p> <p>Description: This effort focuses on predicting pathogenesis of pathogens and toxins while using artificial intelligence (AI) and machine learning (ML) to identify targets for both host and pathogen while conducting high throughput screens using new structural models with AI to predict and recommend potential therapeutics. It supports DOMANE thrusts like Pathogenesis and Toxicity forecasting using Multi-Organoid Systems (PATMOS) prototype, which develops an advanced- AI assisted multi-organoid system capable of forecasting pathogenesis of viral threats and toxicity of biotoxin threats. It supports other DOMANE thrusts like Medical Countermeasure Finder (MEDFIND) to prototype a flexible advanced AI-assisted system capable of harnessing repurposed drugs and generate effective therapeutic intervention strategies against viral and biotoxin threats.</p> <p>FY 2023 Plans:</p> <ul style="list-style-type: none"> - Prototype development PATMOS platform for high resolution forecasting of pathogenesis that occurs during interaction of a biological threat. - Prototype initiation for MEDFIND platform to identify repurposed drugs using AI and Machine Learning (ML). <p>FY 2024 Plans:</p> <ul style="list-style-type: none"> - Continue prototype development of PATMOS platform for high resolution forecasting of pathogenesis using organoid platforms that occurs during interaction of new and emerging biological threats. - Initiate 2nd PATMOS prototype to provide additional pathogenesis forecasting capability along with recommending MCMs for treatment. 	-	12.000	12.000

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Chemical and Biological Defense Program		Date: March 2023
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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2022	FY 2023	FY 2024
<p>-Continued prototype development of ambient ionization mass spectroscopy high-throughput screens (AIM-HITS) system to rapidly characterize MCMs and continued development of cryo-electron microscopy (cyro-em) prototype with high throughput system to characterize MCMs at the atomic level combined with AI/ML to recommend MCMS for new and emerging threats.</p> <p>- Continue prototype development for MEDFIND platform to identify repurposed and new drugs using AI and ML using high throughput screens and micro-electron diffraction to deliver crystal structures on the atomic scale to enable accurate target and host characterization leading to designing new MCMs.</p>			
<p>Title: 6) Chemical Reactive Ocular Wound and Dermal Therapeutics (CROWD)</p> <p>Description: Focuses on therapeutic strategies to effectively treat Chemical Warfare Agents (CWA) contamination on wounds, eyes, and large areas of intact skin. This effort involves the development of products capable of removing or neutralizing CWA from those routes of exposure, to decrease the toxic load of agent and allow optimal effectiveness of other systemic therapeutics.</p> <p>FY 2023 Plans:</p> <ul style="list-style-type: none"> - Submit investigational new drug (IND) submission to the FDA for organophosphorus nerve agents (OPNA) catalytic scavenger enzymes. - Complete Good Laboratory Practice (GLP) pharmacokinetics, immunogenicity and efficacy of catalytic scavenger enzyme lead candidates in small animals. - Complete enzyme current Good Manufacturing Practice (cGMP) manufacturing scale-up. - Complete formulation efforts. - Complete enzyme non-cGMP manufacturing scale-up. <p>FY 2024 Plans:</p> <ul style="list-style-type: none"> - Perform advanced preclinical studies to validate safety and efficacy in support of clinical trials. <p>FY 2023 to FY 2024 Increase/Decrease Statement: Increase due to change in program/project technical parameters.</p>	-	1.174	2.500
<p>Title: 7) Emerging and Pharmaceutical-based Agent Threats (EMPATH)</p> <p>Description: Focus on therapeutic and proactive strategies to effectively minimize injuries and/or death resulting from exposure to Pharmaceutical Based Agents (PBA). This will allow the warfighter to maintain operational capacity in a chemically contested battlefield scenario. This effort involves the evaluation U.S. Food & Drug Administration (FDA) approved therapeutics for operational use, as well as generation of novel drug products to enhance level of protection and/or operational utility for the warfighter. Efforts in this area are designed to develop drug candidates that will ultimately be submitted for FDA licensure or to identify previously licensed products for new uses in the treatment and pretreatment against chemical warfare injury.</p> <p>FY 2023 Plans:</p>	-	1.463	4.361

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Chemical and Biological Defense Program		Date: March 2023		
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B. Accomplishments/Planned Programs (\$ in Millions)		FY 2022	FY 2023	FY 2024
<ul style="list-style-type: none"> - Continue operational assessment of FDA approved drug products to inform MCM timing and sequence in the event of a known or unknown chemical exposure. - Assess operational feasibility of employing FDA approved opioid antagonist MCM to provide extended duration of protection. <p>FY 2024 Plans:</p> <ul style="list-style-type: none"> - Continue cGMP production and non-GLP/GLP safety and/or efficacy assessment of a novel, multi-dose vialled formulation. - IND filing and initiation of a human bioavailability/bioequivalence study to support an New Drug Application (NDA) filing for a novel, multi-dose vialled formulation. <p>FY 2023 to FY 2024 Increase/Decrease Statement: Increase due to fact of life change in the program/project.</p>				
<p>Title: 8) Reactivators of AChE as Therapeutics (ReACT)</p> <p>Description: The Warfighter requires rapid acting MCMs to counter adverse effects from exposure to Nerve Agents (NAs) and maintain force lethality. This effort involves the development of improved therapies for acetylcholinesterase enzyme reactivation. Efforts in this area are focused on formulation development and pre-clinical studies for potential candidates that will ultimately be submitted for FDA licensure or previously licensed products for new uses in the treatment of chemical warfare casualties.</p> <p>FY 2023 Plans:</p> <ul style="list-style-type: none"> - Continue to advance pre-clinical development of lead therapeutic candidates. - Continue formulation efforts and scale up manufacturing for lead therapeutic candidates. - Initiate GLP toxicology and long-term stability studies for lead therapeutic candidates. <p>FY 2024 Plans:</p> <ul style="list-style-type: none"> - Continue to advance pre-clinical development of lead therapeutic candidates. - Complete IND-enabling studies on the current lead reactivator candidates. - Continue development efforts in preparation for IND/phase 1 clinical trials, including cGMP manufacturing. <p>FY 2023 to FY 2024 Increase/Decrease Statement: Increase due to change in program/project technical parameters. FY 2024 funding has been transferred from Project MT4 for better alignment under budget activity 3.</p>		-	3.618	8.205
<p>Title: 9) Enhanced Survivability Coatings</p> <p>Description: Efforts seek to produce enhanced coatings that increase chemical warfare agent survivability and decontaminability of military materiel to levels comparable to that of stainless steel. Improved coatings will resist chemical agent absorption and be quickly decontaminated in field, to rapidly return materiel to unprotected mission operations level.</p>		-	0.051	0.074

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Chemical and Biological Defense Program		Date: March 2023
Appropriation/Budget Activity 0400 / 3	R-1 Program Element (Number/Name) PE 0603384BP / <i>Chemical and Biological Defense Program - Advanced Development</i>	Project (Number/Name) MT3 / <i>Mitigate (ATD)</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2022	FY 2023	FY 2024
<p>FY 2023 Plans:</p> <ul style="list-style-type: none"> - Continue to characterize bio-inspired surface treatments for equipment coatings to repel agents of interest from current military equipment coatings. - Evaluate and incorporate new or commercially-available appliques (to include chemical transport studies in current military coatings, novel coatings characterization, thin film overcoats, strippable coat, reactive coat, and lock-down coats) in support of CBRN Coatings, Coverings, and Protective Overlays. - Advance thin repellent film coating systems from fundamental research to applied research test and evaluation. <p>FY 2024 Plans:</p> <ul style="list-style-type: none"> - Transition candidate temporary overcoats that are commercially-available, improve success of decontamination, have low impact on signature, and reduce logistics to the Tactical Temporary Coatings (TTC) program of record. - Continue to evaluate and demonstrate industry polymer coatings as potential temporary or permanent military equipment coatings to decrease logistical burden of decontamination. <p>FY 2023 to FY 2024 Increase/Decrease Statement: Minor change due to routine program adjustments.</p>			
<p>Title: 10) Equipment Decontamination</p> <p>Description: This effort seeks to develop decontaminant formulations and procedures that reduce or eliminate residual contamination hazards; enable unit-level decontamination with rapid unmasking; reduce logistic needs (need for water); enable rapid sorting of clean from dirty to rapidly return high-value equipment to normal use; and develop improved realistic test methods. Successful efforts will result in improved efficacy, materials compatibility, flexibility, and reduced logistical burden compared to existing and emerging decontamination program requirements.</p> <p>FY 2023 Plans:</p> <ul style="list-style-type: none"> - Transition methodology for testing for effective decontamination of complex surfaces and real-world systems to the Service Equipment Decontamination Systems (SEDS) or Tactical Contamination Mitigation Systems (TCMS) programs of record. - Finish development and demonstration of an autonomous decontamination platform to reduce troop-to-task burden of operational decontamination. <p>FY 2024 Plans:</p> <ul style="list-style-type: none"> - Demonstrate autonomous equipment decontamination platform to reduce troop-to-task and logistics requirements for operational decontamination. - Transition methodology for decontaminating chemically-contaminated sensitive equipment using hot, humid air. 	-	0.951	0.454

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Chemical and Biological Defense Program		Date: March 2023		
Appropriation/Budget Activity 0400 / 3	R-1 Program Element (Number/Name) PE 0603384BP / <i>Chemical and Biological Defense Program - Advanced Development</i>	Project (Number/Name) MT3 / <i>Mitigate (ATD)</i>		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2022	FY 2023	FY 2024
- Transition methodology for decontaminating bacterial spore-contaminated aircraft using hot, humid air.				
<p>FY 2023 to FY 2024 Increase/Decrease Statement: Decrease due to transition of hot air decontamination technologies to Joint Biological Aircraft Decontamination System and Service Equipment Decontamination Systems programs of record in early FY24.</p>				
<p>Title: 11) Multifunctional Materials for Protection</p> <p>Description: This effort will discover, develop and integrate novel, reactive/catalytic materials and scale material manufacturing with maximum sorption and reactivity, and characterize materials using state-of-the-art in operando and ambient pressure spectroscopies, for eventual integration into next generation decontaminants and coatings.</p> <p>FY 2023 Plans: - Develop and characterize novel reactive/catalytic materials that decontaminate chemical and biological (CB) threats and integrate materials into next generation decontaminants and coatings.</p> <p>FY 2024 Plans: - Integrate reactive materials into decontamination systems for enhanced threat spectrum mitigation. - Continue ambient pressure characterization of reactive chemical decontamination mechanisms. - Scale materials manufacturing processes for cost-efficiency and characterize materials using operationally-relevant conditions.</p> <p>FY 2023 to FY 2024 Increase/Decrease Statement: Minor change due to routine program adjustments.</p>		-	0.189	0.117
<p>Title: 12) Personnel Decontamination</p> <p>Description: This effort develops decontaminants for decontamination of unbroken skin with lower lifecycle costs and storage constraints and determination of time, efficacy and logistics burdens to warfighters for mass casualty decontamination. Decrease warfighter burden in the event of a chemical warfare agent (CWA) exposure by identifying S&T gaps in the mass personnel decontamination process as well as possible substitutions for current approved personnel decontamination formulations.</p> <p>FY 2023 Plans: - Develop and use laboratory and animal models to assess physical removal technologies for potential replacement of Reactive Skin Decontamination Lotion (RSDL). - Continue to integrate new dry decontamination into a mitt form factor and determine S&T challenges within process and procedure improvements. This includes investigation of Food and Drug Administration (FDA) requirements for approval of technology as a medical device.</p> <p>FY 2024 Plans:</p>		-	0.869	2.339

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Chemical and Biological Defense Program		Date: March 2023		
Appropriation/Budget Activity 0400 / 3	R-1 Program Element (Number/Name) PE 0603384BP / <i>Chemical and Biological Defense Program - Advanced Development</i>	Project (Number/Name) MT3 / <i>Mitigate (ATD)</i>		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2022	FY 2023	FY 2024
<p>- Prepare a medical device package for FDA consideration for a new personnel decontamination form factor that reduces sustainment risk of Reactive Skin Decontamination Lotion cold storage and shelf-life concerns for the next generation Medical Decontamination Personnel Skin program of record.</p> <p>FY 2023 to FY 2024 Increase/Decrease Statement: Increase due to accelerated development effort.</p>				
<p>Title: 13) Wide Area Decontamination</p> <p>Description: Develop processes and identify chemicals to decontaminate critical DoD infrastructure (e.g., sea port or air base) and mitigate contamination spread to enable normal, unprotected operations. Examine commercial bulk packaged chemicals as potential wide area decontaminants and barriers to improve chemical wide area decontamination and improve logistics (i.e., effectiveness in mitigating contamination; compatibility/safety, environmentally friendly; cost reduction).</p> <p>FY 2024 Plans: -Optimize chemical wide area decontamination methods and processes for using commercially-available packaged chemicals for decontaminating critical infrastructure area surfaces for effectiveness, availability, and sprayability/scalability. -Demonstrate chemical wide area decontamination methods, processes, and feasibility for using commercially-available packaged chemicals using operationally-relevant environments and simulants in support of autonomous decontamination.</p> <p>FY 2023 to FY 2024 Increase/Decrease Statement: Funding transferred from Equipment Decontamination thrust.</p>		-	-	0.585
<p>Title: 14) Equipment Decontamination - Enhanced Biodefense (ENBD)</p> <p>Description: This effort will focus on Improved Decontamination and Disinfectant Options. The Warfighter has a limited capability to decontaminate personal equipment, weapons, vehicles, ships, and facilities; Sensitive equipment (weapon system optics, electronic equipment, interior spaces, and aircraft); and hazardous waste. Efforts seek to develop decontaminant formulations and procedures that reduce or eliminate residual contamination hazards; enable unit-level decontamination with rapid unmasking; reduce logistic needs (need for water); enable rapid sorting of clean from dirty to rapidly return high-value equipment to normal use; and develop improved realistic test methods. Successful efforts will result in improved efficacy, materials compatibility, flexibility, and reduced logistical burden compared to existing and emerging decontamination program requirements.</p> <p>FY 2023 Plans: - Develop and demonstrate biological disinfection guidelines, procedures, and Concepts of Operations (CONOPs) for Department of Defense (DoD) facility and large-platform interiors, including development of directed energy disinfection methods including plasma and ultraviolet germicidal irradiation.</p>		-	5.000	5.000

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Chemical and Biological Defense Program **Date:** March 2023

Appropriation/Budget Activity 0400 / 3	R-1 Program Element (Number/Name) PE 0603384BP / <i>Chemical and Biological Defense Program - Advanced Development</i>	Project (Number/Name) MT3 / <i>Mitigate (ATD)</i>
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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2022	FY 2023		FY 2024
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<ul style="list-style-type: none"> - Complete comparative laboratory study of Biosafety Level (BSL)-1 surrogate and BSL-2 human coronavirus ultraviolet (UV) disinfection to support field demonstrations. - Develop biological agent disclosure sprays for sensitive, specific biological contamination mapping on surfaces to guide and reduce logistics of decontamination. Explore solution concepts through research, development, and demonstration of one or more functional prototype technologies in a phased approach for a biological agent disclosure spray. - Demonstrate a proof of concept demonstrating specific recognition and binding of the targeted biological warfare agent of interest. <p>FY 2024 Plans:</p> <ul style="list-style-type: none"> - Complete and transition methods for field testing of surface decontamination methods for viruses using a safe, non-infectious surrogate to the Joint Biological Aircraft Decontamination Systems program of record. - Continue development of biological disinfection guidelines, procedures, and CONOPs, for DoD facility and large-platform interiors, including directed energy decontamination approaches. - Optimize and verify laboratory methods for biological agent disclosure sprays for sensitive, specific biological contamination mapping on surfaces to guide and reduce logistics of decontamination. 				
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<p>Title: 15) Wide Area Decontamination - Enhanced Biodefense (ENBD)</p> <p>Description: This effort focuses on developing an autonomous decontamination platform to decontaminate critical DoD infrastructure (e.g., sea port or air base) and mitigate biological contamination spread to enable normal, unprotected operations. Examines commercial packaged chemicals as potential wide area decontaminants and barriers to improve biological wide area decontamination and improve logistics (i.e., effectiveness in mitigating contamination; compatibility/safety, environmentally friendly; cost reduction).</p> <p>FY 2024 Plans: Develop concept platform and required subsystems for autonomous wide area biological decontamination, methods, processes, and feasibility and identify and optimize biological decontaminant formulations.</p> <p>FY 2023 to FY 2024 Increase/Decrease Statement: Funding transferred from Equipment Decontamination - Enhanced Biodefense thrust area. Increase supports biological autonomous wide area decontamination project in FY24.</p>	-	-		1.000
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Accomplishments/Planned Programs Subtotals	-	81.157		100.791
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	FY 2022	FY 2023	
Congressional Add: Broad Spectrum Small Molecule Anti-viral Development	-	5.000	

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Chemical and Biological Defense Program **Date:** March 2023

Appropriation/Budget Activity 0400 / 3	R-1 Program Element (Number/Name) PE 0603384BP / <i>Chemical and Biological Defense Program - Advanced Development</i>	Project (Number/Name) MT3 / <i>Mitigate (ATD)</i>
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	FY 2022	FY 2023
FY 2023 Plans: Viral: - Enhance viral therapeutic development pipeline by initiating one to two new efforts to identify and advance broad-spectrum viral therapeutic candidates against new and existing biological warfare (BW) viral threats. Therapeutic candidates that are shown to be both safe and efficacious against BW threats will advance for additional nonclinical and clinical evaluation under Advanced Component Development and Prototypes (PE 0603884BP) or transition to an advanced developer.		
Congressional Adds Subtotals	-	5.000

C. Other Program Funding Summary (\$ in Millions)

<u>Line Item</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u> <u>Base</u>	<u>FY 2024</u> <u>OCO</u>	<u>FY 2024</u> <u>Total</u>	<u>FY 2025</u>	<u>FY 2026</u>	<u>FY 2027</u>	<u>FY 2028</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
• MT4: <i>Mitigate (ACD&P)</i>	-	17.302	28.785	-	28.785	20.885	15.433	13.369	-	Continuing	Continuing

Remarks

D. Acquisition Strategy

N/A

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Chemical and Biological Defense Program										Date: March 2023		
Appropriation/Budget Activity 0400 / 3					R-1 Program Element (Number/Name) PE 0603384BP / <i>Chemical and Biological Defense Program - Advanced Development</i>				Project (Number/Name) EN3 / <i>Enabling Investments (ATD)</i>			
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
EN3: <i>Enabling Investments (ATD)</i>	-	0.000	39.540	43.196	0.000	43.196	43.198	44.449	44.449	44.449	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Enabling Investments Advanced Technology Development (ATD) Project focuses on early and continued involvement of the Warfighter in the technology development process and has implemented a user community engagement process to align science and technology (S&T) activities with operational needs and ensure functional design. This process begins with the identification of an innovative technology concept, continues through the assessment of the prototype, and ends at the operational and utility demonstrations to enhance transition to an advanced developer. Enabling efforts in this area support dedicated infrastructure capabilities, demonstrations, and overarching development support functions as portfolio enablers responding to emerging threats. In FY 2023, the Chemical Biological Defense Program (CBDP) RDT&E Projects were restructured to align with the CBDP portfolio construct. EN3 efforts in FY 2022 remain in Projects TM3 and TT3. This restructuring provided standardization and alignment across CBDP research, development and acquisition efforts.

Thrust Areas included in this Project are:

- (1) Battlefield Readiness
- (2) Diagnostic Building Blocks
- (3) Emerging Threats
- (4) Medical Countermeasures Initiative
- (5) Advanced Technology Demonstration (ATD)
- (6) Technology Concept
- (7) User Assessment

Battlefield Readiness: Provides innovative capabilities to the warfighter that increase the speed of relevancy, enhance troop preparedness, aid with triage support, and provides diagnosis at lower roles of care. Develops field forward medical diagnostics to provide multiplexed detection of biological and toxin threats and leverages immunodiagnostics to identify specific targets using current or novel approaches to enable broader and more accurate diagnosis for a range of targets and across a wider window following exposure. Efforts include additional investments in Chem Bio Incident Preparedness and Response.

Diagnostic Building Blocks: Develops foundational capabilities for the entire diagnostics portfolio; invests in innovative, cutting-edge technologies to improve the development pipeline for diagnostics; and exploits areas in artificial intelligence synthetic biology and machine learning to develop novel and rapid diagnostic tests for utilization. Efforts accelerate assay development timelines and optimize test parameters by leveraging novel concepts and tools that readily allow a pivot to assay development for emerging threats. Efforts include additional investments in Chem Bio Incident Preparedness and Response.

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Chemical and Biological Defense Program	Date: March 2023
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Appropriation/Budget Activity 0400 / 3	R-1 Program Element (Number/Name) PE 0603384BP / <i>Chemical and Biological Defense Program - Advanced Development</i>	Project (Number/Name) EN3 / <i>Enabling Investments (ATD)</i>
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Emerging Threats: Invests in diagnostic tests that enable the delivery of actionable information, such as administering the appropriate medical countermeasure, to greatly advance efficacy rates and turnaround time for Warfighter wellness. Efforts focus on better preparing for surprise by developing diagnostic systems that leverage novel approaches to characterize pathogens or host response and can identify the classification of threat (e.g., bacterial vs viral) from an unknown sample. Efforts include additional investments in Chem Bio Incident Preparedness and Response.

Medical Countermeasures Initiative: Advances medical capabilities to support CB Incident Preparedness and Response (CBIPR). Efforts focus on vaccine platform capability development; novel encapsulation and delivery strategies that optimally tune the immune response to provide greater protection from a vaccine as well as laboratory sustainment for the Animal Model/Response Capability; genomics; and other medical countermeasure development through antimicrobial susceptibility projects.

ATD: Execution of the ATD campaign plan across the Future Years Defense Program (FYDP) will close the identified gaps by conducting dynamic mission-oriented, scenario based, threat relevant integrated capability demonstrations with Warfighters employing innovative, mature and optimized S&T technologies.

Technology Concept: Validates technology requirements and scopes future S&T programs with the User community early in technology development process. Results from these experiments shape operating concepts, doctrine, and materiel systems requirements for the future Joint Force and informs the utility of emerging technologies for subsequent portfolio investment decisions. Technology Concept outcomes explore new concepts of employment for emerging capabilities to shift the current operational paradigm.

User Assessment: Execution of the User Assessments provide dynamic mission-based scenarios, exercises and field experiments to close identified gaps and can expedite technology development as well as ensure transition and fielding success.

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2022	FY 2023	FY 2024
<p>Title: 1) Battlefield Readiness</p> <p>Description: Provide innovative capabilities to the Warfighter that increase the speed of relevancy, enhance troop preparedness, aid with triage support, and provide diagnosis at lower roles of care. Develop field forward medical diagnostics that allow for multiplexed detection of biological and toxin threats. Leverage immunodiagnostics to identify specific targets using current or novel approaches to enable broader and more accurate diagnosis for a range of targets and across a wider window following exposure. These funds support CB Incidence Preparedness Response (CBIPR).</p> <p>FY 2023 Plans:</p> <ul style="list-style-type: none"> - Continue the development of additional panels for infectious disease diagnostic tests on the immunological diagnostic platform. <p>FY 2024 Plans:</p> <ul style="list-style-type: none"> - Continue the development of additional panels for infectious disease diagnostic tests on the immunological diagnostic platform. <p>FY 2023 to FY 2024 Increase/Decrease Statement:</p>	-	5.094	4.658

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Chemical and Biological Defense Program		Date: March 2023
Appropriation/Budget Activity 0400 / 3	R-1 Program Element (Number/Name) PE 0603384BP / <i>Chemical and Biological Defense Program - Advanced Development</i>	Project (Number/Name) EN3 / <i>Enabling Investments (ATD)</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2022	FY 2023	FY 2024
Minor change due to routine program adjustments.			
<p>Title: 2) Diagnostic Building Blocks</p> <p>Description: Lays a foundation for the entire diagnostics portfolio by exploiting areas such as machine learning (ML), synthetic biology and chemistry to develop novel and rapid diagnostic tests for utilization in the event of an outbreak of an unknown threat. These funds support CB Incidence Preparedness Response (CBIPR).</p> <p>FY 2023 Plans: - Continue novel efforts in Artificial Intelligence (AI) and ML for designing assays with high specificity against a broader range of CB agents to enable an agile response to emerging threats.</p> <p>FY 2024 Plans: - Continue novel efforts utilizing AI and ML for designing assays with high specificity against a broader range of chemical and biological agents to enable an agile response to emerging threats.</p> <p>FY 2023 to FY 2024 Increase/Decrease Statement: Minor change due to routine program adjustments.</p>	-	3.962	4.075
<p>Title: 3) Emerging Threats</p> <p>Description: Advance the diagnosis of emerging and/or low prevalence but high threat biological agents leveraging novel technologies. Develop threat agnostic tests based on host biomarkers that identify known or emerging bacterial or viral infections. Characterize markers for antibiotic resistance or susceptibility to identify challenging threats and inform treatment decisions. Improve capabilities to identify diverse biological agents that are not well characterized using molecular or immunodiagnostic approaches. These funds support CB Incidence Preparedness Response (CBIPR).</p> <p>FY 2023 Plans: - Initiate efforts that establish multiple capabilities for Warfighters to combat new and emerging threats to include identifying novel platforms that are capable of identifying broad classes of threat agents in complex matrices.</p> <p>FY 2024 Plans: - Continue efforts that establish multiple capabilities for Warfighters to combat new and emerging threats to include identifying novel platforms that are capable of identifying broad classes of threat agents in complex matrices.</p> <p>FY 2023 to FY 2024 Increase/Decrease Statement: Increase due to change in program/project technical parameters.</p>	-	2.264	2.912
<p>Title: 4) Medical Countermeasures Initiative</p>	-	19.928	22.261

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Chemical and Biological Defense Program		Date: March 2023
Appropriation/Budget Activity 0400 / 3	R-1 Program Element (Number/Name) PE 0603384BP / <i>Chemical and Biological Defense Program - Advanced Development</i>	Project (Number/Name) EN3 / <i>Enabling Investments (ATD)</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2022	FY 2023	FY 2024
<p>Description: The Chem Bio Incident Preparedness and Response-Medical Countermeasures Initiative (CBIPR-MCMI) will integrate advances in regulatory science, formulation and delivery technologies and processes. Also will develop animal models, drug discovery and evaluation of platforms as enablers of the advanced development of CBDP medical countermeasure products. These initiatives will lead to the establishment of multi-use platforms, novel formulations and animal models that can be leveraged during a CBRN response to accelerate medical product development and/or regulatory approval as well as reduce overall development costs.</p> <p>FY 2023 Plans:</p> <ul style="list-style-type: none"> - Complete preclinical studies for Marburg vesicular stomatitis vaccine (VSV) for initiation into a Phase 1 clinical trial. - Continue Burkholderia outer membrane vesicle (OMV) vaccine manufacturing to support Phase 1 clinical trial. - Conduct good laboratory practice (GLP) toxicology on Burkholderia OMV vaccine prior to entry into Phase 1 clinical trial. - Initiate good manufacturing practice (GMP) manufacturing of Francisella tularensis (FnIglD) vaccine to support Phase 1 clinical trial. - Prepare for surprise by establishing drug discovery and evaluation platform capability that can be leveraged during a CBRN response. - Continue to develop and advance animal models to accelerate medical countermeasure (MCM) delivery and the capacity to respond to emerging biological threats. <p>FY 2024 Plans:</p> <ul style="list-style-type: none"> - Conduct evaluation of immune modulation strategies as stand alone, in layered defense and in formulation with vaccines. - Conduct test and evaluation of encapsulation technologies for vaccines that can co-deliver multiple antigens and adjuvants to specific host tissues and tune the immune response resulting in enhanced antigen efficacy and immediate protection with a single dose. - Conduct test and evaluation of mucosal delivery methods for delivery for vaccines that can fine-tune the immune response to vaccines with the goal being vaccines with neutralizing efficacy against a respiratory exposure to an emerging pathogen. Mucosal delivery has the ability to access unique compartments of immunity through intranasal or oral delivery and target that immunity specifically to the site of infection of a respiratory pathogen. - Prepare for surprise by continuing to establish drug discovery and evaluation platform capability that can be leveraged during a CBRN response. - Continue to develop and advance animal models to accelerate medical countermeasure (MCM) delivery and the capacity to respond to emerging biological threats. <p>FY 2023 to FY 2024 Increase/Decrease Statement:</p>			

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Chemical and Biological Defense Program		Date: March 2023
Appropriation/Budget Activity 0400 / 3	R-1 Program Element (Number/Name) PE 0603384BP / <i>Chemical and Biological Defense Program - Advanced Development</i>	Project (Number/Name) EN3 / <i>Enabling Investments (ATD)</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2022	FY 2023	FY 2024
Increase due to change in program/project schedule.			
<p>Title: 5) Advanced Technology Demonstration</p> <p>Description: Advanced Technology Demonstrations (ATDs) are Joint Task Force (JTF) scenario-based experiments prioritized on warfighter operational needs that demonstrate and evaluate groupings of integrated technologies or prototype systems. Building on the Technology Concepts and User Assessments thrust areas conducted earlier in the technology maturation process, feedback from the Warfighters during ATDs ensures that these technologies are operationally relevant, value added, and can be matured and potentially transitioned in a timely and effective manner to transition partners for advanced development and employment across the spectrum of Joint Force actions in a chemical, biological, radiological, and nuclear (CBRN) defense Environment. ATD outcomes area designed to continue optimizing S&T solutions, demonstrate how maturing technologies can support prioritized operational needs, enhance transition of cutting edge CBRN technologies and mitigate transition risk by demonstrating operational utility.</p> <p>FY 2023 Plans:</p> <ul style="list-style-type: none"> - Plan and execute the first ATD under the Tenacious Dragon Campaign that will demonstrate developmental technologies and gather warfighter feedback on capabilities that enable the effective employment and layering of CBRN awareness, understanding, protection and mitigation capabilities across medical and non-medical portfolios to provide rapid and effective reduction of the operational impact of CBRN hazards. - Leverage the Services' Future Operating Concepts into the scenario development. - Demonstrate technologies from Defense Threat Reduction Agency (DTRA) Technology Divisions to accelerate and optimize their development, maturation, and transition coordinated with other technologies, enhancing capability development and Doctrine, Organization, Training, Materiel, Leadership and education, Personnel, Facilities and Policy (DOTMLPF-P) updates early in the Research & Development (R&D) cycle. - Expand warfighter participation to include a broad spectrum of warfighters from the Services. <p>FY 2024 Plans:</p> <ul style="list-style-type: none"> - Continue Tenacious Dragon Campaign ATD. - Demonstrate developmental technologies and gather warfighter feedback on capabilities that enable the effective employment and layering of CBRN awareness, understanding, protection and mitigation capabilities across medical and non-medical portfolios to provide rapid and effective reduction of the operational impact of CBRN hazards. - Demonstrate novel technologies from Defense Threat Reduction Agency (DTRA) Technology Divisions to accelerate and optimize their development, maturation, and transition coordinated with other technologies, enhancing capability development and DOTMLPF-P updates early in the Research & Development (R&D) cycle. 	-	6.043	5.943

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Chemical and Biological Defense Program		Date: March 2023		
Appropriation/Budget Activity 0400 / 3	R-1 Program Element (Number/Name) PE 0603384BP / <i>Chemical and Biological Defense Program - Advanced Development</i>	Project (Number/Name) EN3 / <i>Enabling Investments (ATD)</i>		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2022	FY 2023	FY 2024
<ul style="list-style-type: none"> - Coordinate an active pathway for developmental technologies from Technology Concepts and User Assessment (e.g. CBOA) thrust areas to ATDs, where appropriate, to demonstrate feedback-based progress in increasingly complex environments and facilitate technology transitions. - Continue the expansion of the service participation to include participation from the Services. <p>FY 2023 to FY 2024 Increase/Decrease Statement: Minor change due to routine program adjustments.</p> <p>Title: 6) Technology Concept</p> <p>Description: Initiatives prior to and during the development of S&T prototypes that “tease out” and confirm operational requirements, explore utility including potential applications among the Services and scope future S&T programs with Warfighter stakeholders, including Combat Developers and Service representatives. Results from these experiments shape Operating Concepts, doctrine, and materiel systems requirements for the future Joint Force and inform technology developers about potential Warfighter utility of emerging technologies and technology concepts for subsequent portfolio investment. Activities in this area focus on Surveys, User Groups, Table Top Exercises (TTXs), and practical demonstration or User feedback workshops to develop Use Cases, desired operational capabilities, key attributes and explore Concepts of Employment to assess feasibility/ utility of emerging technologies and concepts.</p> <p>FY 2023 Plans:</p> <ul style="list-style-type: none"> - Conduct 4-6 technology concept studies, workshops or Focus Groups including the continuation of distributed sensing and mitigation techniques. Additional technology concepts will be identified within this timeframe based upon technology discovery, maturity, and application to Warfighter needs. <p>FY 2024 Plans:</p> <ul style="list-style-type: none"> - Explore select technology concepts from an operational perspective across all capability areas. Tech Concepts explore the utility and application of technological approaches. These include autonomous operations; enhanced biothreat detection; CB threat diagnosis; improvements to sensitivity, specificity, and the limit of detection for CB sensors; features of biosensors to inform therapeutic or medical countermeasure decisions and treatment; next generation respiratory or physical protection; collective protection guidelines and techniques; and coating concepts for porous surfaces. - Continue to conduct User Feedback Tents for Tech Concepts (Concepts Tents) leveraging User community to identify potential areas for improvement and/or employment of emerging technologies. - Continue series of targeted questionnaires/surveys, facilitated focus groups, workshops and TTXs to define use cases, desired operational capabilities, key attributes and concepts of employment that inform tech development and investment strategies, 		-	0.300	1.496

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Chemical and Biological Defense Program		Date: March 2023
Appropriation/Budget Activity 0400 / 3	R-1 Program Element (Number/Name) PE 0603384BP / <i>Chemical and Biological Defense Program - Advanced Development</i>	Project (Number/Name) EN3 / <i>Enabling Investments (ATD)</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2022	FY 2023	FY 2024
Operating Concepts and materiel requirements. Concept Tent reports provide tech recommendations for more detailed Tech Concept studies/experiments.			
<i>FY 2023 to FY 2024 Increase/Decrease Statement:</i> Increase due to change in program/project technical parameters.			
<i>Title:</i> 7) User Assessment	-	1.949	1.851
<i>Description:</i> User Assessments examine maturing technologies and provide opportunities for early Warfighter input into the form, fit, and function of maturing S&T prototypes and technologies; and as appropriate, assess them within a simulated operational environment. The assessments serve as baselines for future ATD programs, and drive S&T gap analysis for key customers and partners. User assessments are characterized by TTXs, Early User Assessments, Technical demonstrations and field experiments that provide candid feedback focused on applicability, utility and recommended improvements while exploring system limitations, vulnerabilities and technology tradeoff analyses of innovative technologies in a non-attributional environment.			
<i>FY 2023 Plans:</i> - Continue the annual CB Operational Analysis (CBOA) event.			
<i>FY 2024 Plans:</i> - Continue the annual CBOA event.			
<i>FY 2023 to FY 2024 Increase/Decrease Statement:</i> Minor change due to routine program adjustments.			
Accomplishments/Planned Programs Subtotals	-	39.540	43.196

C. Other Program Funding Summary (\$ in Millions)											
<u>Line Item</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u> <u>Base</u>	<u>FY 2024</u> <u>OCO</u>	<u>FY 2024</u> <u>Total</u>	<u>FY 2025</u>	<u>FY 2026</u>	<u>FY 2027</u>	<u>FY 2028</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
• EN4: <i>Enabling Investments (ACD&P)</i>	-	6.781	47.272	-	47.272	51.579	9.792	9.840	9.840	Continuing	Continuing

Remarks

D. Acquisition Strategy

N/A

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Chemical and Biological Defense Program **Date:** March 2023

Appropriation/Budget Activity 0400 / 3	R-1 Program Element (Number/Name) PE 0603384BP / <i>Chemical and Biological Defense Program - Advanced Development</i>	Project (Number/Name) ET3 / <i>Emerging Threats (ATD)</i>
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COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
ET3: <i>Emerging Threats (ATD)</i>	-	0.000	0.000	10.000	0.000	10.000	10.000	10.000	10.000	10.000	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Project ET3 aims to identify and develop scientific solutions, or to modernize capabilities, that allow for a more rapid response to emerging threats. This project supports the development of defense capabilities, collaborating across the DoD and specific interagency partners for doctrine, equipment, and training for the Warfighter and civilian population for defense against emerging threats. Additionally, this project supports advanced development of defensive science and technology capabilities aimed at proactive characterization of threats and potentially disruptive technologies.

Individual efforts in this Project include:

- Developing new science and technology capabilities that allow for the rapid characterization of emerging threats to support operational decision making and requirements setting. Support an integrated approach to developing new or enhanced countermeasures against emerging threats through innovative science and technology solutions for detection, protection, decontamination, and medical countermeasures (MCMs).
- Efforts supply test methodologies and supporting science to verify capabilities, develop protection and hazard mitigation options, expand hazard assessment tools, and develop MCMs against emerging threats.

Chemical and Biological Emerging Threat Innovation Fund challenge DoD Labs and innovation cells to deliver transformational technologies against emerging threats that enables the force to compete, deter, and win in strategic environments described in the National Defense Strategy.

B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2022	FY 2023	FY 2024
Title: 1) Emerging Threat Innovation	-	-	10.000
Description: The Chemical and Biological Defense Emerging Threat Innovation Fund challenges DoD Labs and innovation cells to deliver transformational technologies against emerging threats that enables the force to compete, deter, and win in strategic environments described in the National Defense Strategy.			
FY 2024 Plans: Initiate enhanced capability to more rapidly characterize, and the development of medical countermeasures against, emerging chemical and biological threats through investment in high throughput technologies. Support development of challenges advancing concept and technology development.			
FY 2023 to FY 2024 Increase/Decrease Statement:			

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Chemical and Biological Defense Program		Date: March 2023
Appropriation/Budget Activity 0400 / 3	R-1 Program Element (Number/Name) PE 0603384BP / <i>Chemical and Biological Defense Program - Advanced Development</i>	Project (Number/Name) ET3 / <i>Emerging Threats (ATD)</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2022	FY 2023	FY 2024
FY24 provides funding to address future concepts and innovative technology development.			
Accomplishments/Planned Programs Subtotals	-	-	10.000

C. Other Program Funding Summary (\$ in Millions)

Line Item	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
• CA4: <i>Contamination Avoidance (ACD&P)</i>	37.189	-	-	-	-	-	-	-	-	0.000	37.189
• DE4: <i>Decontamination (ACD&P)</i>	14.747	-	-	-	-	-	-	-	-	0.000	14.747
• IP4: <i>Individual Protection (ACD&P)</i>	4.748	-	-	-	-	-	-	-	-	0.000	4.748
• MT4: <i>Mitigate (ACD&P)</i>	-	17.302	28.785	-	28.785	20.885	15.433	13.369	-	Continuing	Continuing
• PT4: <i>Protect (ACD&P)</i>	-	175.219	179.158	-	179.158	135.096	107.341	123.538	139.376	Continuing	Continuing
• UN4: <i>Understand (ACD&P)</i>	-	52.708	61.638	-	61.638	64.399	48.874	41.264	38.169	Continuing	Continuing

Remarks

D. Acquisition Strategy

N/A

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Chemical and Biological Defense Program **Date:** March 2023

Appropriation/Budget Activity 0400 / 3	R-1 Program Element (Number/Name) PE 0603384BP / <i>Chemical and Biological Defense Program - Advanced Development</i>	Project (Number/Name) CB3 / <i>Chemical Biological Defense (ATD)</i>
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COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
CB3: <i>Chemical Biological Defense (ATD)</i>	-	28.484	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	28.484
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-	-	-

A. Mission Description and Budget Item Justification

Project CB3 develops technology advancements for joint service application in the areas of digital battlespace management technologies, protection/ hazard mitigation and detection. These activities will speed maturing of advanced technologies to reduce risk in system-oriented integration/demonstration efforts. After FY 2022, the Chemical Biological Defense Program (CBDP) RDT&E Projects were restructured to align with the CBDP portfolio construct. CB3 efforts in FY 2022 progress to Projects MT3, PT3, and UN3. This restructuring provides standardization and alignment across CBDP research, development and acquisition efforts.

Individual efforts in this Project include:

- Digital battlespace management focuses on situational awareness and threat agent applications, analytic applications platform for operational situational awareness, non-traditional detection sciences, tactical decision aids, and advanced computational methods.
- Protection/hazard mitigation works to provide technologies that protect from and reduce the impact of both chemical and biological threats and hazards to the Warfighter, weapons platforms, and structures.
- Detection strives to develop technologies for point and standoff detection and identification of both chemical and biological agents.
- Non-Traditional Agent (NTA) Defense includes chemical diagnostics, medical pretreatments, therapeutics, detection, and protection and hazard mitigation.

B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2022	FY 2023	FY 2024
Title: 1) Distributed CB Reconnaissance	1.344	-	-
Description: Develop threat sensing and sampling payloads for manned and unmanned aerial system (UAS) and ground (UGS) platforms to enhance early warning and situational awareness of biological and chemical threats. Sensor development will support dismounted reconnaissance and surveillance missions by providing low size, weight, power and cost sensors or sensing/ collection systems that are rugged, rapid and accurate. Early indications from capabilities under CB Reconnaissance will allow for enhanced warning of threats.			
Title: 2) Enhanced/Emerging Biothreat Sensing	2.849	-	-
Description: Establish robust capability to assess emerging and enhanced biological threats to rapidly develop biosensors for detecting emerging or enhanced biological threats. Quickly develop adaptable, analyte-agnostic laboratory and field-forward detection capabilities to provide a spectrum of improved detection assets for novel threats. This thrust area leverages multi-omics data science or the combining multiple measurements to inform rational and rapid design and development of biodetection			

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Chemical and Biological Defense Program		Date: March 2023
Appropriation/Budget Activity 0400 / 3	R-1 Program Element (Number/Name) PE 0603384BP / <i>Chemical and Biological Defense Program - Advanced Development</i>	Project (Number/Name) CB3 / <i>Chemical Biological Defense (ATD)</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2022	FY 2023	FY 2024
solutions. Synthetic biological concepts will be thoroughly evaluated and exploited for the development of biosensing solutions and refinement of laboratory methods.			
Title: 3) Expeditionary Analytical Toolkit (ExAnT) Description: Develop a suite of expeditionary chemical sensors to provide the warfighter with modernized detection technologies for traditional threats while enhancing detection capabilities for non-traditional, emerging, and mixed chemical hazards.	2.598	-	-
Title: 4) Unattended Perimeter Monitoring Description: Establish a layered defense capability by developing and implementing automated and integrated technologies enabling unattended monitoring for chemical and biological threats. These technologies will provide early warning of vapor, aerosol, solid, and liquid hazards and unencumber the Warfighter by reducing logistics and operator burden. Providing a reliable detect-to-warn capability at fixed or expeditionary sites will enhance the overall protective posture of ground and maneuver forces as robust technologies can be miniaturized for portability and operational sustainment.	1.094	-	-
Title: 5) Unconventional Detection Modalities Description: Utilize a targeted set of programs pushing the boundaries of sensor development by pulling technologies developed from academia and basic research to be integrated into early detection prototypes. These technologies focus on keeping the warfighter ahead of the chemical and biological threats with portable, low SWaP detectors that will protect the general forces and enhance operations on the battlefield by providing warning and field analytics.	0.781	-	-
Title: 6) CBRN Battlespace Surveillance, Alerting & Response Description: Improve the Department of Defense's capability to detect, identify, alert, and responds to deliberate releases and naturally occurring outbreaks of chemical and biological threat agents. The Joint Science & Technology Office (JSTO) will expand on developing predictive CB exposure algorithms based on non-invasively collected human biomarkers. Current predictive algorithms in development by JSTO are based on large in-hospital datasets from patients with comorbidities. Improving on the applicability and efficacy of these algorithms will focus on large, real-time human data collects of chemical and biological agent / agent proxy exposures. Additionally, studies will focus on examining the feasibility of specifically isolating indicators of respiratory infection, determining severity of infection, and predicting return to mission readiness after exposure. This capability will enable early implementation of countermeasures such as isolation, quarantine, and removal from an area, thus potentially reducing transmission, morbidity, and mortality rates. The maturation of algorithms will incorporate Machine Learning (ML) approaches for refining sensitivity and specificity.	4.848	-	-

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Chemical and Biological Defense Program		Date: March 2023
Appropriation/Budget Activity 0400 / 3	R-1 Program Element (Number/Name) PE 0603384BP / <i>Chemical and Biological Defense Program - Advanced Development</i>	Project (Number/Name) CB3 / <i>Chemical Biological Defense (ATD)</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2022	FY 2023	FY 2024
<p>Title: 7) CBRN Decision Aids</p> <p>Description: In order to unencumber the warfighter at the tactical edge, continue to develop and field CBRN Decision Aids on End User Devices (EUDs) in both connected and disconnected operations. Capabilities will focus on utilizing automation, reducing the burden experienced by the warfighter, while providing accurate, actionable information. During this time period, a focus will be put on developing a Contamination Avoidance Decision Aid to inform the warfighter on how to avoid, respond to and plan routes around CB hazards.</p> <p>Another area of focus will be the development of Autonomous Asset Guidance. This capability will be used in conjunction with other capabilities developed under the CBRN Decision Aids portfolio to optimize the use of Autonomous Assets and reduce the burden incurred by the warfighter in order to operate them. This capability will also aim to incorporate, fuse and utilize data from Autonomous Assets to improve and refine other CBRN Decision Aids.</p>	1.400	-	-
<p>Title: 8) CBRN Situational Awareness</p> <p>Description: To enhance CB Situational Awareness, JSTO will expand the types of threats that can be modeled with hazard assessment capabilities to include fixed-wing and rotary-wing drones of interests. These capabilities will allow for single drones and swarms to be modeled.</p> <p>Virtual Reality (VR) and Augmented Reality (AR) technologies will be leveraged to develop CB focused training and mission rehearsal capabilities that will be integrated into systems widely used by the Joint Force. Virtual training environments will be developed to implement, visualize and account for hazard source terms and plumes generated by transport and dispersion (T&D) models. Augmented Reality applications will also be explored for tactical use to maximize warfighter CB situational awareness on the battlefield.</p> <p>JSTO will modernize hazard modeling capabilities by adopting a modular framework and integrating across Service command and control systems. JSTO will further enhance hazard modeling by creating a seamless indoor- to-outdoor T&D modeling capability and improve urban T&D modeling to support operations in urban and mixed environments. New state-of-the-art computational fluid dynamics modeling techniques and their exploitation of the latest computing resources will be leveraged to increase both speed and accuracy.</p> <p>JSTO will develop CB health effect modeling software and analytic tools to support force readiness and facilitate medical planning against chemical and biological agents. Epidemiological models will be developed that quantify and visualize mission operational impacts from exposure to, and spread of, infectious biological threat agents to DoD relevant populations. Additionally, JSTO will leverage Threat Agent Science (TAS) data to enhance capabilities for modeling health effects and host pathogen interactions from</p>	4.264	-	-

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Chemical and Biological Defense Program		Date: March 2023
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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2022	FY 2023	FY 2024
exposures to traditional and non-traditional CB agents. This will provide the warfighter with more accurate casualty estimates accounting for human health effects.			
Title: 9) Air Purification Enhancements Description: This effort supports the Expeditionary Collective Protection (CP). Existing CP systems have high life cycle costs driven by maintenance and limited service life. Science & Technology efforts will focus on optimizing and extending filter life to reduce lifecycle costs while maintaining or improving protection.	0.287	-	-
Title: 10) All-Hazards & Respiratory Protection Description: This effort supports the Respiratory and Ocular Protection. Efforts will improve chemical and biological agent protection while maintaining warfighter capability through integrated research on respirator, seams, closures, and new materials; perform early surveys for end-user jury input; frequent user operational evaluation; focus on closed circuit Self-Contained Breathing Apparatus.	0.814	-	-
Title: 11) Dynamic Multifunction Materials for Second Skin Description: This effort supports the Percutaneous Protection. Efforts will utilize responsive technologies to provide CB protective suits that adapt to the environment by synthesizing scaled samples via roll-to-roll manufacture which exhibit materials properties that reduce thermal burden and integrate with current combat garments.	1.313	-	-
Title: 12) Enhanced Survivability Coatings Description: This effort supports the Materiel Contamination Mitigation. Military equipment coatings are challenging and logistically intensive to decontaminate. Efforts within this thrust seek to produce enhanced coatings that increase chemical warfare agent survivability and decontaminability of military equipment to levels comparable to that of stainless steel. Improved coatings will resist chemical agent absorption and be quickly decontaminated in field, to rapidly return equipment to mission operations level.	0.345	-	-
Title: 13) Equipment Decontamination Description: This effort supports the Materiel Contamination Mitigation. The Warfighter has a limited capability to decontaminate personal equipment, weapons, vehicles, ships, and facilities; Sensitive equipment (weapon system optics, electronic equipment, interior spaces, and aircraft); and hazardous waste. Efforts within this thrust seek to develop decontaminant formulations and procedures that reduce or eliminate residual contamination hazards; enable unit-level decontamination with rapid unmasking; reduce logistic needs (need for water); enable rapid sorting of clean from dirty to rapidly return high-value equipment to normal	0.649	-	-

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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2022	FY 2023	FY 2024
use; and develop improved realistic test methods. Successful efforts will result in improved efficacy, materials compatibility, flexibility, and reduced logistical burden compared to existing and emerging decontamination program requirements.			
Title: 14) Lightweight Protective Garments Description: This effort supports the Percutaneous Protection. Efforts will advance garment material and ensemble technologies with new capabilities using integrated garment designs and fabrication for thermal burden reduction, state-of-the-art threat protection technologies, and supporting test methodologies and methods that provide operationally relevant, comparable data on test garments.	0.144	-	-
Title: 15) Multifunctional Materials for Protection Description: This effort supports the Respiratory and Ocular Protection, Percutaneous Protection, Expeditionary Collective Protection, Materiel Contamination Mitigation, and Personnel Contamination Mitigation. Efforts will discover, develop and integrate novel, reactive/catalytic materials and scale material manufacturing with maximum sorption and reactivity, and characterize materials using state-of-the-art in operando and ambient pressure spectroscopies, for eventual integration into next generation decontaminants, coatings, filters, and protective garments that reactively decontaminate chemical warfare agents.	1.040	-	-
Title: 16) Personnel Decontamination Description: This effort supports the Personnel Contamination Mitigation. Efforts will develop decontaminants for decontamination of unbroken skin with lower lifecycle costs and storage constraints and determination of time, efficacy and logistics burdens to warfighters for mass casualty decontamination. Decrease Warfighter burden in the event of a Chemical Warfare Agent (CWA) exposure by identifying science and technology gaps in the mass personnel decontamination process as well as possible substitutions for current approved personnel decontamination formulations.	4.714	-	-
Accomplishments/Planned Programs Subtotals	28.484	-	-

C. Other Program Funding Summary (\$ in Millions)

Line Item	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
• CA4: Contamination Avoidance (ACD&P)	37.189	-	-	-	-	-	-	-	-	0.000	37.189
• DE4: Decontamination (ACD&P)	14.747	-	-	-	-	-	-	-	-	0.000	14.747
• MT4: Mitigate (ACD&P)	-	17.302	28.785	-	28.785	20.885	15.433	13.369	-	Continuing	Continuing

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Chemical and Biological Defense Program			Date: March 2023			
Appropriation/Budget Activity 0400 / 3		R-1 Program Element (Number/Name) PE 0603384BP / <i>Chemical and Biological Defense Program - Advanced Development</i>			Project (Number/Name) CB3 / <i>Chemical Biological Defense (ATD)</i>	

C. Other Program Funding Summary (\$ in Millions)

Line Item	FY 2022	FY 2023	FY 2024	FY 2024	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028	Cost To	Total Cost
			Base	OCO	Total					Complete	
• TT4: <i>Technology Transition (ACD&P)</i>	0.740	-	-	-	-	-	-	-	-	0.000	0.740
• UN4: <i>Understand (ACD&P)</i>	-	52.708	61.638	-	61.638	64.399	48.874	41.264	38.169	Continuing	Continuing

Remarks

D. Acquisition Strategy

N/A

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Chemical and Biological Defense Program **Date:** March 2023

Appropriation/Budget Activity 0400 / 3	R-1 Program Element (Number/Name) PE 0603384BP / <i>Chemical and Biological Defense Program - Advanced Development</i>	Project (Number/Name) NT3 / <i>Non-Traditional Agents Defense (ATD)</i>
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COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
NT3: <i>Non-Traditional Agents Defense (ATD)</i>	-	10.843	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	10.843
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-	-	-

A. Mission Description and Budget Item Justification

Project NT3 develops future capabilities against emerging and novel threats and verifies current capabilities against Non-Traditional Agents (NTAs). This project focuses on demonstrating fast and agile scientific responses to enhance or develop capabilities that address emerging threats. This project is a comprehensive and focused effort for developing NTA defense capabilities, coordinated with specific interagency partners for doctrine, equipment, and training for the Warfighter and civilian population for defense against NTAs. This project supports advanced technology development of NTA defense science and technology initiatives and transitioning to advance development. After FY 2022, the Chemical Biological Defense Program (CBDP) RDT&E Projects were restructured to align with the CBDP portfolio construct. NT3 efforts in FY 2022 progress to Project UN3. This restructuring provides standardization and alignment across CBDP research, development and acquisition efforts.

Individual efforts in this Project include:

- Support an integrated approach to develop new or enhanced countermeasures against novel and emerging threats through innovative science and technology (S&T) solutions for detection, protection, decontamination and medical countermeasures (MCMs).
- Efforts supply test methodologies and supporting science to verify capabilities, develop protection and hazard mitigation options, expand hazard assessment tools, and develop MCMs against NTAs.

B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2022	FY 2023	FY 2024
Title: 1) Distributed CB Reconnaissance	2.407	-	-
Description: : Develop threat sensing and sampling payloads for manned and unmanned aerial system (UAS) and ground (UGS) platforms to enhance early warning and situational awareness of chemical threats. Sensor development will support dismounted reconnaissance and surveillance missions by providing low size, weight, power and cost sensors or sensing/collection systems that are rugged, rapid and accurate.			
Title: 2) Expeditionary Analytical Toolkit (ExAnT)	6.613	-	-
Description: Provide general and specialized forces with the ability to modernize detection technologies for traditional threats while enhancing detection capabilities for non-traditional, emerging, and mixed chemical hazards.			
Title: 3) Unconventional Detection Modalities	1.823	-	-

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Chemical and Biological Defense Program		Date: March 2023
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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2022	FY 2023	FY 2024
Description: Develop disruptive technologies to identify unknown or emerging chemical threats and develop chemical sensors that can operate in complex threat environments with high fidelity. This thrust area supports other thrust areas and as needed the Joint Force mission needs (e.g., expeditionary, perimeter defense, or unmanned reconnaissance).			
Accomplishments/Planned Programs Subtotals	10.843	-	-

C. Other Program Funding Summary (\$ in Millions)

<u>Line Item</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u> <u>Base</u>	<u>FY 2024</u> <u>OCO</u>	<u>FY 2024</u> <u>Total</u>	<u>FY 2025</u>	<u>FY 2026</u>	<u>FY 2027</u>	<u>FY 2028</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
• CA4: Contamination Avoidance (ACD&P)	37.189	-	-	-	-	-	-	-	-	0.000	37.189
• DE4: Decontamination (ACD&P)	14.747	-	-	-	-	-	-	-	-	0.000	14.747
• IP4: Individual Protection (ACD&P)	4.748	-	-	-	-	-	-	-	-	0.000	4.748
• MT4: Mitigate (ACD&P)	-	17.302	28.785	-	28.785	20.885	15.433	13.369	-	Continuing	Continuing
• PT4: Protect (ACD&P)	-	175.219	179.158	-	179.158	135.096	107.341	123.538	139.376	Continuing	Continuing
• UN4: Understand (ACD&P)	-	52.708	61.638	-	61.638	64.399	48.874	41.264	38.169	Continuing	Continuing

Remarks

D. Acquisition Strategy

N/A

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Chemical and Biological Defense Program **Date:** March 2023

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COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
TM3: <i>Techbase Medical Defense (ATD)</i>	-	144.779	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	144.779
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-	-	-

A. Mission Description and Budget Item Justification

Project TM3 supports preclinical and early phase clinical development of vaccines, therapeutic drugs, and diagnostic capabilities to provide safe and effective medical defense against validated biological threat agents or emerging infectious disease biothreats including bacteria, toxins, and viruses. After FY 2022, the Chemical Biological Defense Program (CBDP) RDT&E Projects were restructured to align with the CBDP portfolio construct. TM3 efforts in FY 2022 progress to Projects EN3, MT3, PT3, and UN3. This restructuring provides standardization and alignment across CBDP research, development and acquisition efforts.

Individual efforts in this project include:

- Innovative biotechnology approaches to advance medical systems designed to rapidly identify, diagnose, prevent, and treat disease due to exposure to biological threat agents will be evaluated.
- Rapid development of medical countermeasure solutions is a crucial modernization strategy to avoid technological surprise against an expanding and sophisticated biological weapons of mass destruction (WMD) threat. Techbase Medical Defense (ATD), therefore, supports the Discovery of Medical Countermeasures Against New and Emerging (DOMANE) threat thrust, which is designed to develop technologies that support understanding, mitigating, and protecting against new and emerging biological threats to include viral, bacterial, and biotoxins.
- Supports the advanced development of medical countermeasures to include prophylaxes, pretreatments, antidotes and therapeutic drugs against new and emerging biological threats. Demonstration of safety and toxicity data through adaptive trials for repurposed U.S. Food & Drug Administration (FDA) approved drugs, novel broad-spectrum drugs and drug combinations supporting submitting Investigational New Drug (IND) processes or Emergency Use Authorizations (EUA). Additionally, this effort supports development of technologies that protect, mitigate and understand new and emerging threats by forecasting pathogenesis and toxicity, structural determinations utilizing high throughput systems to identify both host and pathogen targets using advanced Artificial Intelligence (AI) and a curated repository of high-resolution 3D macromolecular structures to generate drug candidates.
- Leverage lessons learned to shorten future emergency response timelines, mitigate impacts of biological threat outbreaks, and create interim capabilities to protect the warfighter. Leveraging interagency, industry, and academia partnership to build the warfighter's bio-armor to protect against biological threat families. Develop alternative vaccine platform technologies and manage awards utilizing go/no-go checkpoints along the development pathway.

B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2022	FY 2023	FY 2024
Title: 1) Battlefield Readiness - Chemical and Biological Incidence Preparedness and Response (CBIPR)	4.400	-	-

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Chemical and Biological Defense Program		Date: March 2023
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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2022	FY 2023	FY 2024
<p>Description: Provide innovative capabilities to the Warfighter that increase the speed of relevancy, enhance troop preparedness, aid with triage support, and provide diagnosis at lower roles of care. Develop field forward medical diagnostics that allow for multiplexed detection of biological and toxin threats. Leverage immunodiagnostics to identify specific targets using current or novel approaches to enable broader and more accurate diagnosis for a range of targets and across a wider window following exposure.</p>			
<p>Title: 2) Diagnostic Building Blocks - Chemical and Biological Incidence Preparedness and Response (CBIPR)</p> <p>Description: The Diagnostic Building Blocks thrust area lays a foundation for the entire diagnostics portfolio by exploiting areas such as machine learning (ML), synthetic biology and chemistry to develop novel and rapid diagnostic tests for utilization in the event of an outbreak of an unknown threat.</p>	2.751	-	-
<p>Title: 3) Emerging Threats - Chemical and Biological Incidence Preparedness and Response (CBIPR)</p> <p>Description: Advance the diagnosis of emerging and/or low prevalence but high threat biological agents leveraging novel technologies. Develop threat agnostic tests based on host biomarkers that identify known or emerging bacterial or viral infections. Characterize markers for antibiotic resistance or susceptibility to identify challenging threats and inform treatment decisions. Improve capabilities to identify diverse biological agents that are not well characterized using molecular or immunodiagnostic approaches.</p>	3.851	-	-
<p>Title: 4) Medical Countermeasures Initiative</p> <p>Description: The Chemical Biological Incident Preparedness and Response-Medical Countermeasures Initiative (CBIPR-MCMI) will integrate advances in regulatory science and flexible manufacturing technologies and processes; and develop animal models and drug discovery and evaluation platforms as enablers of the advanced development of CBDP medical countermeasure products. These initiatives will lead to the establishment of multi-use platforms and animal models that can be leveraged during a CBRN response to accelerate medical product development and/or regulatory approval as well as reduce overall development costs.</p>	21.593	-	-
<p>Title: 5) Medical Countermeasures Initiative - Validated Nucleic Acid Vaccine Construction</p> <p>Description: Prototype pan-viral medical countermeasure for the protection against new and highly transmissible viruses. This effort will leverage DOD and other interagency partners to develop MCMs for protection against a panel of transmissible viruses with existing innovative commercial molecular and synthetic biology technology.</p>	7.430	-	-
<p>Title: 6) Battlefield Readiness</p>	9.437	-	-

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Chemical and Biological Defense Program		Date: March 2023
Appropriation/Budget Activity 0400 / 3	R-1 Program Element (Number/Name) PE 0603384BP / <i>Chemical and Biological Defense Program - Advanced Development</i>	Project (Number/Name) TM3 / <i>Techbase Medical Defense (ATD)</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2022	FY 2023	FY 2024
<p>Description: Develop platforms to prepare the Warfighter with rapid and easy to use diagnostics tests to make sure they are healthy and ready for movement. Platforms developed with affinity-based identification of either pathogen or host response to the pathogen may leverage immunodiagnostics to identify specific targets using antibodies, or explore other innovative approaches. This will enable broader and more accurate diagnosis for a range of targets and across a wider window following exposure. Investments in this area will provide capabilities to the Warfighter that increase the speed of relevancy, enhance troop preparedness, aid with triage support, and provide diagnosis at lower roles of care.</p>			
<p>Title: 7) Chemical Diagnostics</p> <p>Description: Provide innovative and integrated capabilities to the Warfighter that are able to diagnose threats across the chemical spectrum. Enhance force protection by investing in diagnostics for exposure to traditional and nontraditional CWAs, including pharmaceutical based agents. Coordinate with the Intelligence Community (IC) to understand the chemical threat space, adapting capabilities to meet the need.</p>	5.371	-	-
<p>Title: 8) Clinical Evaluation</p> <p>Description: Optimize the diagnostic development pathway by incorporating independent testing and evaluation for more informed prototype transition prior to advanced development. Investments in this area allow evaluation of diagnostic platforms through real world, austere environment testing. This area maintains access to research sites that offer native populations exposed to diseases of interest that would affect the Warfighter in battlefield settings, and provides the ability to acquire novel technologies and provide analytical testing, evaluation, and reach back support for technologies already fielded.</p>	4.871	-	-
<p>Title: 9) Diagnostic Building Blocks</p> <p>Description: Develop novel, state of the art capabilities that lay the foundation for modernizing other areas within the diagnostics portfolio. This includes exploiting areas such as synthetic biology and chemistry to develop novel and rapid diagnostic tests for utilization in the event of an outbreak of an unknown threat. Invest in efforts that lead to accelerated assay development timelines and optimized test parameters through leveraging artificial intelligence (AI) and machine learning (ML) to allow us to quickly pivot and develop assays for emerging threats in days instead of weeks.</p>	6.456	-	-
<p>Title: 10) Emerging Threats</p> <p>Description: Push beyond the boundaries of the traditional threat list in the field of diagnostics to better prepare for surprise. Development of diagnostic systems that leverage novel approaches to characterize pathogen or host response and can identify the classification of threat (e.g., bacterial vs viral) from an unknown sample. Invest in diagnostic tests that enable the delivery of</p>	3.134	-	-

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Chemical and Biological Defense Program		Date: March 2023
Appropriation/Budget Activity 0400 / 3	R-1 Program Element (Number/Name) PE 0603384BP / <i>Chemical and Biological Defense Program - Advanced Development</i>	Project (Number/Name) TM3 / <i>Techbase Medical Defense (ATD)</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2022	FY 2023	FY 2024
actionable information, such as administering the appropriate medical countermeasure (e.g. antibiotic, antiviral, vaccine), by a medic or primary care provider greatly improves turnaround time for soldier wellness and return to duty.			
<p>Title: 11) Bacterial/Viral/Toxin/Broad Spectrum Prophylaxis</p> <p>Description: The ultimate protection of the warfighter is by pretreating the warfighter to withstand any biological threat with no adverse side effects from the pretreatment. Such pretreatment would enable the warfighter to work in a less restrictive environment, absent of any personal protective equipment allowing operation at peak performance. Investments in this Program Element supports de-risking of candidates for transition into advanced development and includes: manufacturing process development, pre-clinical studies for lead candidates to allow initiation of clinical work, regulatory science to support clinical initiation, animal model development for U.S. Food & Drug Administration (FDA) animal rule licensure, and Phase 1 clinical trials. Candidates transition into advanced development once the Phase 1 clinical trial is complete.</p>	30.411	-	-
<p>Title: 12) Internal COVID - VSV SARS CoV-2 vaccine</p> <p>Description: Provide the warfighter with protection against Coronavirus Disease 2019 (COVID-19) through the development of a SARS-CoV-2 VSV vaccine.</p>	5.100	-	-
<p>Title: 13) Bacterial Therapeutics</p> <p>Description: Identify, optimize and evaluate potential therapeutic compounds effective against bacterial threat agents.</p>	13.886	-	-
<p>Title: 14) Toxin Therapeutics</p> <p>Description: Discover and develop therapeutic countermeasures to protect the warfighter against biotoxin threats.</p>	0.250	-	-
<p>Title: 15) Viral Therapeutics</p> <p>Description: Identify, optimize and evaluate potential therapeutic candidates effective against designated viral threat agents.</p>	13.887	-	-
<p>Title: 16) Nerve Agent Prophylaxis/Pretreatments</p> <p>Description: Develop pretreatments and prophylactics that counter non-traditional agents (NTAs) and emerging chemical threats to protect the lives and effectiveness of our Warfighters, thus maintaining force strength and force capability. Successful prophylactics will rapidly detoxify a broad spectrum of compounds of interest (COIs).</p>	3.352	-	-
<p>Title: 17) Pharmaceutical Based Agents (PBAs)</p> <p>Description: Focuses on therapeutic and proactive strategies to effectively minimize injuries and/or death resulting from exposure to Pharmaceutical Based Agents (PBAs). This will allow the Warfighter to maintain operational capacity in a chemically contested</p>	4.065	-	-

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Chemical and Biological Defense Program		Date: March 2023
Appropriation/Budget Activity 0400 / 3	R-1 Program Element (Number/Name) PE 0603384BP / <i>Chemical and Biological Defense Program - Advanced Development</i>	Project (Number/Name) TM3 / <i>Techbase Medical Defense (ATD)</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2022	FY 2023	FY 2024
battlefield scenario. This effort involves the evaluation FDA approved therapeutics for operational use, as well as generation of novel drug products to enhance level of protection and/or operational utility for the Warfighter. Efforts in this area are designed to develop drug candidates that will ultimately be submitted for Food and Drug Administration (FDA) licensure or to identify previously licensed products for new uses in the treatment and pretreatment against chemical warfare injury.			
Title: 18) Reactivators of AChE as Therapeutics (ReACT) Description: The warfighter requires rapid acting medical countermeasures (MCMs) to counter adverse effects from exposure to Nerve Agents (NAs) and maintain force lethality. This effort involves the development of improved therapies for acetylcholinesterase enzyme reactivation. Efforts in this area are focused on formulation development and pre-clinical studies for potential candidates that will ultimately be submitted for U.S. Food and Drug Administration (FDA) licensure or previously licensed products for new uses in the treatment of chemical warfare casualties.	4.534	-	-
Accomplishments/Planned Programs Subtotals	144.779	-	-

C. Other Program Funding Summary (\$ in Millions)											
Line Item	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
• EN3: <i>Enabling Investments (ATD)</i>	-	39.540	43.196	-	43.196	43.198	44.449	44.449	44.449	Continuing	Continuing
• EN4: <i>Enabling Investments (ACD&P)</i>	-	6.781	47.272	-	47.272	51.579	9.792	9.840	9.840	Continuing	Continuing
• MB4: <i>Medical Biological Defense (ACD&P)</i>	46.791	-	-	-	-	-	-	-	-	0.000	46.791
• MT3: <i>Mitigate (ATD)</i>	-	86.157	100.791	-	100.791	89.511	91.704	85.795	85.480	Continuing	Continuing
• PT3: <i>Protect (ATD)</i>	-	32.113	29.261	-	29.261	48.969	42.794	46.159	52.581	Continuing	Continuing
• PT4: <i>Protect (ACD&P)</i>	-	175.219	179.158	-	179.158	135.096	107.341	123.538	139.376	Continuing	Continuing
• UN3: <i>Understand (ATD)</i>	-	68.415	83.825	-	83.825	81.392	87.384	73.515	71.015	Continuing	Continuing

Remarks

D. Acquisition Strategy

N/A

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Chemical and Biological Defense Program										Date: March 2023		
Appropriation/Budget Activity 0400 / 3					R-1 Program Element (Number/Name) PE 0603384BP / <i>Chemical and Biological Defense Program - Advanced Development</i>				Project (Number/Name) TT3 / <i>Technology Transition (ATD)</i>			
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
TT3: <i>Technology Transition (ATD)</i>	-	7.589	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	7.589
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Project TT3 validates high-risk/high-payoff technologies, concepts-of-operations, and a Joint Combat Developer concept development and experimentation process to significantly improve Warfighter capabilities in preparation for transition of mature chemical and biological (CB) defense technologies to advanced development programs. This project addresses the three primary chemical and biological defense thrust areas of Assess, Protect, and Mitigate with an emphasis on Integrated Early Warning (IEW) and Integrated Layered Defense (ILD). IEW is conducted through a coordinated program approach focused on layering chemical and biological detection technologies and integrating CB threat indicators, providing a combination of awareness and understanding that facilitates effective decision making so the force can continue military operations and achieve mission success in a CBRN environment. The ILD achieves solutions for capability gaps across medical and non-medical commodity areas to enable warfighter survival and rapid recovery in a CBRN environment. After FY 2022, the Chemical Biological Defense Program (CBDP) RDT&E Projects were restructured to align with the CBDP portfolio construct. TT3 efforts in FY 2022 progress to Project EN3. This restructuring provides standardization and alignment across CBDP research, development and acquisition efforts.

Individual efforts in this Project include:

- Programs that offer the opportunity to identify and efficiently mature emerging technologies, reduce risks, and finalize engineering and integration efforts.
- Programs that seek to demonstrate the potential for enhanced military operational capability and/or cost effectiveness. Upon conclusion of the technical and operational demonstrations, the user or sponsor provides a determination of the military utility and operational impact of the technology and capability demonstrated. Successfully demonstrated technologies with proven military utility can remain in place for future extended user evaluations, accepted into the advanced stages of the formal acquisition process, proceed directly into limited or full- scale production or be returned to the technical base for further development.

B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2022	FY 2023	FY 2024
Title: 1) Advanced Technology Demonstration	4.640	-	-
Description: Advanced Technology Demonstrations (ATDs) facilitate Warfighters and other operational stakeholders' participation in field demonstrations that evaluate integrated technologies or prototype systems with demonstrated technical performance in high fidelity and realistic operating environments. Building on the technology concepts and user assessments thrust areas conducted earlier in the technology maturation process, feedback from the Warfighters during ATDs ensures that these technologies are operationally relevant, value added, and can be matured and potentially transitioned in a timely and effective manner to S&T Managers or transition partners for advanced development and employment across the spectrum of Joint Force actions in a CBRN Defense Environment. In some cases, ATD residuals are left with ATD operating units for extended user			

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Chemical and Biological Defense Program		Date: March 2023
Appropriation/Budget Activity 0400 / 3	R-1 Program Element (Number/Name) PE 0603384BP / <i>Chemical and Biological Defense Program - Advanced Development</i>	Project (Number/Name) TT3 / <i>Technology Transition (ATD)</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2022	FY 2023	FY 2024
evaluations which provides additional real world data to technology developers. ATD outcomes area designed to enhance transition of cutting edge CBRN technologies and mitigate transition risk by demonstrating operational utility and initial Technics, Tactics and Procedures.			
Title: 2) Technology Concept Description: Initiatives to validate technology requirements and scope future S&T programs with Warfighter stakeholders, including Combat Developers and Service representatives. Results from these experiments shape Operating Concepts, doctrine, and materiel systems requirements for the future Joint Force and inform technology developers about potential Warfighter utility of emerging technologies and technology concepts for subsequent portfolio investment. Activities in this area focus on Surveys, User Groups, Table Top Exercises (TTXs), and practical demonstration or User feedback workshops to develop Use Cases, desired operational capabilities, key attributes and explore Concepts of Employment to assess feasibility/utility of emerging technologies.	1.296	-	-
Title: 3) User Assessment Description: User Assessments examine maturing technologies and provide opportunities for early Warfighter input into the form, fit, and function of maturing S&T prototypes and technologies; and as appropriate, assess them within a simulated operational environment. The assessments serve as baselines for future Advanced Technology Demonstration (ATD) programs, and drive S&T gap analysis for key customers and partners. User assessments are characterized by TTXs, Early User Assessments, Technical demonstrations and field experiments that provide candid feedback focused on applicability, utility and recommended improvements while exploring system limitations, vulnerabilities and technology tradeoff analyses of innovative technologies in a non-attributional environment.	1.653	-	-
Accomplishments/Planned Programs Subtotals	7.589	-	-

C. Other Program Funding Summary (\$ in Millions)											
Line Item	FY 2022	FY 2023	FY 2024	FY 2024	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028	Cost To	Total Cost
			Base	OCO	Total					Complete	
• TT4: <i>Technology Transition (ACD&P)</i>	0.740	-	-	-	-	-	-	-	-	0.000	0.740

Remarks

D. Acquisition Strategy
N/A

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Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Chemical and Biological Defense Program **Date:** March 2023

Appropriation/Budget Activity 0400: <i>Research, Development, Test & Evaluation, Defense-Wide I BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	R-1 Program Element (Number/Name) PE 0603884BP / <i>Chemical and Biological Defense Program - Dem/Val</i>
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COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
Total Program Element	0.000	133.902	252.010	316.853	0.000	316.853	271.959	181.440	188.011	187.385	Continuing	Continuing
UN4: <i>Understand (ACD&P)</i>	-	0.000	52.708	61.638	0.000	61.638	64.399	48.874	41.264	38.169	Continuing	Continuing
PT4: <i>Protect (ACD&P)</i>	-	0.000	175.219	179.158	0.000	179.158	135.096	107.341	123.538	139.376	Continuing	Continuing
MT4: <i>Mitigate (ACD&P)</i>	-	0.000	17.302	28.785	0.000	28.785	20.885	15.433	13.369	0.000	Continuing	Continuing
EN4: <i>Enabling Investments (ACD&P)</i>	-	0.000	6.781	47.272	0.000	47.272	51.579	9.792	9.840	9.840	Continuing	Continuing
CA4: <i>Contamination Avoidance (ACD&P)</i>	-	37.189	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	37.189
DE4: <i>Decontamination (ACD&P)</i>	-	14.747	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	14.747
IP4: <i>Individual Protection (ACD&P)</i>	-	4.748	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	4.748
MB4: <i>Medical Biological Defense (ACD&P)</i>	-	46.791	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	46.791
TM4: <i>Techbase Medical Defense (ACD&P)</i>	-	29.687	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	29.687
TT4: <i>Technology Transition (ACD&P)</i>	-	0.740	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.740

A. Mission Description and Budget Item Justification

This program element (PE) resources Advanced Component Development and Prototypes across the Understand, Protect, Mitigate, and Enabling Investments portfolios. Program efforts validate high-risk/high-payoff technologies and their respective concepts of operations for significant improvement to Warfighter capabilities in preparation for the transition of mature technologies to advanced development programs requiring chemical and biological (CB) defense technologies. Chemical Biological Defense Program (CBDP) investments provide an integrated, layered capability to enable Countering Weapons of Mass Destruction (CWMD) missions ranging from combat operations to Department of Defense (DoD) support to domestic incident prevention and response. The Projects in this PE support component and subsystem maturity prior to integration in major, complex systems and may involve risk reduction initiatives and include technology demonstrations. This effort facilitates transitions of Integrated Early Warning and Integrated Layered Defense products. FY24 funding accelerates characterization and situational awareness of emerging biothreats and accelerates delivery of improved protection from and mitigation of biothreats, including rapid repurposing of available therapeutics and development of new vaccines.

Individual Projects include:

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Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Chemical and Biological Defense Program		Date: March 2023
Appropriation/Budget Activity 0400: <i>Research, Development, Test & Evaluation, Defense-Wide I BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	R-1 Program Element (Number/Name) PE 0603884BP / <i>Chemical and Biological Defense Program - Dem/Val</i>	
<p>- Understand (UN4): Maintain effort in distinguishing between bacterial, viral, and toxin diagnostics. Update detector libraries for relevant detection and identification systems. Continue efforts to integrate detection capabilities into Service combat platforms. Develop detection and diagnostic technologies with compatibility to receive and transmit sensor data on Service networks. Identify Service concepts for Integrated Early Warning (IEW) and maintain cyber compliance of fielded Chemical Biological Radiological and Nuclear (CBRN) information systems.</p> <p>- Protect (PT4): Continued efforts to unencumber the warfighter by delivering improved personal protection capabilities that incorporate inherent survivability into Service equipment and platforms and which offer protection against the diverse threat agents that near-peer adversaries are developing. Develop capability for next-generation individual protective equipment. In collaboration with Biomedical Advanced Research and Development Authority (BARDA), develops and tests monoclonal antibody medical countermeasures through Phase 1 clinical trials as an accelerated antibodies program. Develops a robust computational toolset/prototype database intended to decrease product development risk throughout the drug development life cycle, accelerate candidate development, and enable preemptive preparedness and rapid response. Leveraging the Advanced Development Manufacturing Network, delivers the ability to rapidly develop Medical Countermeasures (MCMs) against emerging or known chemical/biological threats by establishing mature platform technologies that allow for rapid response. Develops plague monoclonal antibody-based medical countermeasure prototype through Phase 1 clinical testing. Continues work to deliver prototype nucleic acid-based vaccines for three CBRN and two potential pandemic threats through non-clinical and human Phase I clinical trials.</p> <p>- Mitigate (MT4): Sustain efforts in antiviral therapeutics. Develop capabilities to incorporate the use of in silico and Machine Learning/Artificial Intelligence technologies for drug discovery and development. Increase efforts regarding platform technologies. Development of repurposing pharmaceuticals that enable a rapid response capability to combat emerging threats. Supports the development of robot decontamination platform systems. Completes prototype development for a sprayable slurry Science & Technology (S&T) transition to decontaminate hardened and sensitive equipment, such as weapon system optics, electronic equipment and spot decontamination on vehicles. Continues prototype development for S&T transitions for tactical temporary coatings that mitigate the effects of a CBRN attack by protecting assets from the effects of chemical warfare agents.</p> <p>- Enabling Investments (EN4): Development of efforts to evaluate integrated technologies or prototype systems in high fidelity and realistic operating environment, including system-specific efforts that help expedite technology transition from the laboratory to operational use. Increase efforts to improve integration of collective protection into Service major combat platforms.</p> <p>- Contamination Avoidance (CA4), Decontamination (DE4), Individual Protection (IP4), Medical Biological Defense (MB4), Techbase Medical Defense (TM4) and Technology Transition (TT4) are no longer active FY24 Projects due to budget restructuring.</p> <p>The projects in this PE support the advanced component technology development phase of the DoD acquisition system and are therefore correctly placed in Budget Activity 4.</p>		

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Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Chemical and Biological Defense Program **Date:** March 2023

Appropriation/Budget Activity 0400: <i>Research, Development, Test & Evaluation, Defense-Wide I BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	R-1 Program Element (Number/Name) PE 0603884BP / <i>Chemical and Biological Defense Program - Dem/Val</i>
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B. Program Change Summary (\$ in Millions)	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Previous President's Budget	133.945	291.364	261.239	-	261.239
Current President's Budget	133.902	252.010	316.853	-	316.853
Total Adjustments	-0.043	-39.354	55.614	-	55.614
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-39.354			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	3.700	-			
• SBIR/STTR Transfer	-3.742	-			
• Other Adjustments	-0.001	-	55.614	-	55.614

Congressional Add Details (\$ in Millions, and Includes General Reductions)

Project: TM4: *Techbase Medical Defense (ACD&P)*

Congressional Add: *Development of medical countermeasures against novel entities (DOMANE)*

Congressional Add Subtotals for Project: TM4

Congressional Add Totals for all Projects

	FY 2022	FY 2023
	4.500	-
	4.500	-
	4.500	-

Change Summary Explanation

Funding: FY 2022 (+\$4.500 Million): Congressional Add for (development of medical countermeasures against novel entities (DOMANE) is reflected in the Previous President's Budget total.

FY 2022 (+\$3.700 Million): Below threshold reprogramming increase supports advanced emerging threat defense and rapid monoclonal antibody development.

FY 2022 (-\$3.742 Million): Transfer of funding to support Small Business Innovative Research/Small Business Technology Transfer efforts.

FY 2023 (-\$39.354 Million): Congressional Directed Reductions.

FY 2024 (\$55.614 Million): Increase for medical countermeasure manufacturing optimization (+\$38.100 Million), Departmental inflation rate adjustments (+\$1.266 Million); and Compact Vapor Chemical Agent Detector activities in support of MS B, Antiviral Oral Therapeutic natural history study, Reactivating Nerve Agent Treatment System animal model development, and additional enhanced biodefense priority efforts (+\$16.248 Million).

Schedule: N/A

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Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Chemical and Biological Defense Program **Date:** March 2023

Appropriation/Budget Activity 0400: <i>Research, Development, Test & Evaluation, Defense-Wide</i> / BA 4: <i>Advanced Component Development & Prototypes (ACD&P)</i>	R-1 Program Element (Number/Name) PE 0603884BP / <i>Chemical and Biological Defense Program - Dem/Val</i>
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Technical: Provides for critical new start programs Advanced Differential Diagnostics (ADD), Automated Decon System (ADS), Antiviral Oral Therapeutic (AVO TX), Botulinum Toxin Treatment program (BOT Tx), Consolidated Nerve Agent Treatment System (CNATS), Colorimetric Indicator (C-IND), Physiological Monitoring Sensor Suite (PM2S), and the Reactivating Nerve Agent Treatment System (RNATS).

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Chemical and Biological Defense Program										Date: March 2023		
Appropriation/Budget Activity 0400 / 4					R-1 Program Element (Number/Name) PE 0603884BP / <i>Chemical and Biological Defense Program - Dem/Val</i>				Project (Number/Name) UN4 / <i>Understand (ACD&P)</i>			
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
UN4: <i>Understand (ACD&P)</i>	-	0.000	52.708	61.638	0.000	61.638	64.399	48.874	41.264	38.169	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Understand Advanced Component Development and Prototypes (ACD&P) Project provides the Joint Force the ability to continually receive information about the Chemical Biological Radiological and Nuclear (CBRN) situation at a desired time and place by detecting, identifying, and quantifying CBRN hazards in air, water, or on land, and on personnel, equipment or facilities. Efforts also develop a clear understanding of the current and predicted CBRN situation; collect, query, and assimilate information from sensors in real time to inform decisions and provide impacts of CBRN hazards. In FY 2023, the Chemical Biological Defense Program (CBDP) RDT&E Projects were restructured to align with the CBDP portfolio construct. UN4 efforts in FY 2022 remain in Project CA4. This restructuring provided standardization and alignment across CBDP research, development and acquisition efforts.

Efforts included in this Project are:

- (1) Advanced Differential Diagnostics (ADD)
- (2) Advanced Emerging Threat Defense (AET DEFENSE)
- (3) Biological Defense Improvement Program (BDIP)
- (4) Non-Targeted Sequencing Identification System (NSIS)
- (5) Physiological Monitoring Sensor Suite (PM2S)
- (6) Colorimetric Indicator (C-IND)
- (7) CBRN Support to Command and Control (CSC2)
- (8) Compact Vapor Chemical Agent Detector (CVCAD)
- (9) Proximate Chemical Agent Detector (PCAD)
- (10) Surveillance and Pathogen Characterization-Enhanced Biodefense (SPCHAR-ENBD)

The Advanced Differential Diagnostics (ADD) is a new start program in FY24 and will determine if an individual has likely been infected and the nature of that infection, during early stages of illness for unknown threats, including biological warfare agents and emerging infectious diseases. ADD will provide timely feedback for disease prevention in operational environments, by quickly identifying warfighters who may have contracted illness. ADD will utilize funding to initiate Technology Maturation and Risk Reduction activities, including the development and assessment of selected candidate prototypes.

The Advanced Emerging Threat Defense (AET DEFENSE) program continues to address the highest priority CBRN gaps and supports the CBDP Strategic Line of Effort to meet current and emerging threats by anticipating CB hazards and identifying capabilities to counter emerging and future threats. The AET DEFENSE program collaborates with the Joint Services, interagency, and international partners to align RDT&E resources to determine readiness against emerging threats, to include Non-Traditional Agents (NTAs), such as Novichoks and Pharmaceutical-Based Agents (PBA) (e.g. synthetic opioids), emerging biological threats, toxins and other

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Chemical and Biological Defense Program	Date: March 2023
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Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603884BP / <i>Chemical and Biological Defense Program - Dem/Val</i>	Project (Number/Name) UN4 / <i>Understand (ACD&P)</i>
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advanced and emerging threats as they are identified across the entire CBDP enterprise portfolio. In FY24, AET Defense activities continue to focus on demonstrating and evaluating technologies to assess performance against emerging threats.

The Biological Defense Improvement Program (BDIP) will enhance the set of biodefense capabilities to significantly improve its ability to rapidly understand, prevent, prepare for, respond to, and recover from a vast array of future biological threats. BDIP will support the Department of Defense (DoD) CBDP mission with rapid prototyping capabilities to understand, and protect against threats. BDIP will address joint and service gaps and priorities related to biodefense, and will develop and execute a biodefense strategy. It considers the Biological Warfare threat and vulnerabilities to give biodefense the agility and speed necessary to provide relevant, effective, affordable, and sustainable capabilities that can be ubiquitously deployed on the battlefield against current, emerging and future biological threat. The DoD with academia, industry and other interagency departments will partner to gain opportunities to accelerate technology, adopt surge capacity and advance consumable and alternative solution across the entire Biodefense portfolio. BDIP transitions efforts to the Non-Targeted Sequencing Identification System (NSIS), Wearable All Hazard Remote Monitoring Program (WARP), Far Forward Biological Sequencing (FFBS), and the Physiological Monitoring Sensor Suite (PM2S) programs in FY24.

The Non-Targeted Sequencing Identification System (NSIS) provides a commercially available, rapid biological sequencing capability with the potential to identify an unlimited number of biological warfare agents (BWA), including emerging, engineered, or enhanced organisms on or near the objective. This reduces unknown identification time from days to hours, enabling decision support to all Command echelons (tactical, operational, strategic) at the speed of need. The NSIS itself is a small, portable device (about the size of tablet) that weighs approximately 5 lbs. It comes equipped with consumables (flow cells) that are small, electronic chips for processing the biological sample. Early testing will include operational demonstrations and user touchpoints with the National Guard Bureau to develop the necessary procedures for processing low- and high-density samples. Unlike traditional identification techniques in the field, NSIS identifies anomalies in Deoxyribonucleic Acid (DNA) and Ribonucleic Acid (RNA) and translates the data on a small computing device, enabling fast and effective mitigation and protection for the force. This capability can determine whether the enemy is using synthetic biology for the purpose of thwarting traditional medical countermeasures or current detection/identification devices. FY24 funding will be used for initial test articles, initial verification and validation of current commercial off-the-shelf (COTS) solutions, and nominal program support costs.

The Physiological Monitoring Sensor Suite (PM2S) is a new start program in FY24 that transitions out of the BDIP effort. It will develop CBRN exposure software algorithms that analyze physiological data collected from wearable sensors. These algorithms will provide commanders with actionable information to maximize warfighter readiness, performance, and enhance resiliency before, during, and after CBRN operations. Capabilities developed will integrate with the Chemical and Biological Wearables - Enhanced Biodefense (CB WEARABLES-ENBD) solution set to enable the Joint force to conduct force-wide monitoring to detect the presence or predict initial onset of CBRN threats under an integrated layered defense approach.

The Colorimetric Indicator (C-IND) is a new start program in FY24 and will provide the General Forces with low-cost, easy to use, higher confidence liquid, solid and vapor hazard detection capabilities for traditional and emerging (e.g. PBAs, NTAs in various states of matter) chemical hazards. The intent of the C-IND program is to provide improved hazard detection and classification performance with reduced false alarm rate, and potential for integration onto unmanned platforms. The C-IND was submitted as a new start pending new requirements to be developed. The C-IND program will provide a significantly better M256 Vapor Card that will address emerging and traditional threats (e.g. PBAs, NTAs in various states of matter) as well as drastically improve the usability/training burden that is associated with current Vapor Card

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as the recognized chemical unmasking tool. In FY24, C-IND will initiate and conduct table top exercises to inform stakeholder's of requirements and fund technology maturation risk reduction (TMRR) testing activities.

The CBRN Support to Command and Control (CSC2) is the overarching System of Systems (SoS) software that provides for the interoperability and integration of CBRN and non-CBRN sensors to achieve needed situational awareness and understanding to accomplish CBRN integrated layered defense, interdependent with Service Computing Environments. CSC2 will establish Service and Joint All Domain Command and Control (JADC2) compatible CBRN Concept of Employment (COE) architecture and deployment environments. FY24 consolidates Modernization CBRN Information Systems (MOD CBRN IS) with CSC2 for continuous engineering of the currently deployed legacy CBRN information systems and synchronization for the sunset of legacy capabilities with the deployment of CSC2. In FY24, CSC2 will continue software developmental testing and start operational testing to support the continuous development, integration, engineering, and delivery of Minimal Viable Capability Releases (MVCR).

The Compact Vapor Chemical Agent Detector (CVCAD) is designed to be an unobtrusive, low-profile chemical detection capability that will continuously, and autonomously, monitor and alert general and specialized units to an unsafe environment without further burdening the warfighters payload or interfering with the primary mission. The small form factor (less than 2 lbs.) is amenable to both man-worn and unmanned aerial or ground system operations to enable timely personnel protective action and other force protection decisions. In FY24, the CVCAD will continue efforts under UN5 to work engineering manufacturing and development.

The Proximate Chemical Agent Detector (PCAD) will be a handheld standoff, liquid and solid trace chemical agent detector to detect a wide range of chemical threats. The technology will provide detection and location of chemical agents on various surfaces and under a variety of environmental conditions. FY24 funding develops a handheld non-contact prototype for trace chemical detection on various surfaces, supports transition of developed prototypes from the Defense Threat Reduction Agency Joint Science and Technology Office, and conducts developmental testing of breadboard prototypes.

The Surveillance and Pathogen Characterization-Enhanced Biodefense (SPCHAR-ENBD) will utilize Pathogenicity Studies to investigate development of disease of CBRN threat agents and verify usefulness of these disease models. Results from these studies will be utilized to identify targets for MCM (Medical Countermeasures) development, testing, and identify groups of CBRN threat agents that can be treated by broad-spectrum MCMs.

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2022	FY 2023	FY 2024
<p>Title: 1) ADD</p> <p>Description: Product development and product management.</p> <p>FY 2024 Plans: Issue Request for Project Proposals, award Other Transaction Authority project agreements, and initiate development and evaluation of prototype solutions.</p> <p>FY 2023 to FY 2024 Increase/Decrease Statement:</p>	-	-	9.987

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B. Accomplishments/Planned Programs (\$ in Millions)		FY 2022	FY 2023	FY 2024
Program/project is new start effort in FY 2024.				
<p>Title: 2) AET DEFENSE</p> <p>Description: AET Defense activities will focus on demonstrating and evaluating technologies to assess performance against emerging threats.</p> <p>FY 2023 Plans: Continue efforts to address emerging biological threats and Pharmaceutical Based Agents (PBAs). Update spectral libraries and hazard data management tools to incorporate emerging threat information. Produce additional data to better assess detection and decontamination capabilities against new requirements and inform rapid fielding decisions. Conduct table top exercises to support Joint Service and interagency tactics, techniques, and procedures (TTP) development and gaps analysis for materiel solutions. Monitor market surveys and assessments of technologies for rapid fielding by Chemical Biological Defense Program to mitigate emerging threat gaps as threats are identified.</p> <p>FY 2024 Plans: Continue efforts to address emerging biological threats and Pharmaceutical Based Agents (PBAs). Begin evaluation and assessment of ability to detect and mitigate three additional threat classes. Update spectral libraries and hazard data management tools to incorporate emerging threat information. Produce additional data to better assess detection and defensive capabilities against new requirements and inform rapid fielding decisions. Conduct three table top exercises on three additional threat materials to support Joint Service and interagency tactics, techniques, and procedures (TTP) development and gap analysis for materiel solutions. Monitor market surveys and assessments of technologies for rapid fielding by the CBDP to mitigate defensive capability gaps as emerging threats are identified.</p> <p>FY 2023 to FY 2024 Increase/Decrease Statement: Increase due to significant increase in quantity of emerging threats being assessed for impacts simultaneously. Increase also due to a more thorough understanding of all defensive capabilities, not just sensors, against emerging threats within the AET DEFENSE program.</p>		-	2.792	6.629
<p>Title: 3) BDIP</p> <p>Description: Product Development, Program Management, Test and Evaluation and Support.</p> <p>FY 2023 Plans: Initiate market research and conduct a requirements table top exercise in order to release the Request for Information (RPI) and request for white papers for prototyping plan#1 and Other Transactional Agreements (OTA) Award.</p> <p>FY 2023 to FY 2024 Increase/Decrease Statement:</p>		-	2.398	-

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B. Accomplishments/Planned Programs (\$ in Millions)		FY 2022	FY 2023	FY 2024
Program/project funding transferred to another funding line. BDIP transitions efforts to the Non-Targeted Sequencing Identification System (NSIS), Wearable All Hazard Remote Monitoring Program (WARP), Far Forward Biological Sequencing (FFBS), and the Physiological Monitoring Sensor Suite (PM2S) programs in FY24.				
<p>Title: 4) NSIS</p> <p>Description: Test and Evaluation, Product Purchase, and Program Management Support.</p> <p>FY 2024 Plans: Conduct initial verification and validation of commercial-off-the-shelf genomic sequencing devices, purchase Oxford Nanopore Technologies MinION Mk1C genomic sequencing devices, and assess military utility for the National Guard Bureau, US Navy, and US Marine Corps. Continue user feedback trials with the National Guard Bureau Civil Support Teams. Funds will pay for program labor, office management, and administrative processes to include (but not limited to) program oversight, resource justification, budgeting and programming, milestone and schedule tracking.</p> <p>FY 2023 to FY 2024 Increase/Decrease Statement: Program/project funding transferred from another funding line. Program/project funding transferred from BDIP.</p>		-	-	0.653
<p>Title: 5) PM2S</p> <p>Description: This effort will develop algorithms to detect chemical and biological threats.</p> <p>FY 2024 Plans: PM2S will develop and conduct software hardening on chemical and biological defense physiological monitoring algorithms to enable capabilities to be deployed on a number of service-sponsored hardware architectures.</p> <p>FY 2023 to FY 2024 Increase/Decrease Statement: Program/project is new start effort in FY 2024.</p>		-	-	1.200
<p>Title: 6) C-IND</p> <p>Description: Program Development</p> <p>FY 2024 Plans: Initiate and conduct table top exercises to inform stakeholder's of requirements and fund technology maturation risk reduction (TMRR) testing activities.</p> <p>FY 2023 to FY 2024 Increase/Decrease Statement:</p>		-	-	1.043

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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2022	FY 2023	FY 2024
Program/project is new start effort in FY 2024.			
<p>Title: 7) CSC2</p> <p>Description: Automated Warning, Reporting, Analysis and Decision Support Tools. Service Common Operating Environment (COE) Convergence.</p> <p>FY 2023 Plans: Advanced development of next generation warning and reporting capabilities to support operations, planning & execution. Integration of Non CBRN Data source into decision support tools. Initial convergence of CBRN information onto Service Common Operating Environments and Computing Environments (CoEs/CEs) and associated Cyber security requirements. Initial investments in artificial intelligence and machine learning applications and processes, and digital engineering and model-based systems engineering.</p> <p>FY 2023 to FY 2024 Increase/Decrease Statement: Effort consolidated to single effort "CSC2 Execution Phase of Software Acquisition pathway, and Continuous Software Development, Integration, and Delivery" in FY24.</p>	-	18.168	-
<p>Title: 8) CSC2</p> <p>Description: Program Management and Support</p> <p>FY 2023 Plans: Continue Program office management and administration processes to include but not limited to program oversight, resource justification, budgeting and programming, milestone and schedule tracking.</p> <p>FY 2023 to FY 2024 Increase/Decrease Statement: Effort consolidated to single effort "CSC2 Execution Phase of Software Acquisition pathway, and Continuous Software Development, Integration, and Delivery" in FY24.</p>	-	2.800	-
<p>Title: 9) CSC2</p> <p>Description: Product Development, Integration and Sensor Management</p> <p>FY 2023 Plans: Continue integration of Chemical Biological Radiological and Nuclear (CBRN) sensor portfolio through a common sensor management system to include data visualization, analysis and movement of data from CBRN sensors to and through service network.</p> <p>FY 2023 to FY 2024 Increase/Decrease Statement:</p>	-	12.380	-

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B. Accomplishments/Planned Programs (\$ in Millions)		FY 2022	FY 2023	FY 2024
Effort consolidated to single effort "CSC2 Execution Phase of Software Acquisition pathway, and Continuous Software Development, Integration, and Delivery" in FY24.				
<p>Title: 10) CSC2</p> <p>Description: CSC2 Execution Phase of Software Acquisition pathway, and Continuous Software Development, Integration, and Delivery</p> <p>FY 2024 Plans: Continue to develop CBRN applications to support: CBRN hazard warning, reporting, analysis, and prediction; CBRN impact modeling; and Decision Support Tools. Continue the development of a Cloud-Native Software architecture for the interoperability between CBRN sensors, CBRN applications, and Service computing environments. Start a software development pipeline using Development, Security, Operations (DevSecOps) leveraging existing DoD DevSecOps infrastructure. Continue cybersecurity testing and operational testing in support of verifying the iterative, agile software to deliver Minimal Viable Capability Releases (MVCR).</p> <p>FY 2023 to FY 2024 Increase/Decrease Statement: Effort consolidated to single effort "CSC2 Execution Phase of Software Acquisition pathway, and Continuous Software Development, Integration, and Delivery" in FY24.</p>		-	-	28.039
<p>Title: 11) CVCAD</p> <p>Description: Prototype Advanced Development, Testing & Program Management</p> <p>FY 2023 Plans: Continue and complete advanced development on prototype systems, conduct down select on competing technologies, prepare for initiation of engineering development. CVCAD will brief Acquisition Steering Panel (ASP) in 2QFY23 to inform milestone decision and prepare for next milestone, Milestone B. Activities will include milestone documentation, developmental testing and program office management and administration processes to include program oversight, resource justification, budgeting and programming, milestone and schedule tracking.</p> <p>FY 2024 Plans: Finalization of system design to complete Milestone B. Activities will include milestone documentation, developmental testing and program office management and administration processes to include program oversight, resource justification, budgeting and programming, milestone and schedule tracking.</p> <p>FY 2023 to FY 2024 Increase/Decrease Statement:</p>		-	13.252	3.600

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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2022	FY 2023	FY 2024
Decrease due to fact of life change in the program/project.			
Title: 12) PCAD Description: Product Development, Test and Evaluation, and Program Management. FY 2023 Plans: Evaluate prototype development under Science & Technology (S&T) activities, interagency collaboration with Defense Threat Reduction Agency (DTRA), and conduct developmental testing and program management activities. FY 2024 Plans: Transition breadboard prototypes from DTRA/Joint Science Technology Office to continue in the Technology Maturation Risk Reduction phase. Conduct advanced developmental testing of prototypes to execute an early user feedback assessment to include development testing with troops to support Milestone B plan in FY25. Continue program management and support activities to transition technologies from Science and Technology development to acquisition. FY 2023 to FY 2024 Increase/Decrease Statement: Increase supports technology maturation risk reduction activities (e.g. user touchpoint events, laboratory and background testing, technology readiness level assessments)and support schedule requirements to meet Milestone B in FY25.	-	0.918	8.487
Title: 13) SPCHAR-ENBD Description: Pathogenicity Studies. FY 2024 Plans: Initiate studies to investigate CBRN threat pathogenesis and/or pathogenicity models. FY 2023 to FY 2024 Increase/Decrease Statement: Additional investment in enhanced biodefense and pandemic preparedness.	-	-	2.000
Accomplishments/Planned Programs Subtotals	-	52.708	61.638

C. Other Program Funding Summary (\$ in Millions)											
<u>Line Item</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u> <u>Base</u>	<u>FY 2024</u> <u>OCO</u>	<u>FY 2024</u> <u>Total</u>	<u>FY 2025</u>	<u>FY 2026</u>	<u>FY 2027</u>	<u>FY 2028</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
• CA4: Contamination Avoidance (ACD&P)	37.189	-	-	-	-	-	-	-	-	0.000	37.189
• CA5: Contamination Avoidance (SDD)	84.967	-	-	-	-	-	-	-	-	0.000	84.967

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Chemical and Biological Defense Program **Date:** March 2023

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C. Other Program Funding Summary (\$ in Millions)

Line Item	FY 2022	FY 2023	FY 2024	FY 2024	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028	Cost To	
			Base	OCO	Total					Complete	Total Cost
• UN5: <i>Understand (SDD)</i>	-	126.071	182.726	-	182.726	137.991	127.671	108.908	68.088	Continuing	Continuing
• UN7: <i>Understand (Op Sys Dev)</i>	-	40.414	50.603	-	50.603	58.881	71.869	68.839	50.628	Continuing	Continuing
• SA0024: <i>Compact Vapor Chemical Agent Detector (CVCAD)</i>	-	-	-	-	-	-	0.585	8.200	22.144	Continuing	Continuing
• SA0050: <i>CBRN Support to C2 (CSC2)</i>	1.750	11.803	2.186	-	2.186	2.257	2.366	2.451	2.549	Continuing	Continuing
• SA0053: <i>Bio Defense Improvement Program (BDIP)</i>	-	-	-	-	-	-	3.917	17.356	31.850	Continuing	Continuing
• SA0054: <i>Advanced Differential Diagnostics (ADD)</i>	-	-	-	-	-	-	-	-	4.261	Continuing	Continuing

Remarks

D. Acquisition Strategy

Advanced Differential Diagnostics

The Advanced Differential Diagnostic program will utilize Other Transaction Authorization (OTA) project agreements to identify and mature commercial prototypes deemed technologically viable, and evaluate them in as realistic an operational environment as possible. Successful candidate systems will transition to the Engineering and Manufacturing Development phase to be further developed under the OTA agreement, in order to satisfy military and U.S. Food & Drug Administration (FDA) regulatory requirements for subsequent production and fielding to the Services.

ADVANCED AND EMERGING THREAT DEFENSE (AET DEFENSE)

The AET Defense program will use a variety of acquisition approaches to survey, develop, assess, and rapidly field technologies to inform and fill advanced and emerging threat defense capability gaps. The program will utilize existing Multiple Award Indefinite Delivery Indefinite Quantify Task Order Contracts to provide technical support to studies and assessments of performance against emerging threats. For Program of Record (PoR) systems currently in development that will be assessed for performance against emerging threats, those PoR's existing contracts will be modified to incorporate development engineering and test support for emerging threat capability. The AET Defense program will utilize OTAs for system development and prototyping activities and Government Agencies and Federally Funded Research and Development Centers to provide development, testing and technical support.

BIO DEFENSE IMPROVEMENT PROGRAM (BDIP)

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<p>BDIP will provide and integrate prototypes in cyclic prototyping plan cycles based on Service requirements. The prototyping plans will use a streamlined hybrid acquisition process in order to keep pace with industry and the rapid advancement of technologies. The BDIP strategy is to utilize the rapid prototyping process in Middle Tier Acquisition (MTA) enabled by the Other Transactional Agreements (OTA) contract vehicle. These prototypes will be demonstrated, evaluated and tested by the Services as well as laboratories and academia. Successful prototypes will be evaluated for transition to the platforms and Services for the next steps in acquisition, production and eventual fielding across the services. Funding provides market research to support the refinement and the building of technologically mature prototypes.</p> <p>Non-Targeted Sequencing Identification System</p> <p>The Non-targeted Sequencing Identification System (NSIS) program will utilize transitioned technology from the Defense Threat Reduction Agency (DTRA) Joint Science and Technology Office, as well as the Joint Project Manager Special Operations Forces Far-Forward Biological Sequencer (FFBS) to develop and assess sequencing commercial off-the-shelf (COTS) solutions to determine the most appropriate sequencer for use in Joint Service operations. Program Office will purchase test articles and conduct Developmental Testing with Joint Force end users to evaluate genomic sequencing capabilities.</p> <p>Physiological Monitoring Sensor Suite</p> <p>PM2S will follow a presumed software acquisition pathway to harden, test, and evaluate multiple CBRN-focused physiological predictive software algorithms for deployment across the Joint force. The program will leverage a variety of contracting approaches to support algorithm development to include OTAs, FAR based awards and Federally Funded Research and Development Centers.</p> <p>Colorimetric Indicator</p> <p>The Colorimetric Indicator (C-IND) program will work with the Defense Threat Reduction Agency on a joint Other Transactional Authority contract to transition technologies from Science and Technology to Acquisition. The program will work with community to refine requirements and development of test fixture to analyze potential capabilities.</p> <p>CBRN SUPPORT TO C2 (CSC2)</p> <p>CSC2 is executed through the Software Acquisition Pathway, leveraging existing Information Technology Box requirements and Capability Needs Statements (CNS) furnished through the Services and Combatant Commands. CSC2 is executing a modular contracting approach, where the use of Other Transaction Authorities (OTAs), and indefinite delivery/indefinite quantity (IDIQ) will be used to meet agile software objectives of continuous development, integration, delivery, and engineering. CSC2 will establish a Service and Joint All-Domain Command and Control (JADC2) compatible CBRN Common Operating Environment (COE) architecture and leverage existing enterprise Develop Security Operations (DevSecOps) efforts to facilitate continuous and iterative delivery of capability to the Joint Force through the development of a unified software solution.</p> <p>COMPACT VAPOR CHEMICAL AGENT DETECTOR (CVCAD)</p>		

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The CVCAD program will use the Combating Weapons of Mass Destruction Other Transaction Authority (CWMD OTA) contract vehicle to transition four technologies from Science & Technology (S&T) into the program of record. This streamlined acquisition approach is broken into four phases; Phase I S&T advanced development, Phase II technology transition maturation evaluation, Phase III competitive prototyping down select and Engineering decision. CVCAD will brief Acquisition Steering Panel (ASP) in 2QFY23 to inform milestone decision and prepare for next milestone, Milestone B or Middle Tier Acquisition (MTA). Phase IV will execute Production and Development for low rate initial production (LRIP) systems. CVCAD will procure full rate production (FRP) items through a follow-on Federal Acquisition Regulation based contract.

PROXIMATE CHEMICAL AGENT DETECTOR (PCAD)

PCAD will leverage the existing S&T CWMD OTA contract in FY24 to procure prototypes for Technology Maturation Risk Reduction (TMRR) phase. This streamlined approach will use one contracting mechanism to transition technology from S&T to acquisition and allow follow-on acquisitions up through Low Rate Initial Production. PCAD will procure full rate production (FRP) items through a follow-on Federal Acquisition Regulation based contract.

SURVEILLANCE AND PATHOGEN CHARACTERIZATION-ENHANCED BIODEFENSE (SPCHAR-ENBD)

SPCHAR ENBD is an investment program that will leverage interagency partners and existing contracts to investigate disease progression and measure biomarkers of selected CBRN threat agents to inform medical defense against biological warfare threats. The tailored acquisition pathway will allow flexibility to counter new an emerging biothreats.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Chemical and Biological Defense Program **Date:** March 2023

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Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
ADD - HW C - Product Management	Various	Various : N/A	-	0.000		0.000		1.938	Dec 2023	-		1.938	Continuing	Continuing	0.000
ADD - HW C - Product Development	C/CPFF	TBD : N/A	-	0.000		0.000		6.950	Mar 2024	-		6.950	Continuing	Continuing	0.000
AET DEFENSE - HW C - Emerging threat detection/ decontamination/protection capability prototyping	MIPR	Various : N/A	-	0.000		0.444	Feb 2023	0.888	Jan 2024	-		0.888	Continuing	Continuing	0.000
AET DEFENSE - HW C - Detection/Decon/ Protection	MIPR	Various : N/A	-	0.000		0.900	May 2023	0.750	Feb 2024	-		0.750	Continuing	Continuing	0.000
AET DEFENSE - SW C - Hazard awareness tool updates	MIPR	Various : N/A	-	0.000		0.500	Apr 2023	0.000		-		0.000	0.000	0.500	0.000
AET DEFENSE - HW C - Emerging Threat Detection	C/CPFF	Johns Hopkins University - Applied Physics Laboratory : Laurel, MD	-	0.000		0.000		0.600	Apr 2024	-		0.600	Continuing	Continuing	0.000
BDIP - HW C - Tabletop Exercise - User Feedback Support	MIPR	Various : N/A	-	0.000		0.368	Oct 2022	0.000		-		0.000	0.000	0.368	0.000
BDIP - HW C - Surveillance and Pathogen Characterization (Genomic Sequencing)	MIPR	U.S. Army Combat Capabilities Development Command (DEVCOM) Chemical Biological Center (CBC) : Aberdeen Proving Ground, MD	-	0.000		1.709	Oct 2022	0.000		-		0.000	0.000	1.709	0.000
NSIS - HW C - COTS Oxford Nanopore MinION Genomic Sequencers and Flow Cells	MIPR	TBD : N/A	-	0.000		0.000		0.215	Dec 2023	-		0.215	Continuing	Continuing	0.000

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Chemical and Biological Defense Program **Date:** March 2023

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Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
PM2S - SW C - Physiological Algorithm Development	Various	Various : N/A	-	0.000		0.000		1.000	Dec 2023	-		1.000	Continuing	Continuing	0.000
C-IND - HW S - Initial Product Planning	Various	Various : N/A	-	0.000		0.000		0.664	Nov 2023	-		0.664	Continuing	Continuing	0.000
CSC2 - SW S - Government Product Development Team Labor	MIPR	Various : N/A	-	0.000		1.963	Oct 2022	2.028	Dec 2023	-		2.028	Continuing	Continuing	0.000
CSC2 - SW S - Operational Capability	C/CPAF	Various : N/A	-	0.000		19.816	Oct 2022	11.869	Dec 2023	-		11.869	Continuing	Continuing	0.000
CSC2 - HW S - Contractor Product Development Team Labor	MIPR	JPEO Chem, Bio, Rad, and Nuc Defense (JPEO-CBRND) : Aberdeen Proving Ground, MD	-	0.000		0.491	Oct 2022	1.846	Dec 2023	-		1.846	Continuing	Continuing	0.000
CSC2 - SW S - Service CoE and CE Convergence	MIPR	Various : N/A	-	0.000		4.540	Oct 2022	1.200	Dec 2023	-		1.200	Continuing	Continuing	0.000
CVCAD - HW S - Advanced Prototype Development	C/FFP	Advanced Technologies International : Summerville, SC	-	0.000		6.420	Apr 2023	1.620	Jan 2024	-		1.620	Continuing	Continuing	0.000
PCAD - HW S - Government Team Labor	Various	Various : N/A	-	0.000		0.000		0.581	Nov 2023	-		0.581	Continuing	Continuing	0.000
PCAD - HW S - Advanced Prototype Development	C/FFP	Advanced Technologies International : Summerville, SC	-	0.000		0.000		4.808	Nov 2023	-		4.808	Continuing	Continuing	0.000
SPCHAR-ENBD - Pathogenicity Studies	Various	Various : N/A	-	0.000		0.000		1.678	Dec 2023	-		1.678	Continuing	Continuing	0.000
SPCHAR-ENBD - Direct Product Support	Various	Various : N/A	-	0.000		0.000		0.147	Dec 2023	-		0.147	Continuing	Continuing	0.000
Subtotal			-	0.000		37.151		38.782		-		38.782	Continuing	Continuing	N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Chemical and Biological Defense Program **Date:** March 2023

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603884BP / Chemical and Biological Defense Program - Dem/Val	Project (Number/Name) UN4 / Understand (ACD&P)
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Support (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
AET DEFENSE - ES C - Engineering support to evaluating, assessing, and designing capabilities	MIPR	Various : N/A	-	0.000		0.000		0.465	Jan 2024	-		0.465	Continuing	Continuing	0.000
NSIS - ES C - OGA Matrix Labor	MIPR	U.S. Army Combat Capabilities Development Command (DEVCOM) Chemical Biological Center (CBC) : Aberdeen Proving Ground, MD	-	0.000		0.000		0.108	Dec 2023	-		0.108	Continuing	Continuing	0.000
C-IND - Program Support Costs	Various	Various : N/A	-	0.000		0.000		0.075	Nov 2023	-		0.075	Continuing	Continuing	0.000
CSC2 - ES C - Contractor Support	C/CPFF	TBD : N/A,	-	0.000		0.885	Oct 2022	0.768	Nov 2023	-		0.768	Continuing	Continuing	0.000
CSC2 - ES C - Support	MIPR	TBD : N/A,	-	0.000		0.775	Feb 2023	4.551	Mar 2024	-		4.551	Continuing	Continuing	0.000
CVCAD - ES S - OGA Support	MIPR	Various : N/A	-	0.000		2.476	Apr 2023	1.000	Jan 2024	-		1.000	Continuing	Continuing	0.000
PCAD - ES S - OGA Support	MIPR	Various : N/A	-	0.000		0.485	Apr 2023	0.750	Nov 2023	-		0.750	Continuing	Continuing	0.000
Subtotal			-	0.000		4.621		7.717		-		7.717	Continuing	Continuing	N/A

Test and Evaluation (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
AET DEFENSE - DTE C - Technology Assessments	MIPR	U.S. Army Combat Capabilities Development Command (DEVCOM) Chemical Biological Center	-	0.000		0.517	Feb 2023	1.750	Jan 2024	-		1.750	Continuing	Continuing	0.000

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Chemical and Biological Defense Program												Date: March 2023		
Appropriation/Budget Activity 0400 / 4						R-1 Program Element (Number/Name) PE 0603884BP / Chemical and Biological Defense Program - Dem/Val				Project (Number/Name) UN4 / Understand (ACD&P)				

Test and Evaluation (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract	
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost				
		(CBC) : Aberdeen Proving Ground, MD														
AET DEFENSE - DTE C - Technology Assessments	MIPR	Various : N/A	-	0.000		0.000		0.651	Mar 2024	-		0.651	Continuing	Continuing	0.000	
AET DEFENSE - DTE C - Technology Assessments	C/CPFF	Johns Hopkins University - Applied Physics Laboratory : Laurel, MD	-	0.000		0.000		0.650	Apr 2024	-		0.650	Continuing	Continuing	0.000	
NSIS - DTE C - Tactics, Techniques & Procedures	MIPR	U.S. Army Combat Capabilities Development Command (DEVCOM) Chemical Biological Center (CBC) : Aberdeen Proving Ground, MD	-	0.000		0.000		0.265	Dec 2023	-		0.265	Continuing	Continuing	0.000	
C-IND - DTE S - Initial Test Fixture	Various	Various : N/A	-	0.000		0.000		0.200	Nov 2023	-		0.200	Continuing	Continuing	0.000	
CSC2 - OTE S - Technical/Operational Demo	MIPR	TBD : N/A,	-	0.000		2.548	Feb 2023	2.801	Dec 2023	-		2.801	Continuing	Continuing	0.000	
CVCAD - DTE S - MIL STD/Surety Testing	MIPR	Various : N/A	-	0.000		1.981	Aug 2023	0.620	Jan 2024	-		0.620	Continuing	Continuing	0.000	
CVCAD - DTE S - Vapor Testing	MIPR	MRIGlobal : Kansas City, MO	-	0.000		0.700	Apr 2023	0.000		-		0.000	0.000	0.700	0.000	
PCAD - DTE S - Technology Readiness Evaluation	MIPR	U.S. Army Combat Capabilities Development Command (DEVCOM) Chemical Biological Center (CBC) : Aberdeen Proving Ground, MD	-	0.000		0.348	Apr 2023	1.500	Nov 2023	-		1.500	Continuing	Continuing	0.000	
Subtotal			-	0.000		6.094		8.437		-		8.437	Continuing	Continuing	N/A	

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Chemical and Biological Defense Program **Date:** March 2023

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603884BP / Chemical and Biological Defense Program - Dem/Val	Project (Number/Name) UN4 / Understand (ACD&P)
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Management Services (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
ADD - PM/MS S - Management Services	Various	Various : N/A	-	0.000		0.000		1.099	Dec 2023	-		1.099	Continuing	Continuing	0.000
AET DEFENSE - PM/MS S - IPT Support/Program Management	MIPR	U.S. Army Combat Capabilities Development Command (DEVCOM) Chemical Biological Center (CBC) : Aberdeen Proving Ground, MD	-	0.000		0.431	Dec 2022	0.875	Dec 2023	-		0.875	Continuing	Continuing	0.000
BDIP - PM/MS S - Program Management Support	MIPR	Various : N/A	-	0.000		0.321	Oct 2022	0.000		-		0.000	0.000	0.321	0.000
NSIS - PM/MS S - Program Management Support	MIPR	Various : N/A	-	0.000		0.000		0.065	Dec 2023	-		0.065	Continuing	Continuing	0.000
PM2S - PM/MS C - Management for Algorithm Development	MIPR	Various : N/A	-	0.000		0.000		0.200	Nov 2023	-		0.200	Continuing	Continuing	0.000
C-IND - PM/MS C - Program Management Support	Various	Various : N/A	-	0.000		0.000		0.104	Nov 2023	-		0.104	Continuing	Continuing	0.000
CSC2 - PM/MS C - Program Management Support	MIPR	Various : N/A	-	0.000		2.330	Oct 2022	2.976	Nov 2023	-		2.976	Continuing	Continuing	0.000
CVCAD - PM/MS S - Program Management Support	MIPR	Various : N/A	-	0.000		1.675	Feb 2023	0.360	Jan 2024	-		0.360	Continuing	Continuing	0.000
PCAD - PM/MS S - Program Management	MIPR	Various : N/A	-	0.000		0.085	Mar 2023	0.848	Nov 2023	-		0.848	Continuing	Continuing	0.000
SPCHAR-ENBD - PM/MS SB - Management Support	Various	Various : N/A	-	0.000		0.000		0.175	Dec 2023	-		0.175	Continuing	Continuing	0.000
Subtotal			-	0.000		4.842		6.702		-		6.702	Continuing	Continuing	N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Chemical and Biological Defense Program								Date: March 2023			
Appropriation/Budget Activity 0400 / 4				R-1 Program Element (Number/Name) PE 0603884BP / <i>Chemical and Biological Defense Program - Dem/Val</i>				Project (Number/Name) UN4 / <i>Understand (ACD&P)</i>			
	Prior Years	FY 2022	FY 2023		FY 2024 Base	FY 2024 OCO	FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract	
Project Cost Totals	-	0.000	52.708		61.638	-	61.638	Continuing	Continuing	N/A	

Remarks

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Exhibit R-4, RDT&E Schedule Profile: PB 2024 Chemical and Biological Defense Program		Date: March 2023
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603884BP / <i>Chemical and Biological Defense Program - Dem/Val</i>	Project (Number/Name) UN4 / <i>Understand (ACD&P)</i>

	FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027				FY 2028			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
ADD - MDD-Materiel Development Decision																												
ADD - MS A-Milestone A																												
ADD - Technology Maturation and Risk Reduction (TMRR)																												
ADD - MS B-Milestone B																												
ADD - Engineering & Manufacturing Development (EMD)																												
AET DEFENSE - Technology Assessments/ Systems Engineering																												
BDIP - Tabletop Exercise - User Feedback Support																												
BDIP - Surveillance and Pathogen Characterization (Genomic Sequencing)																												
NSIS - CDD Validation-Capability Development Document Validation - Requirements Documentation for Joint Force genomic sequencing capability																												
NSIS - MS B-Milestone B - Program Initiation at MS B																												
NSIS - DT&E-Developmental Test and Evaluation - National Guard Bureau testing on proficiency samples and tactics, techniques, and procedures development																												
PM2S - CDD Validation-Capability Development Document Validation																												
PM2S - Systems Engineering/Program Management																												
PM2S - Software Development & Integration																												

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Exhibit R-4, RDT&E Schedule Profile: PB 2024 Chemical and Biological Defense Program **Date:** March 2023

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603884BP / <i>Chemical and Biological Defense Program - Dem/Val</i>	Project (Number/Name) UN4 / <i>Understand (ACD&P)</i>
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	FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027				FY 2028			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
C-IND - Pre-Milestone A																												
CSC2 - SWP Execution Phase Decision																												
CSC2 - Continuous Software DT/OT																												
CSC2 - MVP (CDP-1)																												
CSC2 - Service Common Operating Environment Integration																												
CSC2 - Cyber Security Compliance																												
CSC2 - CD-Capability Drop - MVCR Delivery 1 (CDP-1)																												
CSC2 - MVP (CDP-2)																												
CSC2 - Continuous Engineering & Software Updates																												
CSC2 - Operating System Architecture Updates																												
CSC2 - CD-Capability Drop - MVCR Delivery 2 (CDP-2)																												
CSC2 - Future MVPs																												
CSC2 - CD-Capability Drop - Future MVCR Deliveries																												
CVCAD - CDD Validation-Capability Development Document Validation																												
CVCAD - MS B-Milestone B																												
CVCAD - CDR-Critical Design Review																												
CVCAD - CDD Update																												
CVCAD - MS C-Milestone C																												
CVCAD - LRIP-Low Rate Initial Production																												
CVCAD - FRP-Full Rate Production Decision																												

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Chemical and Biological Defense Program		Date: March 2023
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603884BP / <i>Chemical and Biological Defense Program - Dem/Val</i>	Project (Number/Name) UN4 / <i>Understand (ACD&P)</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
ADD - MDD-Materiel Development Decision	2	2024	2	2024
ADD - MS A-Milestone A	2	2024	2	2024
ADD - Technology Maturation and Risk Reduction (TMRR)	2	2024	2	2026
ADD - MS B-Milestone B	2	2026	2	2026
ADD - Engineering & Manufacturing Development (EMD)	2	2026	4	2028
AET DEFENSE - Technology Assessments/Systems Engineering	1	2022	4	2028
BDIP - Tabletop Exercise - User Feedback Support	1	2024	4	2024
BDIP - Surveillance and Pathogen Characterization (Genomic Sequencing)	3	2023	4	2024
NSIS - CDD Validation-Capability Development Document Validation - Requirements Documentation for Joint Force genomic sequencing capability	4	2023	1	2024
NSIS - MS B-Milestone B - Program Initiation at MS B	1	2024	1	2024
NSIS - DT&E-Developmental Test and Evaluation - National Guard Bureau testing on proficiency samples and tactics, techniques, and procedures development	2	2024	4	2024
PM2S - CDD Validation-Capability Development Document Validation	2	2023	2	2023
PM2S - Systems Engineering/Program Management	2	2024	4	2028
PM2S - Software Development & Integration	2	2024	4	2025
C-IND - Pre-Milestone A	1	2024	4	2024
CSC2 - SWP Execution Phase Decision	2	2023	2	2023
CSC2 - Continuous Software DT/OT	3	2023	4	2028
CSC2 - MVP (CDP-1)	4	2023	4	2023
CSC2 - Service Common Operating Environment Integration	1	2024	4	2028
CSC2 - Cyber Security Compliance	1	2024	4	2028
CSC2 - CD-Capability Drop - MVCR Delivery 1 (CDP-1)	4	2024	4	2025

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Chemical and Biological Defense Program **Date:** March 2023

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603884BP / <i>Chemical and Biological Defense Program - Dem/Val</i>	Project (Number/Name) UN4 / <i>Understand (ACD&P)</i>
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Events	Start		End	
	Quarter	Year	Quarter	Year
CSC2 - MVP (CDP-2)	4	2024	4	2024
CSC2 - Continuous Engineering & Software Updates	1	2025	4	2028
CSC2 - Operating System Architecture Updates	1	2025	4	2028
CSC2 - CD-Capability Drop - MVCR Delivery 2 (CDP-2)	4	2025	4	2026
CSC2 - Future MVPs	2	2026	4	2028
CSC2 - CD-Capability Drop - Future MVCR Deliveries	4	2026	4	2028
CVCAD - CDD Validation-Capability Development Document Validation	3	2023	3	2023
CVCAD - MS B-Milestone B	4	2023	4	2023
CVCAD - CDR-Critical Design Review	3	2024	3	2024
CVCAD - CDD Update	3	2025	3	2025
CVCAD - MS C-Milestone C	4	2025	4	2025
CVCAD - LRIP-Low Rate Initial Production	4	2026	4	2026
CVCAD - FRP-Full Rate Production Decision	4	2027	4	2027
CVCAD - IOC-Initial Operational Capability	4	2028	4	2028
CVCAD - FOC-Full Operational Capability	4	2028	4	2028
PCAD - MS C-Milestone C	4	2027	4	2027
PCAD - LRIP-Low Rate Initial Production	4	2027	4	2028
PCAD - Draft CDD	2	2024	2	2024
PCAD - MS A-Milestone A	3	2024	3	2024
PCAD - MS B-Milestone B	1	2027	1	2027
SPCHAR-ENBD - Pathogenicity Studies	1	2023	2	2024

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Chemical and Biological Defense Program **Date:** March 2023

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603884BP / <i>Chemical and Biological Defense Program - Dem/Val</i>	Project (Number/Name) PT4 / <i>Protect (ACD&P)</i>
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COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
PT4: <i>Protect (ACD&P)</i>	-	0.000	175.219	179.158	0.000	179.158	135.096	107.341	123.538	139.376	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Protect Advanced Component Development and Prototypes (ACD&P) Project provides the ability to shield the Joint Force from harm caused by Chemical Biological Radiological and Nuclear (CBRN) hazards by preventing or reducing individual and collective exposures, applying prophylaxis to prevent or mitigate negative physiological effects, and protecting critical equipment. In FY 2023, the Chemical Biological Defense Program (CBDP) RDT&E Projects were restructured to align with the CBDP portfolio construct. PT4 efforts in FY 2022 remain in Projects IP4, MB4, and TM4. This restructuring provided standardization and alignment across CBDP research, development and acquisition efforts.

Efforts included in this Project are:

- (1) Accelerated Antibodies-Enhanced Biodefense (AA-ENBD)
- (2) Biological Warfare Defense Prototype (BIOPROTO)
- (3) Generative Unconstrained Intelligent Drug Engineering-Enhanced Biodefense (GUIDE-ENBD)
- (4) Medical Countermeasure Platform Technologies (MCMPT)
- (5) Plague Monoclonal Antibodies (PLG MAB)
- (6) Uniform Integrated Protective Ensemble Family of Systems Footwear (UIPE FoS Footwear)
- (7) Vaccine Acceleration by Modular Progression-Enhanced Biodefense (VAMP-ENBD)

The Accelerated Antibodies - Enhanced Biodefense (AA-ENBD) will develop prophylactic and therapeutic monoclonal antibody (mAb) Medical Countermeasure (MCM) against a broad range of biological threats. Funded in FY22 as COVID Therapies Monoclonal Antibodies (COVID TX MAB), this is a continuation which will target the discovery, identification and small scale manufacture of mAbs with sufficient material to support non-clinical and clinical testing. Sufficient doses will be produced and maintained for potential use in emergency response situations. AA-ENBD was formerly known as Monoclonal Antibodies Therapeutics-Enhanced Biodefense (MAB TX-ENBD).

The Biological Warfare Defense Prototype (BIOPROTO) supports early-phase clinical development and supporting non-clinical safety, tolerability and toxicity data for candidate vaccines and therapeutic drugs prior to transition to System Development & Demonstration. This work provides safe and effective medical defense against validated biological threat agents and emerging infectious disease biothreats including bacteria, toxins, and viruses. This work also involves the evaluation of Food and Drug Administration (FDA) approved therapeutics for operational use, as well as generation of novel drug products and formulations, to enhance level of protection and/or operational utility for the Warfighter. This effort reduces programmatic risk of failure in the advanced development phase.

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Chemical and Biological Defense Program	Date: March 2023
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Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603884BP / <i>Chemical and Biological Defense Program - Dem/Val</i>	Project (Number/Name) PT4 / <i>Protect (ACD&P)</i>
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The Generative Unconstrained Intelligent Drug Engineering - Enhanced Biodefense (GUIDE-ENBD) is an intelligent drug design and engineering system intended to decrease product development risk throughout the medical countermeasure development life cycle, accelerate candidate development, and enable preemptive preparedness and rapid response. GUIDE impacts the discovery and design of biologics products (e.g., monoclonal antibodies and vaccines) and small molecule drugs through a multi-faceted optimization process capturing critical quality attributes of safety, efficacy, manufacturability and pharmacokinetics/pharmacodynamics (PK/PI). Furthermore, GUIDE incorporates computational approaches to manufacturing controls and preclinical/clinical testing. GUIDE is a collaboration between the interagency, academia and industry partners and is integrated to the Accelerated Antibodies and RNA vaccine (VAMP) programs. In FY24 GUIDE will continue to develop a fully integrated computational approach to accelerating medical countermeasure development.

The Medical Countermeasure Platform Technologies (MCMPT) program streamlines and accelerates delivery of medical countermeasure to the Warfighter against known and emerging biological threats by establishing mature platform technologies that allow for rapid response and by reducing developmental risks. MCMPT is establishing enabling technologies and prepositioning platform systems within the Department of Defense (DoD)'s Advanced Development Manufacturing (ADM) network using standardized discovery, design, manufacturing, and testing processes to reduce the medical countermeasure (MCM) development risks. MCMPT will deliver an enduring capability from which future candidates can be manufactured.

The Plague Monoclonal Antibodies (PLG MAB) program was transitioned in FY2023 from MCMPT Advanced Development and Manufacturing of Antibody Technology (ADAMANT), PLG MAB will provide a pre-exposure monoclonal antibody product to protect the Warfighter from aerosolized plague and is intended for intramuscular route of administration. This capability is complementary to plague therapeutics and will provide a continuum of protection against plague bacteria. In FY24 PLG MAB continues monoclonal antibody discovery and half-life extensions to produce product to support a Phase 1 clinical study.

The Uniform Integrated Protective Ensemble Family of Systems Footwear (UIPE FoS Footwear) will provide the warfighter with percutaneous protection against liquid, vapor, dust, particulate, or sporulated toxic material, chemical and biological warfare agents and radiological fallout particles when worn as part of the Uniform Individual Protection Ensemble (UIPE). In FY24 UIPE FoS Footwear will initiate prototype development to evaluate up to ten footwear alternatives, conduct chemical agent swatch testing to inform initial down select of alternatives, conduct limited early user testing to garner feedback on service preferred alternatives and generate documentation for Milestone B 2QFY25.

The Vaccine Acceleration by Modular Progression - Enhanced Biodefense (VAMP-ENBD) will leverage lessons learned to shorten future emergency response timelines, mitigate impacts of biological threat outbreaks, and create interim capabilities to protect the Warfighter. Leveraging interagency, industry, and academia partnership, VAMP will continue to build the Warfighter's bio-armor to protect against biological threat families. VAMP will continue to develop alternative vaccine platform technologies and manage awards utilizing go/no-go checkpoints along the development pathway.

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2022	FY 2023	FY 2024
<p>Title: 1) AA-ENBD</p> <p>Description: This effort will focus on Accelerated Antibody Development and Production. Target the discovery, identification and small scale manufacture of monoclonal antibodies (mAbs) for 2 additional prototypes, with sufficient material to support non-clinical and clinical testing.</p>	-	59.000	67.664

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Chemical and Biological Defense Program		Date: March 2023
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603884BP / <i>Chemical and Biological Defense Program - Dem/Val</i>	Project (Number/Name) PT4 / <i>Protect (ACD&P)</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2022	FY 2023	FY 2024
<p><i>FY 2023 Plans:</i> Initiate Nonclinical Investigational New Drug (IND) enabling testing for the first 2 prototypes.</p> <p><i>FY 2024 Plans:</i> Initiate phase 1 clinical studies for the first 2 mAb products and complete large scale manufacturing of 5-10K phase 2 compliant doses to transfer into the Rapid Access to Products In Development (RAPID) program for the first 2 mAb products. Initiate manufacturing scale up and nonclinical testing for mAb product #3. Initiate mAb product #4 in conjunction with GUIDE Live Fire Exercise.</p> <p><i>FY 2023 to FY 2024 Increase/Decrease Statement:</i> Minor change due to routine program adjustments.</p>			
<p><i>Title:</i> 2) BIOPROTO</p> <p><i>Description:</i> BIOPROTO supports early-phase clinical development and supporting non-clinical safety, tolerability and toxicity data for candidate vaccines and therapeutic drugs prior to transition to System Development & Demonstration. This work provides safe and effective medical defense against validated biological threat agents and emerging infectious disease biotreats including bacteria, toxins, and viruses. This work also involves the evaluation of Food and Drug Administration (FDA)-approved therapeutics for operational use, as well as generation of novel drug products and formulations, to enhance level of protection and/or operational utility for the Warfighter. This effort reduces programmatic risk of failure in the advanced development phase.</p> <p><i>FY 2023 Plans:</i> - Complete human melioidosis clinical trial and continue Non-Human Primate (NHP) studies to establish efficacy of broad spectrum antibacterial candidate. Ready candidate for transition to Biomedical Advanced Research and Development Authority (BARDA). - Complete testing of broad spectrum antiviral in endemic Lassa fever disease and prepare to transition to advanced developer.</p> <p><i>FY 2023 to FY 2024 Increase/Decrease Statement:</i> Program/project funding transferred to another funding line. FY 2024 funding has been transferred to Project PT3 for better alignment under budget activity 3.</p>	-	2.573	-
<p><i>Title:</i> 3) GUIDE-ENBD</p> <p><i>Description:</i> This effort will focus on Generative Unconstrained Intelligent Drug Engineering. Developing and implementing a fully integrated computational approach to accelerating medical countermeasure development.</p> <p><i>FY 2023 Plans:</i></p>	-	55.000	49.633

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Chemical and Biological Defense Program **Date:** March 2023

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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2022	FY 2023	FY 2024
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Develop and implement a fully integrated computational approach to accelerating medical countermeasure development by improving computational predictions of antibody-antigen interactions and affinity (strength of interaction), incorporating the ability to address manufacturing-related properties to include a panel of manufacturing tools, expanding the safety models to ensure selected candidates do not have known issues such as anti-drug antibodies and screening for polyreactive antibodies, and starting vaccine design modeling and technologies

FY 2024 Plans:
Execute medical countermeasure design campaigns to discover prototypes for up to 3 distinct threat families. Iterate the planning, coding, building, and testing of up to 17 new and existing digital tools and algorithms to increase speed and accuracy of computational MCM discovery efforts and rapid response capability; Conduct Live Fire Exercise against an unknown target, countermeasure will be transferred to Accelerated Antibodies program for development and testing.

FY 2023 to FY 2024 Increase/Decrease Statement:
Decrease due to transition from development of computational tools to refinement of those computational tools.

Title: 4) MCMPT Description: Manufacturing FY 2023 Plans: Initiate Digital Twin program to develop Artificial Intelligence models for manufacturing process controls to improve efficiency by reducing human intervention and control inputs. FY 2024 Plans: Continue refining Digital Twin Artificial Intelligence models for manufacturing process controls to reduce human interventions and increase process efficiency. FY 2023 to FY 2024 Increase/Decrease Statement: Minor change due to routine program adjustments. Effort concludes in FY24.	-	4.794	1.200
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Title: 5) MCMPT Description: Rapid Response FY 2023 Plans: Initiate Pandemic Prevention Platform (P3) transfer from Defense Advanced Research Projects Agency (DARPA) to mature disease-agnostic antibody platform which will be further developed by the AA-ENBD or GUIDE-ENBD programs. FY 2024 Plans:	-	5.774	5.076
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Exhibit R-2A, RDT&E Project Justification: PB 2024 Chemical and Biological Defense Program		Date: March 2023		
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B. Accomplishments/Planned Programs (\$ in Millions)		FY 2022	FY 2023	FY 2024
Continue refining Pandemic Prevention Platform (P3) capability to discover/optimize antigens against known and emerging threats to be further developed under AA-ENBD or GUIDE-ENBD programs for monoclonal and vaccine countermeasures and stored within the Rapid Access to Products in Development (RAPID) program. FY 2023 to FY 2024 Increase/Decrease Statement: Minor change due to routine program adjustments.				
Title: 6) MCMPT Description: Nucleic Acid FY 2024 Plans: Initiate the transfer of DARPA gene-encoded Deoxyribonucleic Acid (DNA) or Ribonucleic Acid (RNA) based medical countermeasure platform. This new technology will enhance both the onset of protection and duration of protection for a pre-exposure countermeasure against chemical/biological threats. Initiate transition of DARPA Nucleic Acid on Demand (NOW) manufacturing capability. This capability eliminates outsourcing of lengthy prototype manufacturing to allow programs such as GUIDE to test and evaluate more candidates real time. FY 2023 to FY 2024 Increase/Decrease Statement: Increase due to change in program/project technical parameters.		-	-	4.200
Title: 7) PLG MAB Description: Manufacturing, Non-Clinical and Clinical Development FY 2023 Plans: Initiate Small Model and At Scale Manufacturing development for Phase 1 Study. Continue in the discovery of Plague monoclonal antibodies (mAbs) . These efforts initiate Half-Life Extension to extend half-life candidate mAbs to meet service requirements. To include initiating Assay Development to provide validated assay support to manufacturing and Phase 1 study, and Conduct Primate Proof of Concept Study to demonstrate efficacy in Non-human primates using aerosol challenge. FY 2024 Plans: Continue large scale manufacturing to support the Phase I clinical study and delivery of 5-10K doses of Phase 2 compliant material to Rapid Access to Products in Development (RAPID) program for an Interim Fielding Capability. Complete Non-Human Primate (NHP) Pharmacokinetics (PK)/Efficacy studies, small animal model toxicology studies and initiate Phase 1 clinical study to support Milestone B in FY25. FY 2023 to FY 2024 Increase/Decrease Statement:		-	13.078	14.700

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Chemical and Biological Defense Program		Date: March 2023
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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2022	FY 2023	FY 2024
Increase due to start of phase 1 study and ramp up of large scale manufacturing.			
Title: 8) UIPE FoS Footwear Description: Development of the UIPE FoS Footwear System FY 2024 Plans: Initiate prototype Other Transaction Authority (OTA) to evaluate up to ten footwear alternatives, conduct chemical agent swatch testing to inform initial down select of alternatives, conduct limited early user testing to garner feedback on service preferred alternatives and generate documentation for Milestone B 2QFY25. FY 2023 to FY 2024 Increase/Decrease Statement: UIPE FoS Footwear is a new effort within the UIPE Family of Systems starting in FY24.	-	-	2.386
Title: 9) VAMP-ENBD Description: Focus on Vaccine Acceleration by Modular Progression (VAMP), leveraging established commercial biotechnology manufacturing processes and interagency partners [e.g., Biomedical Advanced Research and Development Authority (BARDA), Defense Innovation Unit (DIU)] to support development of vaccine(s) against priority threats to the warfighter. FY 2023 Plans: Continue vaccine development to produce vaccine(s) against priority threats. FY 2024 Plans: Continue development and manufacturing of vaccine candidates against multiple viral biothreats. Continue test and evaluation efforts in animals and human clinical trials. FY 2023 to FY 2024 Increase/Decrease Statement: Minor change due to routine program adjustments.	-	35.000	34.299
Accomplishments/Planned Programs Subtotals	-	175.219	179.158

C. Other Program Funding Summary (\$ in Millions)

Line Item	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
• MB4: Medical Biological Defense (ACD&P)	46.791	-	-	-	-	-	-	-	-	0.000	46.791
• MB5: Medical Biological Defense (SDD)	138.156	-	-	-	-	-	-	-	-	0.000	138.156

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Chemical and Biological Defense Program **Date:** March 2023

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603884BP / <i>Chemical and Biological Defense Program - Dem/Val</i>	Project (Number/Name) PT4 / <i>Protect (ACD&P)</i>
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C. Other Program Funding Summary (\$ in Millions)

Line Item	FY 2022	FY 2023	FY 2024	FY 2024	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028	Cost To	
			Base	OCO	Total					Complete	Total Cost
• MT4: <i>Mitigate (ACD&P)</i>	-	17.302	28.785	-	28.785	20.885	15.433	13.369	-	Continuing	Continuing
• PT2: <i>Protect (Applied Research)</i>	-	58.091	55.057	-	55.057	56.153	57.817	61.452	61.452	Continuing	Continuing
• PT5: <i>Protect (SDD)</i>	-	87.923	97.975	-	97.975	69.858	66.259	52.871	67.776	Continuing	Continuing

Remarks

D. Acquisition Strategy

ACCELERATED ANTIBODIES-ENHANCED BIODEFENSE (AA-ENBD)

AA-ENBD, in collaboration with interagency partners at Biomedical Advanced Research and Development Authority (BARDA) & Defense Advanced Research Projects Agency (DARPA), will address multiple high-priority threats by developing antibody solutions and advancing them through Phase 1 clinical trials by 2028. Additionally, all necessary studies will be completed to enable advanced development, as desired. AA-ENBD will provide a stockpile of 5-10K doses that will remain on a stability program as a potential rapid response capability for deployment. Furthermore, a commercial manufacturing process will be leveraged and developed that can be rapidly implemented for a larger response if needed. The intention is to work each candidate to the appropriate regulatory level (e.g., through Phase 1) within a codified timeframe (e.g., 2 years) from initiation. These efforts will leverage the Other Transactions Authority (OTA) through the medical OTA consortium. AA-ENBD was formerly known as Monoclonal Antibodies Therapeutics-Enhanced Biodefense (MAB TX-ENBD).

GENERATIVE UNCONSTRAINED INTELLIGENT DRUG ENGINEERING-ENHANCED BIODEFENSE (GUIDE-ENBD)

GUIDE computational tools, to include artificial intelligence and machine learning, are tailored specifically to Warfighter threats and needs through a preemptive approach that broadly addresses a diverse and dynamic threat space. GUIDE's intelligent drug design enables medical countermeasures (MCM) candidates to be developed across a wider aperture of threat space thereby reducing early development time. MCM candidates, particularly in the case of high priority threats, can be advanced preemptively. The GUIDE program offers a revolutionary approach to addressing unanticipated endemic and engineered threats through rapid retargeting and optimization. GUIDE is a collaboration between the Joint Program Executive Office for Chemical, Biological, Radiological and Nuclear Defense (CBRND) (JPEO-CBRND), Defense Advanced Research Projects Agency (DARPA), and the Department of Energy (DOE). The GUIDE program is utilizing Interagency Agreements (IAA) with the DOE National Labs as well as a Other Transaction Authority (OTA) agreement for high throughput testing.

MCM PLATFORM TECHNOLOGIES (MCMPT)

The goal of the MCMPT is to rapidly counter a broad-spectrum of threat agents using standardized discovery, design, manufacturing, and testing processes to reduce the MCM development risks. Efforts will focus on transitioning S&T programs from other DoD agencies, such as the Defense Threat Reduction Agency (DTRA)-Joint Science and Technology Office (JSTO) or DARPA, and establishing advanced platform technologies within the Department of Defense (DoD)'s Advanced Development Manufacturing (ADM) network and evaluating that capability through nonclinical and clinical testing. A subset of these technologies, such as the DARPA Pandemic

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Chemical and Biological Defense Program	Date: March 2023
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Prevention Platform (P3), will be adapted to deliver a rapid response capability to novel and emerging threats. Once established, future programs will be able to leverage these platforms for the development of future medical countermeasures. It is anticipated that these efforts will leverage the Other Transactions Authority (OTA) through the medical OTA consortium, or Army Contracting Command-Edgewood.

PLAGUE MONOCLONAL ANTIBODIES (PLG MAB)

The Plague Monoclonal Antibodies (PLG MAB) program was initiated by the Medical Countermeasure Platform Technologies (MCMPT) program and continued using the Accelerated Antibodies contracting methodology Medical CBRN Defense Consortium Other Transaction Agreement (MCDC OTA). The program's Milestone Development Decision (MDD) was approved 26 OCT 2022. The program is now a Major Defense Acquisition Program (MDAP) and anticipates a Milestone (MS) B Decision point in 2025. Prior to MS B the program will conduct the necessary nonclinical and clinical testing and large-scale manufacturing needed to advance into the Engineering and Manufacturing Development Phase.

Uniform Integrated Protective Ensemble Family of Systems Footwear

The Uniform Integrated Protective Ensemble Family of Systems (UIPE FoS) Footwear program will use Other Transaction Authority for prototype production. The program will develop and assess multiple prototypes with an emphasis on a balance between cost, protection, schedule, risk and interoperability. Early user testing will include comparison to legacy boots as well as laboratory testing with boots that are contaminated, followed by operational and developmental test efforts in realistic operational environments. Using a gated test approach, the program will select multiple candidates at Milestone (MS) B using Cost As an Independent Variable (CAIV) to trade risk, requirements, and schedule to achieve the maximum value at a fixed cost. Rather than choose the top performance candidates, the program will select a low cost candidate that meets Key Performance Parameters (KPP) and high performance candidates constrained by maximum target costs. Results of prototyping will inform developmental and operational testing, followed by a down select prior to Critical Design Review (CDR) and production initiation at MS C using a Federal Acquisition Regulation (FAR) based production contract.

VACCINE ACCELERATION BY MODULAR PROGRESSION-ENHANCED BIODEFENSE (VAMP-ENBD)

The Vaccine Acceleration by Modular Progression (VAMP) program is an investment program that leverages lessons learned, industrial leaders, established manufacturing processes, and interagency partners (including Biomedical Advanced Research and Development Authority (BARDA), Defense Innovation Unit (DIU)) to develop prototype vaccine candidates utilizing matured platforms from established commercial manufacturing that target biothreats while utilizing a modular approach to ensure flexibility. These prototype vaccines (including, but not limited to, Messenger Ribonucleic Acid (mRNA) vaccines) will use a tailored acquisition pathway and will create a strategic reserve to counter the biothreats against the Warfighter and shorten the development time when an emergency occurs. Data generated from these efforts may be used to support an interim fielding capability (U.S. Food & Drug Administration (FDA) pre-Emergency Use Authorizations (EUA)/EUA and Expanded Access protocols) that could achieve FDA licensure as appropriate. These efforts will leverage the Other Transactions Authority (OTA) through the Medical CBRN Defense consortium, Broad Agency Announcements, and Commercial Solutions Opening. Data on VAMP products will be captured within Rapid Acquisition of Products in Development (RAPID) defense system to aid in identification of MCMs to counter threats.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Chemical and Biological Defense Program **Date:** March 2023

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603884BP / Chemical and Biological Defense Program - Dem/Val	Project (Number/Name) PT4 / Protect (ACD&P)
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Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
AA-ENBD - Development	Various	Various : N/A	-	0.000		53.690	Dec 2022	62.544	Dec 2023	-		62.544	Continuing	Continuing	0.000
GUIDE-ENBD - Development	Various	Various : N/A	-	0.000		50.050	Dec 2022	45.713	Dec 2023	-		45.713	Continuing	Continuing	0.000
MCMPT - HW S - Rapid Response	C/CPFF	TBD : N/A	-	0.000		4.282	Dec 2022	4.782	Dec 2023	-		4.782	Continuing	Continuing	0.000
MCMPT - HW S - P3/ Nucleic Acid	C/CPFF	TBD : N/A,	-	0.000		5.247	Dec 2022	3.930	Dec 2023	-		3.930	Continuing	Continuing	0.000
MCMPT - HW S - Manufacturing	C/CPFF	TBD : N/A	-	0.000		0.000		0.993		-		0.993	Continuing	Continuing	0.000
PLG MAB - HW S - Manufacturing, Non-Clinical and Clinical Development	Various	Various : N/A	-	0.000		11.970	Mar 2023	13.546	Dec 2023	-		13.546	Continuing	Continuing	0.000
UIPE FoS Footwear - HW S - Footwear Prototype	C/FFP	TBD : N/A	-	0.000		0.000		0.100	Jan 2024	-		0.100	Continuing	Continuing	0.000
VAMP-ENBD - Vaccine - Development	Various	Various : N/A	-	0.000		29.925	Dec 2022	28.254	Dec 2023	-		28.254	Continuing	Continuing	0.000
VAMP-ENBD - SBIR/STTR - Direct Program Support	Various	Various : N/A	-	0.000		0.000		2.745	Dec 2023	-		2.745	Continuing	Continuing	0.000
Subtotal			-	0.000		155.164		162.607		-		162.607	Continuing	Continuing	N/A

Support (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
BIOPROTO - TD/D S	MIPR	Army Contracting Command : Picatinny, NJ	-	0.000		2.573	Oct 2022	0.000		-		0.000	0.000	2.573	0.000
UIPE FoS Footwear - ES S - Logistics/Engineering Support	Various	Various : N/A	-	0.000		0.000		0.358	Jan 2024	-		0.358	Continuing	Continuing	0.000
Subtotal			-	0.000		2.573		0.358		-		0.358	Continuing	Continuing	N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Chemical and Biological Defense Program **Date:** March 2023

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603884BP / Chemical and Biological Defense Program - Dem/Val	Project (Number/Name) PT4 / Protect (ACD&P)
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Test and Evaluation (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
UIPE FoS Footwear - OTHT S - Swatch Testing (new/worn)	TBD	TBD : N/A	-	0.000		0.000		0.500	Apr 2024	-		0.500	Continuing	Continuing	0.000
UIPE FoS Footwear - OTHT S - Early User Testing	TBD	TBD : N/A	-	0.000		0.000		1.000	Jun 2024	-		1.000	Continuing	Continuing	0.000
UIPE FoS Footwear - OTHT S - Infrastructure	MIPR	TBD : N/A	-	0.000		0.000		0.282	Jan 2024	-		0.282	Continuing	Continuing	0.000
Subtotal			-	0.000		0.000		1.782		-		1.782	Continuing	Continuing	N/A

Management Services (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
AA-ENBD - Program Management	Various	Various : N/A	-	0.000		5.310	Dec 2022	5.120	Dec 2023	-		5.120	Continuing	Continuing	0.000
GUIDE-ENBD - Program Management	Various	Various : N/A	-	0.000		4.950	Dec 2022	3.920	Dec 2023	-		3.920	Continuing	Continuing	0.000
MCMPT - PM Support	Various	JPL CBRND Enabling Biotechnologies, JPEO-CBRND : Fort Detrick, MD	-	0.000		1.039	Dec 2022	0.771	Dec 2023	-		0.771	Continuing	Continuing	0.000
PLG MAB - PM/MS S - Program Management	Various	Various : N/A	-	0.000		1.108	Dec 2022	1.154	Dec 2023	-		1.154	Continuing	Continuing	0.000
UIPE FoS Footwear - PM/MS S - Management Services	Various	Various : N/A	-	0.000		0.000		0.146	Jan 2024	-		0.146	Continuing	Continuing	0.000
VAMP-ENBD - PM/MS S - Management Support	Various	Various : N/A	-	0.000		5.075	Dec 2022	3.300	Dec 2023	-		3.300	Continuing	Continuing	0.000
Subtotal			-	0.000		17.482		14.411		-		14.411	Continuing	Continuing	N/A

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Exhibit R-4, RDT&E Schedule Profile: PB 2024 Chemical and Biological Defense Program **Date:** March 2023

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603884BP / <i>Chemical and Biological Defense Program - Dem/Val</i>	Project (Number/Name) PT4 / <i>Protect (ACD&P)</i>
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FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027				FY 2028			
1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4

AA-ENBD - Discovery, identification and small scale manufacture of mAbs	
BIOPROTO - CDD Validation-Capability Development Document Validation	
GUIDE-ENBD - Integrated computational approach development	
MCMPT - Rapid Response Design, Manufacturing, Testing	
MCMPT - MCM Optimization Phase Design, Manufacturing, Testing	
MCMPT - Plague Nonclinical Studies	
MCMPT - Plague Clinical Studies	
MCMPT - Plague Manufacturing	
MCMPT - P3/Nucleic Acid	
PLG MAB - Non-clinical Studies-Non-clinical Studies	
PLG MAB - Manufacturing Development	
PLG MAB - Phase 1-Phase 1 Clinical Trials	
PLG MAB - MS B-Milestone B	
UIPE FoS Footwear - Prototype Development	
UIPE FoS Footwear - MS B-Milestone B	
UIPE FoS Footwear - DT&E-Developmental Test and Evaluation	
UIPE FoS Footwear - Operational Assessment	
UIPE FoS Footwear - CDR-Critical Design Review	

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Exhibit R-4, RDT&E Schedule Profile: PB 2024 Chemical and Biological Defense Program **Date:** March 2023

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603884BP / <i>Chemical and Biological Defense Program - Dem/Val</i>	Project (Number/Name) PT4 / <i>Protect (ACD&P)</i>
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	FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027				FY 2028							
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4				
UIPE FoS Footwear - OT&E-Operational Test and Evaluation																																
UIPE FoS Footwear - MS C-Milestone C																																
VAMP-ENBD - Vaccine Development																																

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Chemical and Biological Defense Program **Date:** March 2023

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603884BP / <i>Chemical and Biological Defense Program - Dem/Val</i>	Project (Number/Name) PT4 / <i>Protect (ACD&P)</i>
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Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
AA-ENBD - Discovery, identification and small scale manufacture of mAbs	1	2023	4	2028
BIOPROTO - CDD Validation-Capability Development Document Validation	1	2023	4	2023
GUIDE-ENBD - Integrated computational approach development	1	2024	4	2028
MCMPT - Rapid Response Design, Manufacturing, Testing	1	2022	4	2028
MCMPT - MCM Optimization Phase Design, Manufacturing, Testing	1	2022	4	2023
MCMPT - Plague Nonclinical Studies	1	2023	2	2024
MCMPT - Plague Clinical Studies	1	2024	2	2024
MCMPT - Plague Manufacturing	1	2022	1	2026
MCMPT - P3/Nucleic Acid	1	2024	4	2026
PLG MAB - Non-clinical Studies-Non-clinical Studies	1	2024	4	2024
PLG MAB - Manufacturing Development	2	2023	4	2026
PLG MAB - Phase 1-Phase 1 Clinical Trials	1	2025	4	2025
PLG MAB - MS B-Milestone B	1	2025	1	2025
UIPE FoS Footwear - Prototype Development	2	2024	3	2024
UIPE FoS Footwear - MS B-Milestone B	2	2025	2	2025
UIPE FoS Footwear - DT&E-Developmental Test and Evaluation	2	2025	1	2027
UIPE FoS Footwear - Operational Assessment	4	2025	4	2025
UIPE FoS Footwear - CDR-Critical Design Review	2	2026	2	2026
UIPE FoS Footwear - OT&E-Operational Test and Evaluation	3	2026	4	2026
UIPE FoS Footwear - MS C-Milestone C	2	2027	2	2027
VAMP-ENBD - Vaccine Development	1	2023	1	2028

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Chemical and Biological Defense Program **Date:** March 2023

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603884BP / <i>Chemical and Biological Defense Program - Dem/Val</i>	Project (Number/Name) MT4 / <i>Mitigate (ACD&P)</i>
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COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
MT4: <i>Mitigate (ACD&P)</i>	-	0.000	17.302	28.785	0.000	28.785	20.885	15.433	13.369	0.000	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Mitigate Advanced Component Development and Prototypes (ACD&P) Project provides the Joint Force the ability to conduct decontamination and medical actions that enable the quick restoration of combat power; maintain/recover essential functions that are free from the effects of Chemical Biological Radiological and Nuclear (CBRN) hazards; and facilitate the return to pre-incident operational capability as soon as possible. In FY 2023, the Chemical Biological Defense Program (CBDP) RDT&E Projects were restructured to align with the CBDP portfolio construct. MT4 efforts in FY 2022 remain in Projects DE4 and TM4. This restructuring provided standardization and alignment across CBDP research, development and acquisition efforts.

Efforts included in this Project are:

- (1) Automated Decon System (ADS)
- (2) Antiviral Oral Therapeutic (AVO TX)
- (3) Biological Warfare Defense Prototype (BIOPROTO)
- (4) Botulinum Toxin Therapeutic (BOT TX)
- (5) Consolidated Nerve Agent Treatment System (CNATS)
- (6) Discovery of Medical Countermeasures Against New and Emerging Threats (DOMANE)
- (7) Reactivating Nerve Agent Treatment System (RNATS)
- (8) Service Equipment Decontamination System (SEDS)
- (9) Tactical Contamination Mitigation System (TCMS)

The Automated Decontamination System (ADS) is a new start program in FY24. ADS is a semi-autonomous supported capability that relies on precision detection capabilities, modernized decontaminants, and robotics to allow a chemical, biological, radiological and nuclear (CBRN) decontamination squad to provide platoon level thorough decontamination on critical mission equipment and infrastructure. In FY24 ADS will award a concept prototype contract, accept delivery of an initial concept prototype and conduct an Alternative Systems Review.

The Antiviral Oral Therapeutics (AVO TX) is a new start program in FY24. AVO TX will provide the Joint Force the ability to recover from exposure to biological hazards and quickly return to the fight. Efforts include development of Food and Drug Administration (FDA) approved Medical Countermeasure (MCM) to protect the lives and maintain the battle readiness of the Warfighter. AVO TX fulfills an existing gap for a MCM to treat exposure to alpha virus.

The Biological Warfare Defense Prototype (BIOPROTO) supports early-phase clinical development and supporting non-clinical safety, tolerability and toxicity data for candidate vaccines and therapeutic drugs prior to transition to System Development & Demonstration. This work provides safe and effective medical defense against

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Chemical and Biological Defense Program	Date: March 2023
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validated biological threat agents and emerging infectious disease biothreats including bacteria, toxins, and viruses. This work also involves the evaluation of Food and Drug Administration (FDA) approved therapeutics for operational use, as well as generation of novel drug products and formulations, to enhance level of protection and/or operational utility for the Warfighter. This effort reduces programmatic risk of failure in the advanced development phase.

The Botulinum Toxin Therapeutic (BOT TX) is a new start program in FY24. BOT TX will develop and deliver a Food and Drug Administration (FDA) approved treatment for the warfighter to treat respiratory depression caused by botulinum toxin exposure. Botulinum toxin exposure is lethal and there are no available therapeutics that can be administered for BOT treatment in the field environment. This intramuscular injectable treatment is already approved for human use by the FDA.

The Consolidated Nerve Agent Treatment System (CNATS) is a new start program in FY24. CNATS will deliver an FDA-approved autoinjector that combines anticholinergics, atropine and scopolamine, and a new broad-spectrum oxime. The proposed oxime will have efficacy against emerging threats including Fourth Generation Agents (FGAs). Combining nerve agent treatments into fewer autoinjectors will reduce basic load for service members.

The Discovery of Medical Countermeasures Against Novel Entities (DOMANE) supports prototype development of emerging technology platforms and technologies to identify medical countermeasures (MCMs), MCM targets, and disease pathogenesis and toxicity using the combination of Artificial Intelligence/Machine Learning, organs-on-a-chip, high-throughput screening as well as novel imaging platforms. Additionally, MT4 supports early-phase clinical development of prophylaxis treatments and therapeutic drugs through the use of adaptive clinical trials to provide safe and effective medical defense against validated biological threat agents and emerging infectious disease biothreats including bacteria, toxins, and viruses. This effort reduces programmatic risk of failure in the advanced development phase by developing validated prototypes and generating clinical and supporting non-clinical safety, tolerability and toxicity data for candidate prophylaxis treatments and therapeutic drugs prior to transition to System Development & Demonstration.

The Reactivator Nerve Agent Treatment System (RNATS) is a new start program in FY24. RNATS will provide the Services an FDA-approved broad-spectrum oxime to address emerging chemical threats and fourth generation agents (FGAs). The program will field a vial formulation as an additional capability to mitigate gaps in current nerve agent therapeutics.

The Service Equipment Decontamination System (SEDS) program consists of two efforts, Joint SEDS and Special Operations Forces (SOF) Critical Equipment Decontamination (CEDS), which will develop a capability for use by the Warfighter during the decontamination operations that will provide a quantifiable reduction in the number of personnel experiencing adverse health effects by reducing contamination on equipment, individual combat equipment, and sensitive platform interiors. This capability is needed to sustain both the Joint and SOF by reducing logistical burdens in order to increase tactical agility and sustain a resilient force posture, and align with the National Defense Strategy (NDS). SEDS and CEDS will provide contamination mitigation capabilities for critical equipment that have been exposed to chemical and biological contamination and achieve efficacy levels that allow unprotected post-decontamination exposures for long periods with less than negligible severity effects. In FY24, the Joint SEDS effort will continue through the Engineering and Manufacturing Development (EMD) phase with Developmental Testing (DT) and a Critical Design Review (CDR). FY23 is last year of BA4 funding, program is transitioning to EMD.

The Tactical Containment Mitigation System (TCMS) is a Contamination Mitigation concept and intends to address gaps related to the decontamination of critical equipment and vehicles and it will reduce the time and logistics associated with decontamination. TCMS will limit the spread and mitigate the effects of Chemical,

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Biological, and Radiological (CBR) contamination to allow warfighters to continue their mission for an extended period of time in a high threat, CBR contaminated environment. The Program's intent is to mitigate the risk to personnel and limit the potential spread of CBR contamination by minimizing contact and transfer hazards. TCMS will greatly enhance or eliminate the need for subsequent decontamination to mitigate contamination on military equipment. Following application of TCMS, combined with weathering, Mission Oriented Protective Posture (MOPP) levels may be reduced without further decontamination, depending on the surface or material being decontaminated and the agent. In FY24 the program will continue prototype testing and complete technical reviews in support of the Milestone B/Engineering Manufacturing & Development (EMD) Phase. FY24 is last year of BA4 funding, program is transitioning to the Engineering Manufacturing & Development (EMD) Phase.

B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2022	FY 2023	FY 2024
<p>Title: 1) ADS - Prototype Development</p> <p>Description: Development of Robotic Platform Systems</p> <p>FY 2024 Plans: Begin prototype development, conduct alternative systems review</p> <p>FY 2023 to FY 2024 Increase/Decrease Statement: Program/project is new start effort in FY 2024.</p>	-	-	1.500
<p>Title: 2) AVO TX - Non Clinical Study</p> <p>Description: Non Clinical Studies</p> <p>FY 2024 Plans: Initiate Natural History Study (NHS).</p> <p>FY 2023 to FY 2024 Increase/Decrease Statement: Program/project is new start effort in FY 2024.</p>	-	-	3.740
<p>Title: 3) BIOPROTO</p> <p>Description: Funds biomedical research focused on the nonclinical and early clinical development of therapeutic countermeasures against known and emerging viral, bacterial, and toxin biological warfare (BW) threats for which U.S. Food and Drug Administration (FDA)-approved therapeutics are limited or lacking. BW defense therapeutics mitigate and reverse the effects of known and emerging viral, bacterial, and toxin biological warfare threats in symptomatic warfighters diagnosed with BW disease. They are the last line of defense against BW threats and are critical to returning symptomatic warfighters to service. Biomedical research is focused on nonclinical development (e.g., animal model, and formulation/manufacturing studies) and early clinical evaluation of broad-spectrum therapeutic candidates that target viruses, bacteria or toxins directly, enhance the host response (e.g., by modulating the immune system) and/or relieve BW disease symptoms. Therapeutic candidates that are shown to be both safe and efficacious against BW threats will advance for further non-clinical and/or clinical evaluation under RDT&E budget activity 5, and can be accelerated for use against emerging infectious diseases</p>	-	2.572	-

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B. Accomplishments/Planned Programs (\$ in Millions)		FY 2022	FY 2023	FY 2024
<p>during an outbreak. Clinical and nonclinical evaluation of novel small molecules (chemically synthesized), novel biologic molecules (isolated from natural sources), drug and drug/vaccine combinations (aka layered defense), and repurposing of drugs approved by the FDA or in clinical development for other indications, are included in this research. Refinement of appropriate animal models in which to evaluate therapeutic candidates is also included. Projects leverage interagency and commercial sector investments to accelerate development and reduce costs.</p> <p>FY 2023 Plans: - Continue nonclinical and regulatory activities to transition broad spectrum antibacterial candidate to BARDA. - Initiate clinical and/or nonclinical studies for broad-spectrum antibacterial/antiviral or toxin therapeutic candidate.</p> <p>FY 2023 to FY 2024 Increase/Decrease Statement: Program/project funding transferred to another funding line. FY 2024 funding has been transferred to Project PT3 for better alignment under budget activity 3.</p>				
<p>Title: 4) BOT TX Description: Nonclinical Studies</p> <p>FY 2024 Plans: Initiate non-clinical study for Dose Determination following FDA animal rule guidance.</p> <p>FY 2023 to FY 2024 Increase/Decrease Statement: Program/project is new start effort in FY 2024.</p>		-	-	2.847
<p>Title: 5) BOT TX Description: Manufacturing</p> <p>FY 2024 Plans: Initiate scale-up manufacturing for intermuscular injection product.</p> <p>FY 2023 to FY 2024 Increase/Decrease Statement: Program/project is new start effort in FY 2024.</p>		-	-	5.000
<p>Title: 6) CNATS - Acquisition Activities Description: Acquisition Activities</p> <p>FY 2024 Plans: Initiate activities to support the Milestone Development Decision (MDD) and Milestone B.</p>		-	-	2.388

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B. Accomplishments/Planned Programs (\$ in Millions)		FY 2022	FY 2023	FY 2024
<p>1. Perform Market Research and develop AoA study guidance and plan as required.</p> <p>2. Perform Affordability Analysis to support the development of Program goals.</p> <p>3. Perform Technology Readiness Assessment for potential candidate materiel solutions.</p> <p>FY 2023 to FY 2024 Increase/Decrease Statement: Program/project is new start effort in FY 2024.</p>				
<p>Title: 7) CNATS - Pre Milestone B</p> <p>Description: Technical Studies and Feasibility</p> <p>FY 2024 Plans: Assess feasibility of drug combination.</p> <p>FY 2023 to FY 2024 Increase/Decrease Statement: Program/project is new start effort in FY 2024.</p>		-	-	1.500
<p>Title: 8) DOMANE</p> <p>Description: Prototype Development and Early-Phase Clinical Development</p> <p>FY 2023 Plans:</p> <ul style="list-style-type: none"> - Supports the advanced development of medical countermeasures to include prophylaxes, pretreatments, antidotes and therapeutic drugs against identified and emerging biological warfare threat agents. - Demonstration of human safety and tolerability prior to entry of candidate prophylaxes and therapeutics into advanced development using adaptive clinical trials. - Continued development of prototypes for high-resolution forecasting of pathogenesis or toxicity that occurs during host interaction of a biological threat with its host. - Continued development of adaptive clinical trial platforms for drug re-purposing efforts. - Development of prototypes for precision predictions of medical countermeasures that interfere with key pathogenesis or toxicity events and restore homeostasis coupled with artificial intelligence/machine learning (AI/ML). - Initiate development of prototype for accurate prediction of targets on the biological threat and within the host that result in the necessary engagements to produces pathogenesis or toxicity using AI/ML. <p>FY 2023 to FY 2024 Increase/Decrease Statement: Program/project terminated in FY 2024. The impact will be a slow-down in the development of platform prototypes for high throughput screening as well as AI development for predicting MCMs for new and emerging pathogens.</p>		-	1.038	-
<p>Title: 9) RNATS</p>		-	-	5.270

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B. Accomplishments/Planned Programs (\$ in Millions)		FY 2022	FY 2023	FY 2024
<p>Description: Reactivating Nerve Agent Treatment System (RNATS)</p> <p>FY 2024 Plans: Initiate development of broad spectrum oxime for FDA approval. Initiate Natural History Studies for alternative large animal model development. Initiate API procurement and compounding development.</p> <p>FY 2023 to FY 2024 Increase/Decrease Statement: Program/project is new start effort in FY 2024.</p>				
<p>Title: 10) SEDS</p> <p>Description: Milestone (MS) B support and Prototype Development</p> <p>FY 2023 Plans: Integrate system components into full prototype system(s). Complete Special Operations Forces (SOF) Developmental Testing (DT) and Joint Service Early Developmental Testing (EDT). Conduct Preliminary Design Review (PDR) for Other Services, and Technology Readiness Assessment (TRA). Update MS documentation and conduct MS B Decision Reviews.</p> <p>FY 2023 to FY 2024 Increase/Decrease Statement: Program/project transitioned to Engineering and Manufacturing Development Phase.</p>		-	9.515	-
<p>Title: 11) TCMS</p> <p>Description: Milestone (MS) A support and Prototype Development</p> <p>FY 2023 Plans: Complete Milestone A and award a prototyping Other Transaction Authority (OTA) contract. Conduct a Systems Readiness Review (SRR) and Test Readiness Review (TRR) of the prototypes to be tested. Begin prototype testing and update prototypes. Conduct a Business Case Analysis (BCA) for the program sustainment strategy.</p> <p>FY 2024 Plans: Continue iterative prototype testing and complete technical reviews and documentation in support of the Milestone (MS) B/ Engineering Manufacturing & Development (EMD) Phase.</p> <p>FY 2023 to FY 2024 Increase/Decrease Statement: Increase due to change in program/project technical parameters. Increase of funding to complete TMRR phase.</p>		-	4.177	6.540
Accomplishments/Planned Programs Subtotals		-	17.302	28.785

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C. Other Program Funding Summary (\$ in Millions)

Line Item	FY 2022	FY 2023	FY 2024	FY 2024	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028	Cost To	
			Base	OCO	Total					Complete	Total Cost
• DE4: <i>Decontamination (ACD&P)</i>	14.747	-	-	-	-	-	-	-	-	0.000	14.747
• MT3: <i>Mitigate (ATD)</i>	-	86.157	100.791	-	100.791	89.511	91.704	85.795	85.480	Continuing	Continuing
• MT5: <i>Mitigate (SDD)</i>	-	74.225	88.441	-	88.441	92.279	91.431	87.773	93.250	Continuing	Continuing
• PT4: <i>Protect (ACD&P)</i>	-	175.219	179.158	-	179.158	135.096	107.341	123.538	139.376	Continuing	Continuing
• TM4: <i>Techbase Medical Defense (ACD&P)</i>	29.687	-	-	-	-	-	-	-	-	0.000	29.687
• PHM007: <i>Service Equipment Decontamination System (SEDS)</i>	-	-	-	-	-	14.028	22.531	24.920	13.050	Continuing	Continuing
• PHM042: <i>Tactical Contamination Mitigation System (TCMS)</i>	-	-	-	-	-	-	1.250	5.072	5.000	Continuing	Continuing
• PHM045: <i>Botulinum Therapeutic (BOT TX)</i>	-	-	-	-	-	-	-	-	54.485	Continuing	Continuing

Remarks

D. Acquisition Strategy

Automated Decontamination System

The Automated Decontamination System (ADS) acquisition approach will focus on the integration of hardware and software components to deliver a capability that performs decontamination procedures autonomously. It will use developmental, government off the shelf (GOTS), and commercial off the shelf (COTS) products using a system of systems approach and prototyping. The program will conduct developmental, operational, and integration testing to understand how an autonomous decontamination system will be employed, operated, and supported considering the current military operational framework.

Antiviral Oral Therapeutic

The Antiviral Oral Therapeutic Program (AVO TX) program acquisition strategy supports the development through the Engineering, Manufacturing and Development (EMD) phase for a Federal and Drug Administration (FDA) approved oral broad spectrum antiviral therapeutic for the Warfighter. Initial drug product will be developed targeting Encephalitic Virus Disease (VEEV), with potential for other indications as a broad spectrum oral antiviral. The operational concept is to provide an oral broad-spectrum therapeutic Medical Countermeasures (MCM) to the Joint Force following a "trigger event" relating to a virus exposure (e.g., a credible intelligence report of use or potential use, a positive outcome of an environmental sample analysis, or a clinical specimen diagnostic test). This is a transition from Science and Technology (S&T). This program will leverage safety and large scale manufacturing from COVID.

Botulinum Toxin Therapeutic

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The Botulinum Toxin Therapeutic (BOT TX) program will transition from the Joint Science and Technology Office for Chemical and Biological Defense (JSTO-CBD) to JPEO CBRND. In the BOT TX acquisition strategy, the continued advanced activities will be performed through the Medical CBRN Defense Consortium (MCDC)/Other Transaction Agreement (OTA) supporting the development through the Engineering, Manufacturing and Development (EMD) phase for a Food and Drug Administration (FDA) approved treatment for the Warfighter to against respiratory depression caused by botulinum toxin exposure. BOT TX is part of the layered defense against BONT covering both treatment (BOT TX) and pre-exposure prophylaxis (BOT MAB). The product will produce an intermuscular injection capability that is based on an oral drug that is already approved for human use by the FDA.

Consolidated Nerve Agent Treatment System

In the CNATS acquisition strategy, a contractor will sponsor and conduct activities to achieve Food and Drug Administration (FDA) approval. The government will leverage data obtained under a Small Business and Innovation Research (SBIR) project. The government contemplates utilizing an Other Transaction Authority (OTA) agreement. Upon FDA approval, a follow-on procurement contract will acquire quantities of product to meet Full Operational Capability (FOC). Sustainment will be the responsibility of the Defense Logistics Agency Troop Support. Post marketing commitments and requirements are anticipated as a result of the FDA approval and will be the responsibility of the contractor and the government.

Reactivating Nerve Agent Treatment System

The Reactivator Nerve Agent Treatment System (RNATS) acquisition strategy will leverage prior investments in prior oxime developments by Canada and the United Kingdom. A contractor shall be responsible for conducting activities associated with drug development to obtain U.S. Food and Drug Administration (FDA) approval via a government Other Transaction Authority (OTA) agreement. The contractor shall sponsor the drug. Upon FDA approval, a follow-on procurement contract will acquire quantities of product to meet Full Operational Capability (FOC). Subsequent purchases for product sustainment will be made by the Defense Logistics Agency Troop Support. Post marketing commitments and requirements are anticipated as a result of the FDA approval and will be the responsibility of the contractor and the government.

SERVICE EQUIPMENT DECONTAMINATION SYSTEM (SEDS)

The Joint Service Equipment Decontamination System (SEDS) and Special Operations Forces (SOF) Critical Equipment Decontamination System (CEDS) program will utilize the Countering Weapons of Mass Destruction Other Transaction Authority (CWMD OTA) to design and develop state of the art equipment using competitive and iterative prototyping. The program will test prototypes against live chemical warfare agents and biological warfare agents, conduct reliability, availability, and maintainability testing, conduct regular user evaluations to identify human system integration issues, and will conduct testing to ensure the system meets military standards. The program will use the Request for Prototype Proposals (RPP), under the CWMD OTA, followed by awards of Prototype Agreement. In FY24, the Program will conduct MS B activities for Special Operation Forces (SOF) and Other Services, conclude Engineering, Manufacturing and Development (EMD) testing, conduct operational testing and limited user evaluations, and conduct a Critical Design Review (CDR) for SOF.

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TACTICAL CONTAMINATION MITIGATION SYSTEM (TCMS)

The Tactical Containment Mitigation System (TCMS) program will develop the equipment, processes and procedures for contamination mitigation related to post-incident operations in a Chemical Biological Radiological and Nuclear (CBRN) contaminated environment. The acquisition strategy includes market research through both Requests for Information (RFIs) and a call for White Papers through an Other Transaction Authority (OTA) contracting approach. Data collected will inform a Milestone A decision in FY23. The OTA vehicle will also be used to request prototypes, which will undergo technology demonstrations and Early Field testing, followed by an analysis to determine the most suitable candidate. Results of Prototyping will inform Milestone B and Request for Proposals (RFPs) followed by developmental and operational testing and Milestone C/Full Rate Production Approval.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Chemical and Biological Defense Program **Date:** March 2023

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Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
ADS - HW C - Prototype Modification	TBD	TBD : N/A	-	0.000		0.000		0.356	Jan 2024	-		0.356	Continuing	Continuing	0.000
BIOPROTO - Clinical/Non-clinical studies for Broad Spectrum antibacterial/antiviral candidates	MIPR	U.S. Army Contracting Command (ACC-NJ) : Picatinny, NJ	-	0.000		2.572	Oct 2022	0.000		-		0.000	0.000	2.572	0.000
BOT TX - Nonclinical/Manufacturing	Various	Various : N/A	-	0.000		0.000		6.590	Dec 2023	-		6.590	Continuing	Continuing	0.000
CNATS - Acq Activities/Pre M/S B	Various	Various : N/A	-	0.000		0.000		2.925	Mar 2024	-		2.925	Continuing	Continuing	0.000
CNATS - Product Management	Various	JPM CBRN Medical, JPEO-CBRND : Fort Detrick, MD	-	0.000		0.000		0.535	Nov 2023	-		0.535	Continuing	Continuing	0.000
DOMANE	MIPR	U.S. Army Contracting Command (ACC-NJ) : Picatinny, NJ	-	0.000		1.038	Oct 2022	0.000		-		0.000	0.000	1.038	0.000
RNATS - HW C - Development	Various	JPM CBRN Medical, JPEO-CBRND : Fort Detrick, MD	-	0.000		0.000		4.208	Jun 2024	-		4.208	Continuing	Continuing	0.000
RNATS - Product Development	Various	JPM CBRN Medical, JPEO-CBRND : Fort Detrick, MD	-	0.000		0.000		0.482	Jan 2024	-		0.482	Continuing	Continuing	0.000
SEDS - HW S - Product Development	SS/FFP	TBD : N/A	-	0.000		4.366	Nov 2022	0.000		-		0.000	0.000	4.366	0.000
TCMS - HW S - Product Development	C/FFP	TBD : N/A	-	0.000		1.256	Nov 2022	1.800	Jan 2024	-		1.800	Continuing	Continuing	0.000
Subtotal			-	0.000		9.232		16.896		-		16.896	Continuing	Continuing	N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Chemical and Biological Defense Program **Date:** March 2023

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Support (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
ADS - Engineering Support	MIPR	TBD : N/A	-	0.000		0.000		0.225	Nov 2023	-		0.225	Continuing	Continuing	0.000
SEDS - ILS S - Logistics, Engineering and IPT Support	MIPR	Various : N/A	-	0.000		2.098	Nov 2022	0.000		-		0.000	0.000	2.098	0.000
TCMS - ES S - Logistics, Engineering and IPT Support	MIPR	Various : N/A	-	0.000		0.684	Nov 2022	0.981	Nov 2023	-		0.981	Continuing	Continuing	0.000
Subtotal			-	0.000		2.782		1.206		-		1.206	Continuing	Continuing	N/A

Test and Evaluation (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
ADS - DTE C - Prototype System Testing	MIPR	TBD : N/A	-	0.000		0.000		0.827	Nov 2023	-		0.827	Continuing	Continuing	0.000
AVO TX - Non Clinical Studies	Various	Various : N/A	-	0.000		0.000		2.940	Dec 2023	-		2.940	Continuing	Continuing	0.000
SEDS - OTHT S - T&E IPR Test Planning	MIPR	Various : N/A	-	0.000		2.280	Nov 2022	0.000		-		0.000	0.000	2.280	0.000
TCMS - OTHT S - Prototype T&E IPR Test Planning	MIPR	Various : N/A	-	0.000		1.732	Jan 2023	3.358	Nov 2023	-		3.358	Continuing	Continuing	0.000
Subtotal			-	0.000		4.012		7.125		-		7.125	Continuing	Continuing	N/A

Management Services (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
ADS - PM/MS C - Program Management	MIPR	TBD : N/A	-	0.000		0.000		0.092	Nov 2023	-		0.092	Continuing	Continuing	0.000
AVO TX - Management Support	Various	Various : N/A	-	0.000		0.000		0.800	Dec 2023	-		0.800	Continuing	Continuing	0.000

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Exhibit R-4, RDT&E Schedule Profile: PB 2024 Chemical and Biological Defense Program		Date: March 2023
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	FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027				FY 2028			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
ADS - Initial Concept Prototype	[Redacted]																											
ADS - MDD-Materiel Development Decision	[Redacted]																											
ADS - DT&E-Developmental Test and Evaluation - Prototyping Demonstration	[Redacted]																											
ADS - MS A-Milestone A	[Redacted]																											
ADS - MS B-Milestone B	[Redacted]																											
ADS - MS C-Milestone C	[Redacted]																											
AVO TX - Non-clinical Studies-Non-clinical Studies - Natural History, efficacy, dose ranging and pivotal studies	[Redacted]																											
BIOPROTO - CDD Validation-Capability Development Document Validation	[Redacted]																											
BOT TX - Non-clinical Studies-Non-clinical Studies	[Redacted]																											
BOT TX - Manufacturing Scale-up	[Redacted]																											
CNATS - Pre Milestone B	[Redacted]																											
CNATS - Acquisition activities	[Redacted]																											
CNATS - MDD-Materiel Development Decision	[Redacted]																											
CNATS - MS B-Milestone B	[Redacted]																											
CNATS - MS C-Milestone C	[Redacted]																											
CNATS - FDA Approval-Food and Drug Administration Approval	[Redacted]																											
RNATS - DT&E-Developmental Test and Evaluation - Initiate natural history studies	[Redacted]																											
RNATS - MS B-Milestone B	[Redacted]																											

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Exhibit R-4, RDT&E Schedule Profile: PB 2024 Chemical and Biological Defense Program **Date:** March 2023

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603884BP / <i>Chemical and Biological Defense Program - Dem/Val</i>	Project (Number/Name) MT4 / <i>Mitigate (ACD&P)</i>
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	FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027				FY 2028			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
SEDS - Prototype Agreement Award (SOF and Other Services)				■																								
SEDS - CDD Validation-Capability Development Document Validation - Other Services							■																					
SEDS - Early Developmental Testing (Other Services)							■																					
SEDS - MS B-Milestone B - Other Services												■																
SEDS - DT&E-Developmental Test and Evaluation - Other Services																												
SEDS - MS C-Milestone C - Other Services																												
SEDS - FRP-Full Rate Production Decision - Other Services																												
SEDS - DT&E-Developmental Test and Evaluation - SOF																												
SEDS - RFP-Development Request for Proposal Release Decision - SOF and Other Services																												
SEDS - MS B-Milestone B - SOF																												
SEDS - MS C-Milestone C - SOF																												
SEDS - IOC-Initial Operational Capability - SOF																												
SEDS - FOC-Full Operational Capability - SOF																												
TCMS - Market Research																												
TCMS - RFP-Development Request for Proposal Release Decision																												
TCMS - Prototype Contract Award																												
TCMS - Life Cycle Sustainment Plan (LCSP)																												

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Exhibit R-4, RDT&E Schedule Profile: PB 2024 Chemical and Biological Defense Program **Date:** March 2023

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603884BP / <i>Chemical and Biological Defense Program - Dem/Val</i>	Project (Number/Name) MT4 / <i>Mitigate (ACD&P)</i>
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	FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027				FY 2028			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
TCMS - System Readiness Review (SRR)																												
TCMS - Test and Evaluation Master Plan (TEMP)																												
TCMS - Test Readiness Review (TRR)																												
TCMS - Simplified Acquisition Management Plan (SAMP)																												
TCMS - MS A-Milestone A																												
TCMS - Prototype Testing																												
TCMS - Acquisition Program Baseline (APB)																												
TCMS - CDD Validation-Capability Development Document Validation																												
TCMS - MS B-Milestone B																												
TCMS - DT&E-Developmental Test and Evaluation - Developmental Test & Evaluation																												
TCMS - System Verification Review/Production Readiness Review																												
TCMS - MS C-Milestone C																												
TCMS - FRP-Full Rate Production Decision																												

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Chemical and Biological Defense Program **Date:** March 2023

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603884BP / <i>Chemical and Biological Defense Program - Dem/Val</i>	Project (Number/Name) MT4 / <i>Mitigate (ACD&P)</i>
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Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
ADS - Initial Concept Prototype	1	2024	3	2027
ADS - MDD-Materiel Development Decision	2	2024	2	2024
ADS - DT&E-Developmental Test and Evaluation - Prototyping Demonstration	3	2024	3	2026
ADS - MS A-Milestone A	4	2025	4	2025
ADS - MS B-Milestone B	3	2026	3	2026
ADS - MS C-Milestone C	4	2028	4	2028
AVO TX - Non-clinical Studies-Non-clinical Studies - Natural History, efficacy, dose ranging and pivotal studies	1	2025	2	2025
BIOPROTO - CDD Validation-Capability Development Document Validation	1	2023	4	2023
BOT TX - Non-clinical Studies-Non-clinical Studies	1	2025	4	2025
BOT TX - Manufacturing Scale-up	1	2025	4	2025
CNATS - Pre Milestone B	1	2024	4	2024
CNATS - Acquisition activities	1	2025	1	2026
CNATS - MDD-Materiel Development Decision	2	2025	2	2025
CNATS - MS B-Milestone B	1	2027	1	2027
CNATS - MS C-Milestone C	4	2028	4	2028
CNATS - FDA Approval-Food and Drug Administration Approval	4	2028	4	2028
RNATS - DT&E-Developmental Test and Evaluation - Initiate natural history studies	3	2024	3	2025
RNATS - MS B-Milestone B	3	2025	3	2025
SEDS - Prototype Agreement Award (SOF and Other Services)	4	2022	4	2022
SEDS - CDD Validation-Capability Development Document Validation - Other Services	1	2023	2	2023
SEDS - Early Developmental Testing (Other Services)	1	2023	3	2023

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Chemical and Biological Defense Program **Date:** March 2023

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603884BP / <i>Chemical and Biological Defense Program - Dem/Val</i>	Project (Number/Name) MT4 / <i>Mitigate (ACD&P)</i>
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Events	Start		End	
	Quarter	Year	Quarter	Year
SEDS - MS B-Milestone B - Other Services	4	2023	4	2023
SEDS - DT&E-Developmental Test and Evaluation - Other Services	1	2024	3	2025
SEDS - MS C-Milestone C - Other Services	3	2026	3	2026
SEDS - FRP-Full Rate Production Decision - Other Services	4	2027	4	2027
SEDS - DT&E-Developmental Test and Evaluation - SOF	3	2022	4	2023
SEDS - RFP-Development Request for Proposal Release Decision - SOF and Other Services	4	2022	4	2022
SEDS - MS B-Milestone B - SOF	3	2023	3	2023
SEDS - MS C-Milestone C - SOF	4	2024	4	2024
SEDS - IOC-Initial Operational Capability - SOF	2	2026	2	2026
SEDS - FOC-Full Operational Capability - SOF	4	2028	4	2028
TCMS - Market Research	1	2022	3	2022
TCMS - RFP-Development Request for Proposal Release Decision	3	2022	3	2022
TCMS - Prototype Contract Award	4	2022	4	2022
TCMS - Life Cycle Sustainment Plan (LCSP)	2	2023	2	2023
TCMS - System Readiness Review (SRR)	2	2023	2	2023
TCMS - Test and Evaluation Master Plan (TEMP)	2	2023	2	2023
TCMS - Test Readiness Review (TRR)	3	2023	3	2023
TCMS - Simplified Acquisition Management Plan (SAMP)	3	2023	3	2023
TCMS - MS A-Milestone A	3	2023	3	2023
TCMS - Prototype Testing	1	2024	2	2024
TCMS - Acquisition Program Baseline (APB)	3	2024	3	2024
TCMS - CDD Validation-Capability Development Document Validation	2	2025	2	2025
TCMS - MS B-Milestone B	2	2025	2	2025
TCMS - DT&E-Developmental Test and Evaluation - Developmental Test & Evaluation	3	2025	3	2026
TCMS - System Verification Review/Production Readiness Review	3	2026	3	2026

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Chemical and Biological Defense Program **Date:** March 2023

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603884BP / <i>Chemical and Biological Defense Program - Dem/Val</i>	Project (Number/Name) MT4 / <i>Mitigate (ACD&P)</i>
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Events	Start		End	
	Quarter	Year	Quarter	Year
TCMS - MS C-Milestone C	4	2026	4	2026
TCMS - FRP-Full Rate Production Decision	4	2027	4	2027

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Chemical and Biological Defense Program										Date: March 2023		
Appropriation/Budget Activity 0400 / 4					R-1 Program Element (Number/Name) PE 0603884BP / <i>Chemical and Biological Defense Program - Dem/Val</i>				Project (Number/Name) EN4 / <i>Enabling Investments (ACD&P)</i>			
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
EN4: <i>Enabling Investments (ACD&P)</i>	-	0.000	6.781	47.272	0.000	47.272	51.579	9.792	9.840	9.840	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Enabling Investments Advanced Component Development and Prototypes (ACD&P) Project maintains the Department of Defense (DoD) advanced development manufacturing facility to rapidly develop, manufacture, and approve medical countermeasures. Enabling efforts in this area support dedicated infrastructure capabilities, demonstrations, and overarching development support functions as portfolio enablers responding to emerging threats. Priority access to the facility provides an on demand manufacturing capability not only for the DoD but for the entire United States Government enterprise. In FY 2023, the Chemical Biological Defense Program (CBDP) RDT&E Projects were restructured to align with the CBDP portfolio construct. EN4 efforts in FY 2022 remain in Project MB4. This restructuring provided standardization and alignment across CBDP research, development and acquisition efforts.

Efforts included in this Project are:

- (1) Chem Bio Incident Preparedness and Response - Advanced Development and Manufacturing (CBIPR-ADM)
- (2) Medical Countermeasures Manufacturing Optimization (MCM MFRO)

The CBIPR-ADM ensures prioritization to domestic biopharmaceutical manufacturing capacities, capabilities, and infrastructure (e.g. the DoD-ADM Facility and other strategic partners) that are operationally ready to rapidly develop and manufacture medical countermeasures (MCMs) against current and emerging chemical and biological threats including pandemic response. Prioritization is achieved by establishing and enhancing proven biopharmaceutical manufacturing platform technologies and infrastructure at these facilities. Thus, these facilities will have the capability to accelerate development of MCMs at all stages of development, enhance preparedness for existing threats, and rapidly respond to emerging threats as part of a medical integrated layered defense. MCMs that benefit from these efforts include: Vaccines for Viral Agents, Vaccines for Bacterial Agents and Toxins, monoclonal antibodies, antibody fragments and conjugates for therapeutic and prophylactic use across all agent classes. Funds to support prioritization and operational readiness were previously provided via individual product development and manufacturing funding lines. The Department is now providing dedicated funds. The CBIPR-ADM return on investment is an increased level of preparedness and responsiveness. In FY24, the CBIPR-ADM program continues to establish and enhance new manufacturing platform technologies and infrastructure that will enable the development of MCMs against chemical and biological threats.

The MCM MFRO postures the DoD to rapidly respond to biological incidents by leveraging partners across Industrial Base, Chemical and Biological Defense Program, and Defense Health Program to reduce time required to onshore materials critical to the rapid production of medical countermeasures. Furthermore, MCM MFRO will increase the use of computational tools and manufacturing controls to optimize development of MCMs for accelerated delivery to the Warfighter. In FY24, MCM MFRO will increase usage of computational tools and manufacturing controls, initiate optimization of cell productivity, initiate development of starting materials and conduct a process efficiency study.

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Chemical and Biological Defense Program		Date: March 2023
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603884BP / <i>Chemical and Biological Defense Program - Dem/Val</i>	Project (Number/Name) EN4 / <i>Enabling Investments (ACD&P)</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2022	FY 2023	FY 2024
<p>Title: 1) CBIPR-ADM</p> <p>Description: Establish proven enabling manufacturing technologies at the Department of Defense (DoD) ADM Capability Building.</p> <p>FY 2023 Plans: Continue technology transfer and enhancement of manufacturing technologies to support manufacture medical countermeasures (MCM) development against biological threats. Manufacturing technologies can come from any government sources (including the Joint Science & Technology Office for Chemical Biological Defense (JSTO-CBD), the Walter Reed Army Institute of Research (WRAIR), the Biomedical Advanced Research and Development Authority (BARDA), etc. when mature enough for BA4 funding) and other external sources and targets of opportunity from industry.</p> <p>FY 2024 Plans: Continue activities to technology-transfer and establish new manufacturing technologies and infrastructure that support the development and manufacturing of medical countermeasures (MCMs) at the DoD-ADM Facility and strategic partners. This approach ensures that the DoD's efforts are not limited to a single facility. New manufacturing technologies can come from any government sources (including JSTO, WRAIR, BARDA, etc. when mature enough for BA4 funding) and/or other external sources and targets of opportunity from industry.</p> <p>FY 2023 to FY 2024 Increase/Decrease Statement: Minor change due to routine program adjustments.</p>	-	6.781	9.172
<p>Title: 2) MCM MFRO</p> <p>Description: Biologics Optimization</p> <p>FY 2024 Plans: Initiate optimization of computational tools and manufacturing tools to reduce the cost per dose and time to field for medical countermeasures through optimization of cell productivity and control, in order to improve product quality, consistency, and stability.</p> <p>FY 2023 to FY 2024 Increase/Decrease Statement: Additional investment to advance the overarching goals aligned with the 2022 National Biodefense Strategy and Implementation Plan (NBS).</p>	-	-	27.000
<p>Title: 3) MCM MFRO</p> <p>Description: Small Molecule Synthesis</p>	-	-	10.800

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Chemical and Biological Defense Program		Date: March 2023
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603884BP / <i>Chemical and Biological Defense Program - Dem/Val</i>	Project (Number/Name) EN4 / <i>Enabling Investments (ACD&P)</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2022	FY 2023	FY 2024
<p><i>FY 2024 Plans:</i> Initiate development of critical reagents (such as catalysts), repository stockpile of starting materials, and a database for rapid sourcing of starting materials and critical reagents from stockpile or from other sources during a manufacturing surge.</p> <p><i>FY 2023 to FY 2024 Increase/Decrease Statement:</i> Additional investment to advance the overarching goals aligned with the 2022 National Biodefense Strategy and Implementation Plan (NBS).</p>			
<p><i>Title:</i> 4) MCM MFRO</p> <p><i>Description:</i> Process Improvement/Quality</p> <p><i>FY 2024 Plans:</i> Initiate quality release process efficiency study to reduce delays in the manufacturing batch release process.</p> <p><i>FY 2023 to FY 2024 Increase/Decrease Statement:</i> Additional investment to advance the overarching goals aligned with the 2022 National Biodefense Strategy and Implementation Plan (NBS).</p>	-	-	0.300
Accomplishments/Planned Programs Subtotals	-	6.781	47.272

C. Other Program Funding Summary (\$ in Millions)											
<u>Line Item</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u> <u>Base</u>	<u>FY 2024</u> <u>OCO</u>	<u>FY 2024</u> <u>Total</u>	<u>FY 2025</u>	<u>FY 2026</u>	<u>FY 2027</u>	<u>FY 2028</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
• EN5: <i>Enabling Investments (SDD)</i>	-	13.392	13.835	-	13.835	13.884	14.179	14.197	14.261	Continuing	Continuing
Remarks											

D. Acquisition Strategy
CHEM BIO INCIDENT PREPAREDNESS AND RESPONSE - (CBIPR-ADM)

CBIPR-ADM establishes new capability-building efforts such as manufacturing platforms using U.S. Food & Drug Administration (FDA) known technologies and infrastructure improvements that will enable new additional medical countermeasure (MCM) product development. This line ensures the DOD ADM is in a state of operational readiness so that it can continue to be an enduring domestic MCM manufacturing capability that provides the DoD with priority access. In FY24 CBIPR-ADM will implement a facility-agnostic approach for tech transferring and enhancing new manufacturing technologies and infrastructure to support the development and manufacturing of MCMs against chemical/biological threats. This approach ensures that these efforts are not limited to a single facility in order to provide rapid response

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Chemical and Biological Defense Program **Date:** March 2023

Appropriation/Budget Activity	R-1 Program Element (Number/Name)	Project (Number/Name)
0400 / 4	PE 0603884BP / <i>Chemical and Biological Defense Program - Dem/Val</i>	EN4 / <i>Enabling Investments (ACD&P)</i>

to known and unknown threats. New manufacturing technologies can come from any government sources (including JSTO, WRAIR, BARDA, etc. when mature enough for BA4 funding) and other external sources and targets of opportunity from industry.

Medical Countermeasures Manufacturing Optimization

MCM MFRO will leverage industrial base partnerships and buy down risks to manufacturing by prioritizing onshoring of key chemicals (active pharmaceutical ingredients (API) and key starting materials (KSMs)) critical to produce DoD-unique enhanced biodefense medical countermeasure needs. Additionally, increased use of computational tools and manufacturing controls will reduce the risk associated with cost per dose and time to field, as well as enhance FDA regulatory compliance.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Chemical and Biological Defense Program **Date:** March 2023

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603884BP / Chemical and Biological Defense Program - Dem/Val	Project (Number/Name) EN4 / Enabling Investments (ACD&P)
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Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
CBIPR-ADM - Capability Establishment (Establish "Cell Free" Manufacturing Platform)	C/CPFF	Ology : Alachua, FL	-	0.000		6.473	Dec 2022	8.830	Dec 2023	-		8.830	Continuing	Continuing	0.000
CBIPR-ADM - Product Management Support	C/CPFF	Various : N/A	-	0.000		0.308	Dec 2022	0.342	Jan 2024	-		0.342	Continuing	Continuing	0.000
MCM MFRO - Development	Various	TBD : N/A	-	0.000		0.000		35.052	Dec 2024	-		35.052	Continuing	Continuing	0.000
Subtotal			-	0.000		6.781		44.224		-		44.224	Continuing	Continuing	N/A

Management Services (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
MCM MFRO - Program Management	Various	Various : N/A	-	0.000		0.000		3.048	Dec 2024	-		3.048	Continuing	Continuing	0.000
Subtotal			-	0.000		0.000		3.048		-		3.048	Continuing	Continuing	N/A

Project Cost Totals	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
-	-	0.000	6.781	47.272	-	47.272	Continuing	Continuing	N/A

Remarks

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Exhibit R-4, RDT&E Schedule Profile: PB 2024 Chemical and Biological Defense Program		Date: March 2023
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603884BP / <i>Chemical and Biological Defense Program - Dem/Val</i>	Project (Number/Name) EN4 / <i>Enabling Investments (ACD&P)</i>

	FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027				FY 2028			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
CBIPR-ADM - MCM Enabling Manufacturing Technologies	[REDACTED]																											
CBIPR-ADM - MCM Development and Manufacturing Support (Infrastructure)	[REDACTED]																											
MCM MFRO - Biologics Molecular Optimization	[REDACTED]																											
MCM MFRO - Small molecule synthesis and scale up	[REDACTED]																											
MCM MFRO - Process Efficiency Study	[REDACTED]																											

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Chemical and Biological Defense Program		Date: March 2023
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Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
CBIPR-ADM - MCM Enabling Manufacturing Technologies	1	2022	4	2028
CBIPR-ADM - MCM Development and Manufacturing Support (Infrastructure)	1	2022	4	2028
MCM MFRO - Biologics Molecular Optimization	1	2024	4	2028
MCM MFRO - Small molecule synthesis and scale up	1	2024	4	2028
MCM MFRO - Process Efficiency Study	1	2024	4	2024

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Chemical and Biological Defense Program										Date: March 2023		
Appropriation/Budget Activity 0400 / 4					R-1 Program Element (Number/Name) PE 0603884BP / Chemical and Biological Defense Program - Dem/Val				Project (Number/Name) CA4 / Contamination Avoidance (ACD&P)			
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
CA4: Contamination Avoidance (ACD&P)	-	37.189	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	37.189
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Contamination Avoidance Advanced Component Development and Prototypes (ACD&P) Project supports reconnaissance, detection, identification, and hazard prediction equipment, hardware, and software. After FY 2022, the Chemical Biological Defense Program (CBDP) RDT&E Projects were restructured to align with the CBDP portfolio construct. CA4 efforts in FY 2022 progress to Project UN4. This restructuring provides standardization and alignment across CBDP research, development and acquisition efforts.

Efforts included in this Project are:

- (1) Advanced Emerging Threat Defense (AET DEFENSE) **Progresses to UN4 in FY2023**,
- (2) CBRN Support to Command and Control (CSC2) **Progresses to UN4 in FY2023** , and
- (3) Compact Vapor Chemical Agent Detector (CVCAD) **Progresses to UN4 in FY2023**

The AET DEFENSE program continues to address the highest priority CBRN gaps and supports the Chemical Biological Defense Program (CBDP) Strategic Line of Effort to meet current and emerging threats by anticipating CB hazards and developing capabilities to counter emerging and future threats. The AET Defense program collaborates with the Joint Services, interagency, and international partners to align RDT&E resources to determine readiness against emerging threats, to include NTAs, such as Novichoks and Pharmaceutical-Based Agents (PBA) (e.g. synthetic opioids), emerging biological threats, and other advanced and emerging threats as they are identified across the entire CBDP enterprise portfolio.

CSC2 is the overarching System of Systems (SoS) that provides for the interoperability and integration of CBRN and Non CBRN sensors to achieve needed situational awareness and understanding to accomplish CBRN integrated layered defense, interdependent with Service and Mission Partner Common Operating Environments and Computing Environments (CoE/CE). This is not achievable in current Command and Control constructs. CSC2 addresses this objective by establishing a Service and Joint All Domain Command and Control (JADC2) compatible CBRN CoE architecture and deployment environments.

This consolidates CSC2 with Modernization CBRN Information Systems (MOD CBRN IS) in order to gain efficiencies of managing funding and programmatic efforts under one line. Additionally, it allows the consolidation of continuous engineering for the currently deployed legacy CBRN information systems (Joint Effects Model (JEM)/Joint Warning and Reporting Network (JWARN), CBRN Information System (CBRN IS)). This maintains the stopgap capability for CBRN warning, reporting, and effects modeling while setting conditions for the sun setting of the legacy capabilities replaced by CSC2 capabilities beginning in FY27. The approach to consolidate simplifies software BA7 management under one line (like the BA7 in other CBDP commodity areas) and synchronizes the sunset of legacy JEM and JWARN capabilities as replacement capabilities are deployed through CSC2.

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Chemical and Biological Defense Program		Date: March 2023
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603884BP / Chemical and Biological Defense Program - Dem/Val	Project (Number/Name) CA4 / Contamination Avoidance (ACD&P)

CVCAD is designed to be an unobtrusive, low-profile chemical detection capability that will continuously, and autonomously, monitor and alert general and specialized units to an unsafe environment without further burdening the warfighters payload or interfering with the primary mission. The small form factor (less than 2 lbs.) is amenable to both man-worn and unmanned aerial or ground system operations to enable timely personnel protective action and other force protection decisions. In FY24 after milestone B decisions competing prototypes will undergo down selects based on performance and a Technology Readiness Assessment and execute engineering manufacturing and development phase and conduct development and operational testing.

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2022	FY 2023	FY 2024
Title: 1) AET DEFENSE Description: Program Management, Product Development, Support and Testing to demonstrate and evaluate technologies to assess performance against advanced and emerging threats.	10.074	-	-
Title: 2) CSC2 Description: Automated Warning, Reporting , Analysis and decision support tools. Service Common Operating Environment (COE) and CoE Convergence.	4.400	-	-
Title: 3) CSC2 Description: Program Management and Support	2.321	-	-
Title: 4) CSC2 Description: Product Development, Integration and Sensor Management	14.174	-	-
Title: 5) CVCAD Description: Prototype Advanced Development, Testing & Program Management	6.220	-	-
Accomplishments/Planned Programs Subtotals	37.189	-	-

C. Other Program Funding Summary (\$ in Millions)											
Line Item	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
• CA5: Contamination Avoidance (SDD)	84.967	-	-	-	-	-	-	-	-	0.000	84.967
• UN4: Understand (ACD&P)	-	52.708	61.638	-	61.638	64.399	48.874	41.264	38.169	Continuing	Continuing
• UN5: Understand (SDD)	-	126.071	182.726	-	182.726	137.991	127.671	108.908	68.088	Continuing	Continuing

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Chemical and Biological Defense Program **Date:** March 2023

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603884BP / Chemical and Biological Defense Program - Dem/Val	Project (Number/Name) CA4 / Contamination Avoidance (ACD&P)
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C. Other Program Funding Summary (\$ in Millions)

Line Item	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
• SA0005: CBRN Sensor Integration On Robotic Platforms (CSIRP)	3.461	2.099	-	-	-	-	-	-	-	0.000	6.063
• SA0050: CBRN Support to C2 (CSC2)	1.750	11.803	2.186	-	2.186	2.257	2.366	2.451	2.549	Continuing	Continuing

Remarks

D. Acquisition Strategy

ADVANCED AND EMERGING THREAT DEFENSE (AET DEFENSE)

The AET DEFENSE program will use a variety of acquisition approaches to survey, develop, assess, and rapidly field technologies to inform and fill advanced and emerging threat gaps. The program will utilize an existing Multiple Award Indefinite Delivery Indefinite Quantify Task Order Contract to provide technical support to studies and assessments of performance against emerging threats. For Program of Record (PoR) systems currently in development that will be assessed for performance against emerging threats, those PoR's existing contracts will be modified to incorporate development engineering and test support for emerging threat capability. The AET DEFENSE program will utilize OTAs for system development and prototyping activities and Government Agencies and Federally Funded Research and Development Centers to provide development, testing and technical support.

CBRN SUPPORT TO C2 (CSC2)

CSC2 focuses on technology maturation, demonstration, integration and transitioning early warning capability sets to fielded Chemical Biological Defense Program (CBDP) programs of record to combat emerging and potentially urgent threats within Joint All Domain Operations. Contracting strategy includes the use of Other Transaction Authority Research & Development and prototyping. Annual development cycles and capability drops are requested and validated by all Department of Defense (DoD) Services in the Assistant Secretary of Defense (NCB/CB) Integrated Early Warning (IEW) Campaign Plan as well as approved capability development packages designated through the Joint Requirements Office and prioritized based on National Defense Strategy and National Military Strategy goals. Current strategy also collaborates with multi-agency partners to obtain synergy and interoperability across the areas of sensor data analytics, integrated early warning, and protect to warn/protect to treat capabilities. Efforts within CSC2 are driven by Service Chemical Biological Radiological and Nuclear (CBRN) capability gaps that are identified on an annual basis and evaluated by CBDP stakeholders; possible solutions and applicable technologies within the CBDP will be experimented, integrated, networked, and deployed through the software acquisition pathway.

COMPACT VAPOR CHEMICAL AGENT DETECTOR (CVCAD)

The CVCAD program will use the Combating Weapons of Mass Destruction Other Transaction Authority (CWMD OTA) contract vehicle to transition four technologies from Science & Technology (S&T) into the program of record. This streamlined acquisition approach is broken into four phases uses one contracting mechanism to

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Chemical and Biological Defense Program		Date: March 2023
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award one contract with follow-on acquisition awards; Phase I S&T advanced development, Phase II technology transition maturation evaluation, Phase III competitive prototyping down select and Engineering decision. Phase IV will execute Production and Development for low rate initial production systems.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Chemical and Biological Defense Program **Date:** March 2023

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Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
AET DEFENSE - HW C - Emerging threat detection/decontamination/protection capability prototyping	Various	Various : N/A	-	1.436	Dec 2021	0.000		0.000		-		0.000	0.000	1.436	0.000
AET DEFENSE - SW C - Spectral library enhancements	MIPR	U.S. Army Combat Capabilities Development Command (DEVCOM) Chemical Biological Center (CBC) : Aberdeen Proving Ground, MD	-	2.021	Nov 2021	0.000		0.000		-		0.000	0.000	2.021	0.000
AET DEFENSE - SW C - Hazard awareness tool updates	MIPR	U.S. Army Combat Capabilities Development Command (DEVCOM) Chemical Biological Center (CBC) : Aberdeen Proving Ground, MD	-	1.376	Dec 2021	0.000		0.000		-		0.000	0.000	1.376	0.000
AET DEFENSE - SW C - Physiological Monitoring Architecture	MIPR	Various : N/A	-	2.190	Aug 2022	0.000		0.000		-		0.000	0.000	2.190	0.000
CSC2 - HW C - Contractor Product Development Team Labor	MIPR	JPEO Chem, Bio, Rad, and Nuc Defense (JPEO-CBRND) : Aberdeen Proving Ground, MD	-	0.500	Feb 2022	0.000		0.000		-		0.000	0.000	0.500	0.000
CSC2 - HW C - Operational Capability	C/CPAF	Various : N/A	-	12.074	Feb 2022	0.000		0.000		-		0.000	0.000	12.074	0.000
CSC2 - HW - C Government Product Development Team Labor	MIPR	Various : N/A	-	2.500	Oct 2021	0.000		0.000		-		0.000	0.000	2.500	0.000
CVCAD - HW S - Government Team Labor	Various	Various : N/A	0.581	0.690	Nov 2021	0.000		0.000		-		0.000	0.000	1.271	0.000

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Chemical and Biological Defense Program **Date:** March 2023

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Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
CVCAD - HW S - Advanced Prototype Development	C/FFP	Advanced Technologies International : Summerville, SC	-	3.856	Oct 2021	0.000		0.000		-		0.000	0.000	3.856	0.000
Subtotal			0.581	26.643		0.000		0.000		-		0.000	0.000	27.224	N/A

Support (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
CSC2 - ES C - Contractor Support	C/CPAF	TBD : N/A,	-	0.800	May 2022	0.000		0.000		-		0.000	0.000	0.800	0.000
CSC2 - ES C - Support	MIPR	TBD : N/A,	-	0.700	May 2022	0.000		0.000		-		0.000	0.000	0.700	0.000
CVCAD - ES S - Other Government Agency Developmental Support	MIPR	Various : N/A	-	0.600	Nov 2021	0.000		0.000		-		0.000	0.000	0.600	0.000
Subtotal			-	2.100		0.000		0.000		-		0.000	0.000	2.100	N/A

Test and Evaluation (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
AET DEFENSE - DTE S - Technology Assessments	MIPR	U.S. Army Combat Capabilities Development Command (DEVCOM) Chemical Biological Center (CBC) : Aberdeen Proving Ground, MD	-	1.556	Dec 2021	0.000		0.000		-		0.000	0.000	1.556	0.000
CSC2 - DTE C - Technical/Operational Demo	MIPR	JPEO Chem, Bio, Rad, and Nuc Defense (JPEO-	-	2.000	Jun 2022	0.000		0.000		-		0.000	0.000	2.000	0.000

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Chemical and Biological Defense Program **Date:** March 2023

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Test and Evaluation (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
		CBRND) : Aberdeen Proving Ground, MD													
CVCAD - DTE S - Chemical Surety Testing	MIPR	U.S. Army Combat Capabilities Development Command (DEVCOM) Chemical Biological Center (CBC) : Aberdeen Proving Ground, MD	-	0.440	Aug 2022	0.000		0.000		-		0.000	0.000	0.440	0.000
CVCAD - DTE S - MIL-STD Testing	MIPR	Aberdeen Test Center (ATC) : Aberdeen Proving Ground, MD	-	0.080	Jun 2022	0.000		0.000		-		0.000	0.000	0.080	0.000
Subtotal			-	4.076		0.000		0.000		-		0.000	0.000	4.076	N/A

Management Services (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
AET DEFENSE - PM/MS S - IPT Support/Program Management	MIPR	U.S. Army Combat Capabilities Development Command (DEVCOM) Chemical Biological Center (CBC) : Aberdeen Proving Ground, MD	-	1.495	Dec 2021	0.000		0.000		-		0.000	0.000	1.495	0.000
CSC2 - PM/MS C - Program Management Support	MIPR	Various : N/A	-	2.321	Oct 2021	0.000		0.000		-		0.000	0.000	2.321	0.000
CVCAD - PM/MS S - Program Management Support	MIPR	Various : N/A	0.080	0.554	Nov 2021	0.000		0.000		-		0.000	0.000	0.634	0.000

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Chemical and Biological Defense Program **Date:** March 2023

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Management Services (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Subtotal			0.080	4.370		0.000		0.000		-		0.000	0.000	4.450	N/A
Project Cost Totals			0.661	37.189		0.000		0.000		-		0.000	0.000	37.850	N/A

Remarks

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Exhibit R-4, RDT&E Schedule Profile: PB 2024 Chemical and Biological Defense Program **Date:** March 2023

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FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027				FY 2028			
1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4

AET DEFENSE - Technology Assessments/ Systems Engineering																												
CSC2 - SWP Execution Phase Decision																												
CSC2 - Continuous Software DT/OT																												
CSC2 - MVP (CDP-1)																												
CSC2 - Service Common Operating Environment Integration																												
CSC2 - Cyber Security Compliance																												
CSC2 - CD-Capability Drop - MVCR Delivery 1 (CDP-1)																												
CSC2 - MVP (CDP-2)																												
CSC2 - Continuous Engineering & Software Updates																												
CSC2 - Operating System Architecture Updates																												
CSC2 - CD-Capability Drop - MVCR Delivery 2 (CDP-2)																												
CSC2 - Future MVPs																												
CSC2 - CD-Capability Drop - Future MVCR Deliveries																												
CVCAD - CDD Validation-Capability Development Document Validation																												
CVCAD - MS B-Milestone B																												
CVCAD - CDR-Critical Design Review																												
CVCAD - CDD Update																												
CVCAD - MS C-Milestone C																												

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Exhibit R-4, RDT&E Schedule Profile: PB 2024 Chemical and Biological Defense Program **Date:** March 2023

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603884BP / <i>Chemical and Biological Defense Program - Dem/Val</i>	Project (Number/Name) CA4 / <i>Contamination Avoidance (ACD&P)</i>
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	FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027				FY 2028			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4

CVCAD - LRIP-Low Rate Initial Production	█																											
CVCAD - FRP-Full Rate Production Decision	█																											
CVCAD - IOC-Initial Operational Capability	█																											
CVCAD - FOC-Full Operational Capability	█																											

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Chemical and Biological Defense Program		Date: March 2023
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Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
AET DEFENSE - Technology Assessments/Systems Engineering	1	2022	4	2028
CSC2 - SWP Execution Phase Decision	2	2023	2	2023
CSC2 - Continuous Software DT/OT	3	2023	4	2028
CSC2 - MVP (CDP-1)	4	2023	4	2023
CSC2 - Service Common Operating Environment Integration	1	2024	4	2028
CSC2 - Cyber Security Compliance	1	2024	4	2028
CSC2 - CD-Capability Drop - MVCR Delivery 1 (CDP-1)	4	2024	4	2025
CSC2 - MVP (CDP-2)	4	2024	4	2024
CSC2 - Continuous Engineering & Software Updates	1	2025	4	2028
CSC2 - Operating System Architecture Updates	1	2025	4	2028
CSC2 - CD-Capability Drop - MVCR Delivery 2 (CDP-2)	4	2025	4	2026
CSC2 - Future MVPs	2	2026	4	2028
CSC2 - CD-Capability Drop - Future MVCR Deliveries	4	2026	4	2028
CVCAD - CDD Validation-Capability Development Document Validation	3	2023	3	2023
CVCAD - MS B-Milestone B	4	2023	4	2023
CVCAD - CDR-Critical Design Review	3	2024	3	2024
CVCAD - CDD Update	3	2025	3	2025
CVCAD - MS C-Milestone C	4	2025	4	2025
CVCAD - LRIP-Low Rate Initial Production	4	2026	4	2026
CVCAD - FRP-Full Rate Production Decision	4	2027	4	2027
CVCAD - IOC-Initial Operational Capability	4	2028	4	2028
CVCAD - FOC-Full Operational Capability	4	2028	4	2028

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Chemical and Biological Defense Program **Date:** March 2023

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COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
DE4: <i>Decontamination (ACD&P)</i>	-	14.747	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	14.747
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-	-	-

A. Mission Description and Budget Item Justification

This project supports the development of Contamination Mitigation (ConMit) systems that reduce operational impact and logistics burden, reduce sustainment costs, increase safety, and minimize environmental effects associated with decontamination and contamination mitigation operations. These efforts align with Chemical, Biological, Radiological, and Nuclear the National Defense Strategy by prioritizing preparedness for war and sustaining Joint Force military advantage and resilient force posture. After FY 2022, the Chemical Biological Defense Program (CBDP) RDT&E Projects were restructured to align with the CBDP portfolio construct. DE4 efforts in FY 2022 progress to Project MT4. This restructuring provides standardization and alignment across CBDP research, development and acquisition efforts.

Efforts included in this Project are:

- (1) Chemical, Biological, Radiological, and Nuclear (CBRN) Covers, Coatings and Protective Overlays (C3PO),
- (2) Service Equipment Decontamination System (SEDS) ****Progresses to MT4 in FY2023****,
- (3) Tactical Contamination Mitigation System (TCMS) ****Progresses to MT4 in FY2023****, and
- (4) Wide Area Decontamination System (WADS)

The Chemical Biological Coverings Coatings and Protective Overlays (C3PO) program, uses a Family of Systems approach to provide contamination mitigation capability to critical equipment and assets prior to a Chemical, Biological, Radiological and Nuclear (CBRN) attack. This mitigates the effects and amount of CBRN contamination exposure allowing the Joint Force to be better prepared for war, maintain a resilient force posture, and remain lethal. These capabilities include CBRN protective covers, coatings, paints, and other preventative measures. In FY23 and beyond, the Chemical Biological Defense Program (CBDP) terminated the program for higher priorities. All programmatic documentation will be archived and the Joint Requirements Office will archive the Draft Capability Development Document.

The Service Equipment Decontamination System (SEDS) program consists of two efforts, Joint SEDS and Special Operations Forces (SOF) Critical Equipment Decontamination (CEDS), the program will develop a capability for use by the Warfighter during the decontamination operations that will provide a quantifiable reduction in the number of personnel experiencing adverse health effects by reducing contamination on equipment, individual combat equipment, and sensitive platform interiors. This capability is needed to sustain both the Joint and SOF by reducing logistical burdens in order to increase tactical agility and sustain a resilient force posture, and align with the National Defense Strategy (NDS). SEDS and CEDS will provide contamination mitigation capabilities for critical equipment that have been exposed to chemical and biological contamination and achieve efficacy levels that allow unprotected post-decontamination exposures for long periods with less than negligible severity effects. In FY24, the Joint SEDS effort will continue through the Engineering and Manufacturing Development (EMD) phase with Developmental Testing (DT) and a Critical Design Review (CDR). FY23 is last year of BA4 funding, program is transitioning to EMD.

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Chemical and Biological Defense Program **Date:** March 2023

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Tactical Containment Mitigation System (TCMS) is a Contamination Mitigation concept and intends to address gaps related to the decontamination of critical equipment and vehicles and it will reduce the time and logistics associated with decontamination. TCMS will limit the spread and mitigate the effects of Chemical, Biological, and Radiological (CBR) contamination to allow warfighters to continue their mission for an extended period of time in a high threat, CBR contaminated environment. The Program's intent is to mitigate the risk to personnel and limit the potential spread of CBR contamination by minimizing contact and transfer hazards. TCMS will greatly enhance or eliminate the need for subsequent decontamination to mitigate contamination on military equipment. Following application of TCMS, combined with weathering, Mission Oriented Protective Posture (MOPP) levels may be reduced without further decontamination, depending on the surface or material being decontaminated and the agent. In FY24 the program will continue prototype testing and complete technical reviews in support of the MS B/Engineering Manufacturing & Development (EMD) Phase. TCMS was a new start in FY22 and FY24 is the last year of BA4 funding as the program transitions to the EMD Phase.

The Wide Area Decontamination System (WADS), a new start program in FY22, will provide contamination mitigation capabilities against chemical and biological warfare agents on various types of terrain and exterior of fixed site facilities. The WADS will be employed to conduct Airport of Debarcation, Seaport of Debarcation, Terrain, Fix Site and Anti-access/Anti-denial decontamination operations. The WADS will be a replacement for the M12. The M12A1, Power Driven Decontamination Apparatus (PDDA) system is an Army lead program that consists of a pump unit, a 500 gallon tank unit, and a 600 gallon per hour liquid fuel water heater with a spray bar mounted to the system for terrain decontamination. The WADS will use the principles of the PDDA to further enhance terrain decontamination capabilities. In FY23 and beyond, the Chemical Biological Defense Program (CBDP) reduced the program for higher priorities. All programmatic documentation will be archived and the Joint Requirements Office will enter the Draft Capability Development Document in the Knowledge Management/Decision Support tool for Archiving.

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2022	FY 2023	FY 2024
Title: 1) C3PO Description: Prototype Development	2.893	-	-
Title: 2) SEDS - JOINT Description: Milestone (MS) B support and Prototype Development.	4.339	-	-
Title: 3) SEDS - SOF Description: Milestone (MS) B Support and Prototype Development	4.485	-	-
Title: 4) TCMS Description: Milestone (MS) A support and Prototype Development	2.354	-	-
Title: 5) WADS Description: Prototype Development and Evaluation	0.676	-	-
Accomplishments/Planned Programs Subtotals	14.747	-	-

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Chemical and Biological Defense Program **Date:** March 2023

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C. Other Program Funding Summary (\$ in Millions)

Line Item	FY 2022	FY 2023	FY 2024	FY 2024	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028	Cost To	
			Base	OCO	Total					Complete	Total Cost
• DE5: <i>Decontamination (SDD)</i>	7.485	-	-	-	-	-	-	-	-	0.000	7.485
• MT4: <i>Mitigate (ACD&P)</i>	-	17.302	28.785	-	28.785	20.885	15.433	13.369	-	Continuing	Continuing
• MT5: <i>Mitigate (SDD)</i>	-	74.225	88.441	-	88.441	92.279	91.431	87.773	93.250	Continuing	Continuing
• PHM007: <i>Service Equipment Decontamination System (SEDS)</i>	-	-	-	-	-	14.028	22.531	24.920	13.050	Continuing	Continuing
• PHM042: <i>Tactical Contamination Mitigation System (TCMS)</i>	-	-	-	-	-	-	1.250	5.072	5.000	Continuing	Continuing

Remarks

D. Acquisition Strategy

CBRN COVERS COATINGS AND PROTECTIVE OVERLAYS (C3PO)

The Chemical Biological Coverings Coatings and Protective Overlays (C3PO) program acquisition approach involves testing fielded material against live chemical warfare agents and biological warfare agents. The C3PO program will evaluate Government and Commercial Off the Shelf options to reduce development costs. The program will test Government and Commercial Off the Shelf options against live chemical warfare agents and biological warfare agents, conduct regular user evaluations to identify human system integration issues, and will conduct testing to ensure the system meets military standards. The C3PO program funding ends in FY22 and all program contract, test, and acquisition documentation will be archived and the Joint Requirements Office will archive the Draft Capability Development Document.

SERVICE EQUIPMENT DECONTAMINATION SYSTEM (SEDS)

The Joint Service Equipment Decontamination System (SEDS) and Special Operations Forces (SOF) Critical Equipment Decontamination System (CEDS) program will utilize the Countering Weapons of Mass Destruction Other Transaction Authority (CWMD OTA) to design and develop state of the art equipment using competitive and iterative prototyping. The program will test prototypes against live chemical warfare agents and biological warfare agents, conduct reliability, availability, and maintainability testing, conduct regular user evaluations to identify human system integration issues, and will conduct testing to ensure the system meets military standards. The program will use the Request for Prototype Proposals (RPP), under the CWMD OTA, followed by Prototype Agreement awards. Milestone B approval is planned in FY23 for the United States Special Operations Command (SOCOM) and Joint Service variant. During the FY24-28 FYDP the SOCOM CEDS effort is planning to achieve a successful Milestone C decision and enter Full Rate Production, leading to an initial operational capability and reaching full operational capability by FY28.

TACTICAL CONTAMINATION MITIGATION SYSTEM (TCMS)

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Chemical and Biological Defense Program	Date: March 2023
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Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603884BP / <i>Chemical and Biological Defense Program - Dem/Val</i>	Project (Number/Name) DE4 / <i>Decontamination (ACD&P)</i>
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The Tactical Containment Mitigation System (TCMS) program will develop the equipment, processes and procedures for contamination mitigation related to post-incident operations in a Chemical Biological Radiological and Nuclear (CBRN) contaminated environment. The acquisition strategy includes market research through both Requests for Information (RFIs) and a call for White Papers through an Other Transaction Authority (OTA) contracting approach. Data collected will inform a Milestone A decision in FY23. The OTA vehicle will also be used to request prototypes, which will undergo technology demonstrations and Early Field testing, followed by an analysis to determine the most suitable candidate. Results of Prototyping will inform Milestone B and Request for Proposals (RFPs) followed by developmental and operational testing and Milestone C/Full Rate Production Approval.

WIDE AREA DECONTAMINATION SYSTEM (WADS)

The Wide Area Decontamination System (WADS) program will develop the equipment, processes and procedures for contamination mitigation of various types of terrain and the exterior of Department of Defense (DoD) fixed site facilities contaminated by chemical, biological, and radiological agents. The acquisition strategy includes market research through both Requests for Information (RFIs) and a call for White Papers through an Other Transaction Authority (OTA) contracting approach. The OTA vehicle will also be used to request prototypes, which will undergo technology demonstrations and Early Field testing, followed by an analysis to determine the most suitable candidate. The WADS program funding ends in FY22 and all program contract, test, and acquisition documentation will be archived and the Joint Requirements Office will enter the Draft Capability Development Document into Knowledge Management/Decision Support tool for archiving.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Chemical and Biological Defense Program **Date:** March 2023

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603884BP / Chemical and Biological Defense Program - Dem/Val	Project (Number/Name) DE4 / Decontamination (ACD&P)
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Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
C3PO - HW S - Advanced Product Development	Various	Various : N/A	0.203	0.208	Nov 2021	0.000		0.000		-		0.000	0.000	0.411	0.000
SEDS - HW S - SEDS - Product Development	SS/FFP	TBD : N/A	-	0.896	Aug 2022	0.000		0.000		-		0.000	0.000	0.896	0.000
SEDS - CEDS	C/FFP	Various : N/A	-	0.992	Aug 2022	0.000		0.000		-		0.000	0.000	0.992	0.000
TCMS - HW S - Product Development	C/FFP	TBD : N/A	-	0.784	Sep 2022	0.000		0.000		-		0.000	0.000	0.784	0.000
WADS - HW C - Autonomous Contamination Mitigation Prototype	C/FFP	TBD : N/A	-	0.676	Sep 2022	0.000		0.000		-		0.000	0.000	0.676	0.000
Subtotal			0.203	3.556		0.000		0.000		-		0.000	0.000	3.759	N/A

Support (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
C3PO - ILS S - Logistics, Engineering and IPT Support	MIPR	Various : N/A	0.525	0.434	Nov 2021	0.000		0.000		-		0.000	0.000	0.959	0.000
SEDS - ES S - SEDS - Logistics, Engineering and IPT Support	MIPR	Various : N/A	0.066	0.651	Oct 2021	0.000		0.000		-		0.000	0.000	0.717	0.000
SEDS - CEDS	MIPR	Various : N/A	-	0.852	Nov 2021	0.000		0.000		-		0.000	0.000	0.852	0.000
TCMS - ES S - Logistics, Engineering and IPT Support	MIPR	Various : N/A	-	0.353	Jun 2022	0.000		0.000		-		0.000	0.000	0.353	0.000
Subtotal			0.591	2.290		0.000		0.000		-		0.000	0.000	2.881	N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Chemical and Biological Defense Program **Date:** March 2023

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603884BP / Chemical and Biological Defense Program - Dem/Val	Project (Number/Name) DE4 / Decontamination (ACD&P)
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Test and Evaluation (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
C3PO - OTHT S - Other S - Developmental Testing and Test Planning Support	MIPR	Various : N/A	0.784	2.035	Dec 2021	0.000		0.000		-		0.000	0.000	2.819	0.000
SEDS - OTHT S - SEDS - T&E IPR Test Planning	MIPR	Various : N/A	0.562	2.459	Nov 2021	0.000		0.000		-		0.000	0.000	3.021	0.000
SEDS - CEDS	MIPR	Various : N/A	-	2.316	Sep 2022	0.000		0.000		-		0.000	0.000	2.316	0.000
TCMS - OTHT S - Prototype T&E IPR Test Planning	MIPR	Various : N/A	-	1.041	Jun 2022	0.000		0.000		-		0.000	0.000	1.041	0.000
Subtotal			1.346	7.851		0.000		0.000		-		0.000	0.000	9.197	N/A

Management Services (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
C3PO - PM/MS S - PM/MS S - Program Management Support	MIPR	Various : N/A	0.131	0.216	Nov 2021	0.000		0.000		-		0.000	0.000	0.347	0.000
SEDS - PM/MS S - SEDS - Program Management Support	MIPR	Various : N/A	0.251	0.324	Jan 2022	0.000		0.000		-		0.000	0.000	0.575	0.000
SEDS - CEDS	MIPR	Various : N/A	-	0.334	Nov 2021	0.000		0.000		-		0.000	0.000	0.334	0.000
TCMS - PM/MS S - Program Management Support	Various	TBD : N/A	-	0.176	May 2022	0.000		0.000		-		0.000	0.000	0.176	0.000
Subtotal			0.382	1.050		0.000		0.000		-		0.000	0.000	1.432	N/A

	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals		2.522	14.747	0.000	0.000	0.000	0.000	17.269	N/A

Remarks

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Exhibit R-4, RDT&E Schedule Profile: PB 2024 Chemical and Biological Defense Program		Date: March 2023
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603884BP / <i>Chemical and Biological Defense Program - Dem/Val</i>	Project (Number/Name) DE4 / <i>Decontamination (ACD&P)</i>

	FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027				FY 2028			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4

C3PO - Proof of Concept Demonstration and Testing	██████████																							
C3PO - Government and Commercial Off the Shelf Options Testing	██████████																							
C3PO - Prepare Programmatic Acquisition Documentation for Archive					██████████																			
C3PO - Prepare final program report					██████████																			
SEDS - Prototype Agreement Award (SOF and Other Services)					██████																			
SEDS - CDD Validation-Capability Development Document Validation - Other Services					██████████																			
SEDS - Early Developmental Testing (Other Services)					██████████																			
SEDS - MS B-Milestone B - Other Services									██████															
SEDS - DT&E-Developmental Test and Evaluation - Other Services									████████████████████															
SEDS - MS C-Milestone C - Other Services													██████											
SEDS - FRP-Full Rate Production Decision - Other Services																	██████							
SEDS - DT&E-Developmental Test and Evaluation - SOF	████████████████████																							
SEDS - RFP-Development Request for Proposal Release Decision - SOF and Other Services					██████																			
SEDS - MS B-Milestone B - SOF					██████																			
SEDS - MS C-Milestone C - SOF									██████															

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Exhibit R-4, RDT&E Schedule Profile: PB 2024 Chemical and Biological Defense Program **Date:** March 2023

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603884BP / Chemical and Biological Defense Program - Dem/Val	Project (Number/Name) DE4 / Decontamination (ACD&P)
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	FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027				FY 2028			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
SEDS - IOC-Initial Operational Capability - SOF																												
SEDS - FOC-Full Operational Capability - SOF																												
TCMS - Market Research																												
TCMS - RFP-Development Request for Proposal Release Decision																												
TCMS - Prototype Contract Award																												
TCMS - Life Cycle Sustainment Plan (LCSP)																												
TCMS - System Readiness Review (SRR)																												
TCMS - Test and Evaluation Master Plan (TEMP)																												
TCMS - Test Readiness Review (TRR)																												
TCMS - Simplified Acquisition Management Plan (SAMP)																												
TCMS - MS A-Milestone A																												
TCMS - Prototype Testing																												
TCMS - Acquisition Program Baseline (APB)																												
TCMS - CDD Validation-Capability Development Document Validation																												
TCMS - MS B-Milestone B																												
TCMS - DT&E-Developmental Test and Evaluation - Developmental Test & Evaluation																												
TCMS - System Verification Review/Production Readiness Review																												
TCMS - MS C-Milestone C																												
TCMS - FRP-Full Rate Production Decision																												
WADS - Market Research																												

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Exhibit R-4, RDT&E Schedule Profile: PB 2024 Chemical and Biological Defense Program																							Date: March 2023														
Appropriation/Budget Activity 0400 / 4										R-1 Program Element (Number/Name) PE 0603884BP / <i>Chemical and Biological Defense Program - Dem/Val</i>								Project (Number/Name) DE4 / <i>Decontamination (ACD&P)</i>																			
										FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027				FY 2028			
										1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
WADS - Prototype Development																																					
WADS - Prepare Programmatic Acquisition Documentation for Archive																																					

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Chemical and Biological Defense Program		Date: March 2023
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603884BP / <i>Chemical and Biological Defense Program - Dem/Val</i>	Project (Number/Name) DE4 / <i>Decontamination (ACD&P)</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
C3PO - Proof of Concept Demonstration and Testing	1	2022	1	2023
C3PO - Government and Commercial Off the Shelf Options Testing	1	2022	1	2023
C3PO - Prepare Programmatic Acquisition Documentation for Archive	4	2022	1	2023
C3PO - Prepare final program report	1	2023	2	2023
SEDS - Prototype Agreement Award (SOF and Other Services)	4	2022	4	2022
SEDS - CDD Validation-Capability Development Document Validation - Other Services	1	2023	2	2023
SEDS - Early Developmental Testing (Other Services)	1	2023	3	2023
SEDS - MS B-Milestone B - Other Services	4	2023	4	2023
SEDS - DT&E-Developmental Test and Evaluation - Other Services	1	2024	3	2025
SEDS - MS C-Milestone C - Other Services	3	2026	3	2026
SEDS - FRP-Full Rate Production Decision - Other Services	4	2027	4	2027
SEDS - DT&E-Developmental Test and Evaluation - SOF	3	2022	4	2023
SEDS - RFP-Development Request for Proposal Release Decision - SOF and Other Services	4	2022	4	2022
SEDS - MS B-Milestone B - SOF	3	2023	3	2023
SEDS - MS C-Milestone C - SOF	4	2024	4	2024
SEDS - IOC-Initial Operational Capability - SOF	2	2026	2	2026
SEDS - FOC-Full Operational Capability - SOF	4	2028	4	2028
TCMS - Market Research	1	2022	3	2022
TCMS - RFP-Development Request for Proposal Release Decision	3	2022	3	2022
TCMS - Prototype Contract Award	4	2022	4	2022
TCMS - Life Cycle Sustainment Plan (LCSP)	2	2023	2	2023

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Chemical and Biological Defense Program **Date:** March 2023

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603884BP / Chemical and Biological Defense Program - Dem/Val	Project (Number/Name) DE4 / Decontamination (ACD&P)
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Events	Start		End	
	Quarter	Year	Quarter	Year
TCMS - System Readiness Review (SRR)	2	2023	2	2023
TCMS - Test and Evaluation Master Plan (TEMP)	2	2023	2	2023
TCMS - Test Readiness Review (TRR)	3	2023	3	2023
TCMS - Simplified Acquisition Management Plan (SAMP)	3	2023	3	2023
TCMS - MS A-Milestone A	3	2023	3	2023
TCMS - Prototype Testing	1	2024	2	2024
TCMS - Acquisition Program Baseline (APB)	3	2024	3	2024
TCMS - CDD Validation-Capability Development Document Validation	2	2025	2	2025
TCMS - MS B-Milestone B	2	2025	2	2025
TCMS - DT&E-Developmental Test and Evaluation - Developmental Test & Evaluation	3	2025	3	2026
TCMS - System Verification Review/Production Readiness Review	3	2026	3	2026
TCMS - MS C-Milestone C	4	2026	4	2026
TCMS - FRP-Full Rate Production Decision	4	2027	4	2027
WADS - Market Research	3	2022	3	2022
WADS - Prototype Development	3	2022	3	2023
WADS - Prepare Programmatic Acquisition Documentation for Archive	4	2022	1	2023

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Chemical and Biological Defense Program **Date:** March 2023

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603884BP / Chemical and Biological Defense Program - Dem/Val	Project (Number/Name) IP4 / Individual Protection (ACD&P)
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COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
IP4: Individual Protection (ACD&P)	-	4.748	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	4.748
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-	-	-

A. Mission Description and Budget Item Justification

This project includes the development of next generation individual protective ensembles (e.g., suits, boots, and gloves) that enable the Joint Forces to survive and continue the mission in Chemical, Biological, and Radiological (CBR) contaminated environments. After FY 2022, the Chemical Biological Defense Program (CBDP) RDT&E Projects were restructured to align with the CBDP portfolio construct. IP4 efforts in FY 2022 progress to Project PT4. This restructuring provides standardization and alignment across CBDP research, development and acquisition efforts.

Efforts included in this Project are:

- (1) UIPE FoS Gloves **Progresses to PT5 in FY2023**

Uniform Integrated Protective Ensemble (UIPE) Family of Systems (FoS) Gloves provides percutaneous protection to the Warfighter against traditional and non-traditional Chemical, Biological, Radiological and Nuclear (CBRN) threats. UIPE FoS Gloves provides improved comfort, tactility and dexterity, and for some mission profiles advanced features such as touch screen and flame resistance. In FY22, UIPE FoS Gloves will finalize UIPE FoS Glove prototype development and testing for multiple mission profiles (General Purpose, Aviation Light and Aviation Heavy Variants) and conduct Developmental Testing (DT) events on mature prototypes. FY22 is the last year of BA4 funding.

B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2022	FY 2023	FY 2024
Title: 1) UIPE FOS GLOVES	4.748	-	-
Description: Development of the Next Generation Protective Glove			
Accomplishments/Planned Programs Subtotals	4.748	-	-

C. Other Program Funding Summary (\$ in Millions)

Line Item	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
• IP5: Individual Protection (SDD)	18.690	-	-	-	-	-	-	-	-	0.000	18.690
• PT5: Protect (SDD)	-	87.923	97.975	-	97.975	69.858	66.259	52.871	67.776	Continuing	Continuing

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Chemical and Biological Defense Program		Date: March 2023
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603884BP / <i>Chemical and Biological Defense Program - Dem/Val</i>	Project (Number/Name) IP4 / <i>Individual Protection (ACD&P)</i>

C. Other Program Funding Summary (\$ in Millions)

Line Item	FY 2022	FY 2023	FY 2024	FY 2024	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028	Cost To	
			Base	OCO	Total					Complete	Total Cost
• PHM032: <i>Uniform Integrated Protective Ensemble FOS Gloves (UIPE FOS GLOVES)</i>	-	-	4.978	-	4.978	6.215	7.974	8.328	8.926	Continuing	Continuing

Remarks

D. Acquisition Strategy

UNIFORM INTEGRATED PROTECTIVE ENSEMBLE FOS GLOVES (UIPE FOS GLOVES)

Uniform Integrated Protective Ensemble (UIPE) Family of Systems (FoS) Glove program conducted market research through both Requests For Information (RFIs) and a call for White Papers through an Other Transaction Authority (OTA) contracting approach. Eight white papers were deemed acceptable and will be pursued through a Mid-Tier Acquisition Rapid Prototyping strategy. Candidate technologies will undergo Early User Tests/Wear events and material and system level testing to identify available capabilities as well as Analytical framework analyses to determine the most suitable solution(s) per mission profile.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Chemical and Biological Defense Program **Date:** March 2023

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603884BP / Chemical and Biological Defense Program - Dem/Val	Project (Number/Name) IP4 / Individual Protection (ACD&P)
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Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
UIPE FOS GLOVES - HW C - Prototype Development	C/CPPF	ATI Solutions, Inc. : Tysons Corner, VA	0.100	0.033	Jan 2022	0.000		0.000		-		0.000	0.000	0.133	0.000
Subtotal			0.100	0.033		0.000		0.000		-		0.000	0.000	0.133	N/A

Support (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
UIPE FOS GLOVES - ES S - Engineering and Technical IPT Support / SME Support	MIPR	Various : N/A	0.113	0.712	Nov 2021	0.000		0.000		-		0.000	0.000	0.825	0.000
Subtotal			0.113	0.712		0.000		0.000		-		0.000	0.000	0.825	N/A

Test and Evaluation (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
UIPE FOS GLOVES - DTE C - Prototype Testing & Test Support	MIPR	Various : N/A	0.241	3.648	Nov 2021	0.000		0.000		-		0.000	0.000	3.889	0.000
Subtotal			0.241	3.648		0.000		0.000		-		0.000	0.000	3.889	N/A

Management Services (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
UIPE FOS GLOVES - PM/MS C - Program Management Support	Various	Various : N/A	0.040	0.355	Nov 2021	0.000		0.000		-		0.000	0.000	0.395	0.000
Subtotal			0.040	0.355		0.000		0.000		-		0.000	0.000	0.395	N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Chemical and Biological Defense Program								Date: March 2023			
Appropriation/Budget Activity 0400 / 4			R-1 Program Element (Number/Name) PE 0603884BP / Chemical and Biological Defense Program - Dem/Val				Project (Number/Name) IP4 / Individual Protection (ACD&P)				
	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract		
Project Cost Totals	0.494	4.748	0.000	0.000	-	0.000	0.000	5.242	N/A		

Remarks

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Exhibit R-4, RDT&E Schedule Profile: PB 2024 Chemical and Biological Defense Program **Date:** March 2023

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603884BP / <i>Chemical and Biological Defense Program - Dem/Val</i>	Project (Number/Name) IP4 / <i>Individual Protection (ACD&P)</i>
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	FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027				FY 2028			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4

UIPE FOS GLOVES - Early User, material and system level testing																												
UIPE FOS GLOVES - Mid-Tier Acquisition Rapid Prototype Initiation																												
UIPE FOS GLOVES - Mid-Tier Acquisition DT/OT																												
UIPE FOS GLOVES - Analytical Framework Analysis																												
UIPE FOS GLOVES - Mid-Tier Acquisition IPR																												
UIPE FOS GLOVES - Mid-Tier Acquisition Decision Point																												
UIPE FOS GLOVES - Mid-Tier Acquisition Rapid Fielding OR/Milestone C																												

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Chemical and Biological Defense Program		Date: March 2023
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603884BP / <i>Chemical and Biological Defense Program - Dem/Val</i>	Project (Number/Name) IP4 / <i>Individual Protection (ACD&P)</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
UIPE FOS GLOVES - Early User, material and system level testing	1	2022	2	2024
UIPE FOS GLOVES - Mid-Tier Acquisition Rapid Prototype Initiation	1	2022	1	2023
UIPE FOS GLOVES - Mid-Tier Acquisition DT/OT	2	2022	3	2024
UIPE FOS GLOVES - Analytical Framework Analysis	3	2022	4	2022
UIPE FOS GLOVES - Mid-Tier Acquisition IPR	3	2023	3	2023
UIPE FOS GLOVES - Mid-Tier Acquisition Decision Point	3	2024	3	2024
UIPE FOS GLOVES - Mid-Tier Acquisition Rapid Fielding OR/Milestone C	4	2024	4	2024

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Chemical and Biological Defense Program										Date: March 2023		
Appropriation/Budget Activity 0400 / 4					R-1 Program Element (Number/Name) PE 0603884BP / Chemical and Biological Defense Program - Dem/Val				Project (Number/Name) MB4 / Medical Biological Defense (ACD&P)			
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
MB4: Medical Biological Defense (ACD&P)	-	46.791	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	46.791
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This project includes Medical Countermeasure platform technologies, Medical Countermeasures (vaccines and therapeutics), development of reagents, assays, diagnostic equipment, biosurveillance and supporting efforts. After FY 2022, the Chemical Biological Defense Program (CBDP) RDT&E Projects were restructured to align with the CBDP portfolio construct. MB4 efforts in FY 2022 progress to Projects EN4 and PT4. This restructuring provides standardization and alignment across CBDP research, development and acquisition efforts.

Efforts included in this Project are:

- (1) COVID Therapies Monoclonal Antibodies (COVID TX MAB) **Progresses to PT4 in FY2023**,
- (2) Validated Nucleic Acid Vaccine Construction (COVID VAC) **Progresses to PT4 in FY2023**,
- (3) Chem Bio Incident Preparedness and Response - Advanced Development and Manufacturing (CBIPR - ADM) **Progresses to EN4 in FY2023**, and
- (4) Medical Countermeasure Platform Technologies (MCMPT) **Progresses to PT4 in FY2023**

The COVID TX MAB program will leverage lessons learned from the COVID response to rapidly discover, manufacture, and clinically evaluate new monoclonal antibodies to deliver short term capabilities against long standing biological threats. Monoclonal antibodies are a proven technology and first line of defense for many biological threats. In FY22, COVID TX MAB will target the discovery, identification and small scale manufacture of monoclonal antibodies (mAbs), with sufficient material to support non-clinical and clinical testing. In FY23 COVID TX MAB transitions to the Accelerated Antibodies-Enhanced Biodefense (AA-ENBD) program.

COVID VAC will leverage lessons learned from the Coronavirus Disease 2019 (COVID-19) response to shorten future emergency response timelines, mitigate impacts of biological threat outbreaks, and create interim capabilities to protect the warfighter. In FY 2022, COVID VAC will leverage interagency, industry, and academia partnerships to develop nucleic acid vaccines. COVID VAC will transition to Vaccine Acceleration by Modular Progression (VAMP) in FY 2023 where VAMP will continue to build the Warfighter's bio-armor to protect against biological threats. In addition to nucleic acid vaccines, VAMP will develop alternative vaccine platform technologies and manage awards utilizing go/no-go checkpoints along the development pathway.

The CBIPR-ADM program ensures prioritization to domestic biopharmaceutical manufacturing capacities, capabilities, and infrastructure (e.g. the DoD-ADM Facility and other strategic partners) that are operationally ready to rapidly develop and manufacture medical countermeasures (MCMs) against current and emerging chemical and biological threats including pandemic response. Prioritization is achieved by establishing and enhancing proven biopharmaceutical manufacturing platform technologies and infrastructure at these facilities. Thus, these facilities will have the capability to accelerate development of MCMs at all stages of development, enhance preparedness for existing threats, and rapidly respond to emerging threats as part of a medical integrated layered defense. MCMs that benefit from these

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Chemical and Biological Defense Program **Date:** March 2023

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603884BP / <i>Chemical and Biological Defense Program - Dem/Val</i>	Project (Number/Name) MB4 / <i>Medical Biological Defense (ACD&P)</i>
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efforts include: Vaccines for Viral Agents, Vaccines for Bacterial Agents and Toxins, monoclonal antibodies, antibody fragments and conjugates for therapeutic and prophylactic use across all agent classes. Funds to support prioritization and operational readiness were previously provided via individual product development and manufacturing funding lines. The Department is now providing dedicated funds. The CBIPR-ADM return on investment is an increased level of preparedness and responsiveness. In FY24, the CBIPR-ADM program continues to establish and enhance new manufacturing platform technologies and infrastructure that will enable the development of MCMs against chemical and biological threats.

The MCMPT program streamlines and accelerates delivery of medical countermeasure to the Warfighter against known and emerging biological threats by establishing mature platform technologies that allow for rapid response and by reducing developmental risks. MCMPT is establishing enabling technologies and prepositioning platform systems within the Department of Defense (DoD)'s Advanced Development Manufacturing (ADM) network using standardized discovery, design, manufacturing, and testing processes to reduce the medical countermeasure (MCM) development risks. MCMPT will deliver an enduring capability from which future candidates can be manufactured.

B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2022	FY 2023	FY 2024
Title: 1) COVID TX MAB	10.276	-	-
Description: Rapid Monoclonal Antibody Development			
Title: 2) COVID VAC	9.776	-	-
Description: Validated Nucleic Acid Vaccine Construction Development			
Title: 3) CBIPR-ADM	8.105	-	-
Description: Establish proven enabling manufacturing technologies at the Department of Defense (DoD) ADM Capability Building.			
Title: 4) MCMPT	18.634	-	-
Description: Advanced Development and Manufacturing of Antibody Technology (ADAMANT)			
Accomplishments/Planned Programs Subtotals			
	46.791	-	-

C. Other Program Funding Summary (\$ in Millions)

<u>Line Item</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u> <u>Base</u>	<u>FY 2024</u> <u>OCO</u>	<u>FY 2024</u> <u>Total</u>	<u>FY 2025</u>	<u>FY 2026</u>	<u>FY 2027</u>	<u>FY 2028</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
• EN4: <i>Enabling Investments (ACD&P)</i>	-	6.781	47.272	-	47.272	51.579	9.792	9.840	9.840	Continuing	Continuing
• EN5: <i>Enabling Investments (SDD)</i>	-	13.392	13.835	-	13.835	13.884	14.179	14.197	14.261	Continuing	Continuing

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Chemical and Biological Defense Program **Date:** March 2023

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603884BP / <i>Chemical and Biological Defense Program - Dem/Val</i>	Project (Number/Name) MB4 / <i>Medical Biological Defense (ACD&P)</i>
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C. Other Program Funding Summary (\$ in Millions)

<u>Line Item</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u> <u>Base</u>	<u>FY 2024</u> <u>OCO</u>	<u>FY 2024</u> <u>Total</u>	<u>FY 2025</u>	<u>FY 2026</u>	<u>FY 2027</u>	<u>FY 2028</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
• MB5: <i>Medical Biological Defense (SDD)</i>	138.156	-	-	-	-	-	-	-	-	0.000	138.156
• PT4: <i>Protect (ACD&P)</i>	-	175.219	179.158	-	179.158	135.096	107.341	123.538	139.376	Continuing	Continuing
• UN5: <i>Understand (SDD)</i>	-	126.071	182.726	-	182.726	137.991	127.671	108.908	68.088	Continuing	Continuing
• SA0043: <i>Next Gen Diag 2 Chemical Diagnostics (NGDS 2 CHEM DX)</i>	-	-	1.881	-	1.881	9.579	10.982	11.898	11.861	Continuing	Continuing

Remarks

D. Acquisition Strategy

COVID THERAPIES MONOCLONAL ANTIBODIES (COVID TX MAB)

COVID TX MAB will leverage industry capabilities, in the interest of speed, in order to establish capabilities that can be technology transferred to the DoD ADM for longer term use and scale up as necessary.

COVID VACCINE (COVID VAC)

The COVID VAC program is an investment master list (IML) program that leverages lessons learned from the COVID-19 response to develop vaccines that target biothreats while utilizing a modular approach to ensure flexibility. These prototype vaccines will use a tailored acquisition pathway and will create a strategic reserve to counter the biothreats against the Warfighter.

CHEM BIO INCIDENT PREPAREDNESS AND RESPONSE - (CBIPR-ADM)

By establishing new capabilities at the DoD-ADM Facility and other strategic partners, the CBIPR-ADM line ensures that the DoD will have priority access to critical technologies and infrastructure that are operationally ready to support the rapid development and manufacture of MCMs. This approach ensures that the DoD's efforts are not limited to a single facility. In FY24, the CBIPR-ADM line will continue to establish, enhance, and optimize new manufacturing platform technologies and infrastructure to support the production of MCMs. These new manufacturing technologies can come from any government sources (including the Joint Science & Technology Office for Chemical Biological Defense (JSTO-CBD), the Walter Reed Army Institute of Research (WRAIR), and the Biomedical Advanced Research and Development Authority (BARDA), etc. when mature enough for BA4 funding) and/or other external sources and targets of opportunity from industry.

MCM PLATFORM TECHNOLOGIES (MCMPT)

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Chemical and Biological Defense Program **Date:** March 2023

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The goal of the MCMPT is to rapidly counter a broad-spectrum of threat agents using standardized discovery, design, manufacturing, and testing processes to reduce the MCM development risks. Efforts will focus on transitioning S&T programs from other DoD agencies, such as Defense Threat Reduction Agency (DTRA)-Joint Science and Technology Office (JSTO) or Defense Advanced Research Projects Agency (DARPA), and establishing advanced platform technologies within the Department of Defense (DoD)'s Advanced Development Manufacturing (ADM) network and evaluating that capability through nonclinical and clinical testing. A subset of these technologies, such as the DARPA Pandemic Prevention Platform (P3), will be adapted to deliver a rapid response capability to novel and emerging threats. Once established, future programs will be able to leverage these platforms for the development of future medical countermeasures. It is anticipated that these efforts will leverage the Other Transactions Authority (OTA) through the medical OTA consortium, or Army Contracting Command-Edgewood.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Chemical and Biological Defense Program **Date:** March 2023

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603884BP / Chemical and Biological Defense Program - Dem/Val	Project (Number/Name) MB4 / Medical Biological Defense (ACD&P)
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Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
COVID TX MAB - Accelerated Antibody Development	C/CPFF	Various : N/A	-	9.329	Apr 2022	0.000		0.000		-		0.000	0.000	9.329	0.000
COVID VAC - Vaccine - Development	Various	Various : N/A	-	7.608	Aug 2022	0.000		0.000		-		0.000	0.000	7.608	0.000
COVID VAC - Direct Program Support	Various	Various : N/A	-	1.536	Nov 2022	0.000		0.000		-		0.000	0.000	1.536	0.000
CBIPR-ADM - Enabling Manufacturing Technologies	C/CPFF	Ology : Alachua, FL	13.804	7.756	Mar 2022	0.000		0.000		-		0.000	0.000	21.560	0.000
MCMPT - HW S - ADAMANT PLAGUE MCM Development	C/CPFF	Various : N/A	36.115	17.527	Apr 2022	0.000		0.000		-		0.000	0.000	53.642	0.000
Subtotal			49.919	43.756		0.000		0.000		-		0.000	0.000	93.675	N/A

Management Services (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
COVID TX MAB - Program Management Support	Various	JPL CBRND Enabling Biotechnologies, JPEO-CBRND : Fort Detrick, MD	-	0.947	Dec 2021	0.000		0.000		-		0.000	0.000	0.947	0.000
COVID VAC - PM/MS C - Indirect Management Support	Various	Various : N/A	-	0.632	Nov 2021	0.000		0.000		-		0.000	0.000	0.632	0.000
CBIPR-ADM - Program Management Support	Various	JPL CBRND Enabling Biotechnologies, JPEO-CBRND : Fort Detrick, MD	1.480	0.349	Feb 2022	0.000		0.000		-		0.000	0.000	1.829	0.000

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Chemical and Biological Defense Program		Date: March 2023
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Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
COVID TX MAB - Accelerated Antibody Development	1	2022	4	2022
CBIPR-ADM - MCM Enabling Manufacturing Technologies	1	2022	4	2028
CBIPR-ADM - MCM Development and Manufacturing Support (Infrastructure)	1	2022	4	2028
MCMPT - Rapid Response Design, Manufacturing, Testing	1	2022	4	2028
MCMPT - MCM Optimization Phase Design, Manufacturing, Testing	1	2022	4	2023
MCMPT - Plague Nonclinical Studies	1	2023	2	2024
MCMPT - Plague Clinical Studies	1	2024	2	2024
MCMPT - Plague Manufacturing	1	2022	1	2026
MCMPT - P3/Nucleic Acid	1	2024	4	2026

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Chemical and Biological Defense Program										Date: March 2023		
Appropriation/Budget Activity 0400 / 4					R-1 Program Element (Number/Name) PE 0603884BP / <i>Chemical and Biological Defense Program - Dem/Val</i>				Project (Number/Name) TM4 / <i>Techbase Medical Defense (ACD&P)</i>			
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
TM4: <i>Techbase Medical Defense (ACD&P)</i>	-	29.687	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	29.687
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Project TM4 supports early-phase clinical development of vaccines and therapeutic drugs to provide safe and effective medical defense against validated biological threat agents and emerging infectious disease biothreats including bacteria, toxins, and viruses. This effort reduces programmatic risk of failure in the advanced development phase by generating clinical and supporting non-clinical safety, tolerability and toxicity data for candidate vaccines and therapeutic drugs prior to transition to System Development & Demonstration. After FY 2022, the Chemical Biological Defense Program (CBDP) RDT&E Projects were restructured to align with the CBDP portfolio construct. TM4 efforts in FY 2022 progress to Projects MT4 and PT4. This restructuring provides standardization and alignment across CBDP research, development and acquisition efforts.

Individual efforts in this project include:

- (1) Tech Base Medical - Transitional Medical Technology Initiative (TBMD TMTI), and
- (2) Tech Base Medical Defense - Chem CM (TBMDC CHEM CM)

- Supports the advanced development of medical countermeasures to include prophylaxes, pretreatments, antidotes and therapeutic drugs against identified and emerging biological warfare threat agents.
- Demonstration of human safety and tolerability prior to entry of candidate vaccines and therapeutics into advanced development, supporting the preparation of technical data packages that conform to the Food and Drug Administration (FDA) Investigational New Drug (IND) processes, Department of Defense (DoD) acquisition regulations, and the oversight of early phase clinical trials in accordance with FDA guidelines.
- In addition, this project supports innovative biotechnology approaches to advance medical systems designed to rapidly identify, diagnose, prevent, and treat emerging biological threats whether naturally occurring or engineered.
- Focuses on therapeutic and prophylactic strategies to effectively minimize injuries resulting from exposure to Chemical Weapons Agents. This effort involves the evaluation FDA approved therapeutics for operational use, as well as generation of novel drug products and formulations to enhance level of protection and/or operational utility for the Warfighter. Efforts in this area are designed to develop drug candidates that will ultimately be submitted for FDA licensure or to identify previously licensed products for new uses in the treatment and pretreatment against chemical warfare injury.

B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2022	FY 2023	FY 2024
Title: 1) TBMD TMTI - DOMANE/LIMIT (Layered Integrated Medical Countermeasure Intervention Technologies)	9.000	-	-

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Chemical and Biological Defense Program		Date: March 2023
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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2022	FY 2023	FY 2024
<p>Description: Initiated platform biotechnologies, capabilities, processes and candidate medical countermeasures (MCMs). Investments will develop a rapid drug discovery and development engine to enable the joint force to rapidly respond to new & emerging Biological Warfare (BW) threats by providing BW MCMs. Immediate alignment with Biological Prophylaxis and Therapeutics Programs to respond and treat the Joint Force against BW threats.</p>			
<p>Title: 2) TBMD TMTI - Biological Warfare Defense Therapeutics</p> <p>Description: Biological Warfare (BW) defense therapeutics mitigate and reverse the effects of known and emerging viral, bacterial, and toxin biological warfare threats in symptomatic warfighters diagnosed with BW disease. Biomedical research is focused on nonclinical and early clinical development of therapeutic countermeasures against known and emerging viral, bacterial, and toxin BW threats for which Food and Drug Administration (FDA)-approved therapeutics are limited or lacking. Broad-spectrum therapeutic candidates that are shown to be both safe and efficacious against BW threats will advance for further clinical evaluation and can be accelerated for use against emerging infectious diseases during an outbreak. Refinement of appropriate animal models in which to evaluate therapeutic candidates is also included. Projects leverage interagency and commercial sector investments to accelerate development and reduce costs.</p>	7.239	-	-
<p>Title: 3) TBMD TMTI - Bacterial/Viral/Toxin/Broad Spectrum Prophylaxis</p> <p>Description: The ultimate protection of the Warfighter is by pretreating the Warfighter to withstand any biological threat with no adverse side effects from the pretreatment. Such pretreatment would enable the Warfighter to work in a less restrictive environment, absent of any personal protective equipment allowing operation at peak performance. Investments in this Program Element supports GMP manufacturing of candidates for clinical testing, toxicology studies necessary for entry into Phase 1 clinical trials and Phase 1 clinical trials just prior to transition to advanced development.</p>	7.238	-	-
<p>Title: 4) TBMD CHEM CM - PBA Medical Countermeasures</p> <p>Description: Focuses on therapeutic and prophylactic strategies to effectively minimize injuries and/or death resulting from exposure to Pharmaceutical Based Agents (PBA). This will allow the Warfighter to maintain operational capacity in a chemically contested battlefield scenario. This effort involves the evaluation FDA approved therapeutics for operational use, as well as generation of novel drug products and formulations to enhance level of protection and/or operational utility for the Warfighter. Efforts in this area are designed to develop drug candidates that will ultimately be submitted for Food and Drug Administration (FDA) licensure or to identify previously licensed products for new uses in the treatment and pretreatment against chemical warfare injury.</p>	1.710	-	-
Accomplishments/Planned Programs Subtotals	25.187	-	-

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Chemical and Biological Defense Program		Date: March 2023
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603884BP / <i>Chemical and Biological Defense Program - Dem/Val</i>	Project (Number/Name) TM4 / <i>Techbase Medical Defense (ACD&P)</i>

	FY 2022	FY 2023
Congressional Add: Development of medical countermeasures against novel entities (DOMANE)	4.500	-
FY 2022 Accomplishments: Deliver platform biotechnologies, capabilities, processes and candidate medical countermeasures (MCMs). Investments will develop a rapid drug discovery and development engine to enable the joint force to rapidly respond to new & emerging BW threats by providing biological warfare (BW) MCMs. Immediate alignment with Biological Prophylaxis and Therapeutics Programs to respond and treat the Joint Force against BW threats. - Enhance high-throughput screening technologies and advanced artificial intelligence/machine learning tools for rapid target and drug identification, with an emphasis on repurposing Food and Drug Administration approved drugs. In cases where no existing drug solution can be identified, new drugs will be identified to fill gaps in the Nations approved drug inventory. - Additional investments will be made in microphysiological organ-on-a-chip pathogenesis forecasting systems to address mechanisms of action, safety, efficacy to enhance drug development platforms.		
Congressional Adds Subtotals	4.500	-

C. Other Program Funding Summary (\$ in Millions)

Line Item	FY 2022	FY 2023	FY 2024	FY 2024	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028	Cost To	
			Base	OCO	Total					Complete	Total Cost
• MT4: <i>Mitigate (ACD&P)</i>	-	17.302	28.785	-	28.785	20.885	15.433	13.369	-	Continuing	Continuing
• PT4: <i>Protect (ACD&P)</i>	-	175.219	179.158	-	179.158	135.096	107.341	123.538	139.376	Continuing	Continuing
• TM2: <i>Techbase Medical Defense (Applied Research)</i>	107.608	-	-	-	-	-	-	-	-	0.000	107.608

Remarks

D. Acquisition Strategy

TECH BASE MEDICAL TRANSITIONAL MED TECHNOLOGY INTIATIVE (TBMD TMTI)

Supports early-phase clinical development and supporting non-clinical safety, tolerability and toxicity data for candidate vaccines and therapeutic drugs prior to transition to System Development & Demonstration. This work provides safe and effective medical defense against validated biological threat agents and emerging infectious disease biothreats including bacteria, toxins, and viruses. This work also involves the evaluation of Food and Drug Administration (FDA)-approved therapeutics for operational use, as well as generation of novel drug products and formulations, to enhance level of protection and/or operational utility for the Warfighter. This effort reduces programmatic risk of failure in the advanced development phase.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Chemical and Biological Defense Program **Date:** March 2023

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603884BP / Chemical and Biological Defense Program - Dem/Val	Project (Number/Name) TM4 / Techbase Medical Defense (ACD&P)
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Test and Evaluation (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
TBMD TMTI - DTE C - Viral Prophylaxis	C/CPFF	Advanced Technologies International : Summerville, SC	-	7.239	Oct 2021	0.000		0.000		-		0.000	0.000	7.239	0.000
TBMD TMTI - DTE C - DOMANE/LIMIT (Layered Integrated Medical Countermeasure Intervention Technologies)	C/CPFF	Advanced Technologies International : Summerville, SC	-	9.000	Oct 2021	0.000		0.000		-		0.000	0.000	9.000	0.000
TBMD TMTI - DTE C - Bacterial Therapeutics	C/CPFF	Advanced Technologies International : Summerville, SC	-	7.238	Oct 2021	0.000		0.000		-		0.000	0.000	7.238	0.000
TBMDC CHEM CM - DTE C - PBA Medical Countermeasures	MIPR	TBD : N/A	-	1.710	Oct 2021	0.000		0.000		-		0.000	0.000	1.710	0.000
CONG - DTE C - DOMANE	C/CPFF	Advanced Technologies International : Summerville, SC	-	4.500	Oct 2022	0.000		0.000		-		0.000	0.000	4.500	0.000
Subtotal			-	29.687		0.000		0.000		-		0.000	0.000	29.687	N/A

	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals		-	29.687	0.000	0.000	0.000	0.000	29.687	N/A

Remarks

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Exhibit R-4, RDT&E Schedule Profile: PB 2024 Chemical and Biological Defense Program		Date: March 2023
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FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027				FY 2028			
1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4

TBMD TMTI - Biological Therapeutics	[REDACTED]																											
TBMD TMTI - DOMANE/LIMIT (Layered Integrated Medical Countermeasure Intervention Technologies)	[REDACTED]																											
TBMD TMTI - Viral Prophylaxis	[REDACTED]																											
TBMD TMTI - Biological Warfare Defense Therapeutics	[REDACTED]																											

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Chemical and Biological Defense Program		Date: March 2023
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Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
TBMD TMTI - Biological Therapeutics	1	2023	4	2027
TBMD TMTI - DOMANE/LIMIT (Layered Integrated Medical Countermeasure Intervention Technologies)	1	2023	4	2026
TBMD TMTI - Viral Prophylaxis	1	2023	4	2027
TBMD TMTI - Biological Warfare Defense Therapeutics	1	2024	4	2027

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Chemical and Biological Defense Program										Date: March 2023		
Appropriation/Budget Activity 0400 / 4					R-1 Program Element (Number/Name) PE 0603884BP / Chemical and Biological Defense Program - Dem/Val				Project (Number/Name) TT4 / Technology Transition (ACD&P)			
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
TT4: Technology Transition (ACD&P)	-	0.740	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.740
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Project TT4 validates technologies and their respective concepts-of-operations in preparation for transition to advanced development programs requiring chemical and biological (CB) defense technologies. These demonstrations seek to demonstrate the potential for enhanced military operational capability and/or cost effectiveness while soliciting end-user determination of the military utility and operational impact of the technology and capability demonstrated. Successfully demonstrated technologies with proven military utility can either be left in place for extended user evaluations, accepted into advanced stages of the formal acquisition process, proceed directly into limited or full-scale production or be returned to the technical base for further development.

B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2022	FY 2023	FY 2024
Title: 1) TECHTRAN - Advanced Technology Demonstration	0.740	-	-
Description: ATDs enable the effective transition of cutting edge Chemical Biological Radiological and Nuclear (CBRN) Science & Technology (S&T) Technologies to the Warfighter by providing them an opportunity to engage with these new technologies in a mission oriented demonstration. Feedback from the Warfighters ensures that these technologies are operationally relevant, value added, and can be matured and transitioned in a timely and effective manner to end users for employment.			
Accomplishments/Planned Programs Subtotals	0.740	-	-

C. Other Program Funding Summary (\$ in Millions)

Line Item	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
• TT3: Technology Transition (ATD)	7.589	-	-	-	-	-	-	-	-	0.000	7.589

Remarks

D. Acquisition Strategy

TECHBASE TECH TRANSITION (TECHTRAN)

Advanced Technology Demonstrations (ATDs) exploit mature and maturing technologies to solve important military problems. ATDs emphasize technology integration, operational utility assessment, and transition of operational prototypes for practical use. The goals of efforts under Project TT4 are to provide a prototype capability to the Warfighter and support the evaluation of that capability in operationally-relevant field environments. This will allow Warfighters to evaluate the capabilities in

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Chemical and Biological Defense Program **Date:** March 2023

Appropriation/Budget Activity	R-1 Program Element (Number/Name)	Project (Number/Name)
0400 / 4	PE 0603884BP / <i>Chemical and Biological Defense Program - Dem/Val</i>	TT4 / <i>Technology Transition (ACD&P)</i>

real military exercises and at a scale sufficient to fully assess military utility. The Defense Threat Reduction Agency (DTRA) will fund Department of Defense (DoD) laboratories and DoD Federally Funded Research Development Centers (FFRDCs) through the Military Interdepartmental Purchase Request (MIPR) in accordance with the Economy Act in order to conduct operational evaluation of technology solutions for Integrated Early Warning (IEW) and Integrated Layered Defense (ILD) ATD efforts. Upon completion of efforts under this project, operational prototypes of Technology Readiness Level (TRL) 6 or TRL 7 with documented operational utility assessment outcomes will be transitioned to Service stakeholders and programs of record to support rapid acquisition and fielding decisions.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Chemical and Biological Defense Program **Date:** March 2023

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603884BP / Chemical and Biological Defense Program - Dem/Val	Project (Number/Name) TT4 / Technology Transition (ACD&P)
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Support (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
TECHTRAN - IEW and ILD Transition	MIPR	U.S. Army Combat Capabilities Development Command (DEVCOM) Chemical Biological Center (CBC) : Aberdeen Proving Ground, MD	0.232	0.174	Jan 2022	0.000		0.000		-		0.000	0.000	0.406	0.000
Subtotal			0.232	0.174		0.000		0.000		-		0.000	0.000	0.406	N/A

Test and Evaluation (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
TECHTRAN - IEW and ILD Transition	MIPR	U.S. Army Combat Capabilities Development Command (DEVCOM) Chemical Biological Center (CBC) : Aberdeen Proving Ground, MD	0.823	0.491	Jan 2022	0.000		0.000		-		0.000	0.000	1.314	0.000
Subtotal			0.823	0.491		0.000		0.000		-		0.000	0.000	1.314	N/A

Management Services (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
TECHTRAN - PM/MS S - IEW and ILD Transition	MIPR	U.S. Army Combat Capabilities Development Command (DEVCOM) Chemical Biological Center	0.050	0.075	Jan 2022	0.000		0.000		-		0.000	0.000	0.125	0.000

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Exhibit R-4, RDT&E Schedule Profile: PB 2024 Chemical and Biological Defense Program		Date: March 2023
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603884BP / <i>Chemical and Biological Defense Program - Dem/Val</i>	Project (Number/Name) TT4 / <i>Technology Transition (ACD&P)</i>

FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027				FY 2028			
1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4

TECHTRAN - TECHTRAN - ITR ATD	[REDACTED]																											
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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Chemical and Biological Defense Program		Date: March 2023
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603884BP / <i>Chemical and Biological Defense Program - Dem/Val</i>	Project (Number/Name) TT4 / <i>Technology Transition (ACD&P)</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
TECHTRAN - TECHTRAN - ITR ATD	1	2022	1	2024

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Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Chemical and Biological Defense Program **Date:** March 2023

Appropriation/Budget Activity 0400: <i>Research, Development, Test & Evaluation, Defense-Wide / BA 5: System Development & Demonstration (SDD)</i>	R-1 Program Element (Number/Name) PE 0604384BP / <i>Chemical and Biological Defense Program - EMD</i>
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COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
Total Program Element	0.000	291.122	301.611	382.977	0.000	382.977	314.012	299.540	263.749	243.375	Continuing	Continuing
UN5: <i>Understand (SDD)</i>	-	0.000	126.071	182.726	0.000	182.726	137.991	127.671	108.908	68.088	Continuing	Continuing
PT5: <i>Protect (SDD)</i>	-	0.000	87.923	97.975	0.000	97.975	69.858	66.259	52.871	67.776	Continuing	Continuing
MT5: <i>Mitigate (SDD)</i>	-	0.000	74.225	88.441	0.000	88.441	92.279	91.431	87.773	93.250	Continuing	Continuing
EN5: <i>Enabling Investments (SDD)</i>	-	0.000	13.392	13.835	0.000	13.835	13.884	14.179	14.197	14.261	Continuing	Continuing
CA5: <i>Contamination Avoidance (SDD)</i>	-	84.967	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	84.967
CO5: <i>Collective Protection (SDD)</i>	-	2.888	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.888
DE5: <i>Decontamination (SDD)</i>	-	7.485	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	7.485
IP5: <i>Individual Protection (SDD)</i>	-	18.690	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	18.690
MB5: <i>Medical Biological Defense (SDD)</i>	-	138.156	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	138.156
MC5: <i>Medical Chemical Defense (SDD)</i>	-	38.936	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	38.936

A. Mission Description and Budget Item Justification

This program element (PE) resources System Development & Demonstration across the Understand, Protect, Mitigate, and Enabling Investments portfolios. The Chemical Biological Defense Programs (CBDP) investments provide an integrated, layered capability to enable Countering Weapons of Mass Destruction (CWMD) missions ranging from combat operations to Department of Defense (DoD) support to domestic incident prevention and response. The projects in this PE support the development, build, and test of products to verify that all operational and derived requirements have been met and to support production or deployment decisions. The activities include mature system development, integration, and demonstration to support Milestone C decisions, and conducting operational tests and evaluation of production representative articles. FY24 funding accelerates characterization and situational awareness of emerging biothreats and accelerates delivery of improved protection from and mitigation of biothreats, including rapid repurposing of available therapeutics and development of new vaccines.

Individual Projects include:

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Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Chemical and Biological Defense Program Date: March 2023

Appropriation/Budget Activity 0400: Research, Development, Test & Evaluation, Defense-Wide I BA 5: System Development & Demonstration (SDD)	R-1 Program Element (Number/Name) PE 0604384BP I Chemical and Biological Defense Program - EMD
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- Understand (UN5): Provides the Joint Force the ability to detect and identify hazards from traditional and emerging chemical and biological threats to improve the timeliness and confidence of information for decision-makers. Supports freedom of maneuver and informs commanders' decisions by predicting, locating, identifying, analyzing, and warning of chemical and biological (CB) hazards.
- Protect (PT5): Provides the Joint Force the ability to prevent the effects of exposure to chemical and biological hazards. Protects personnel against chemical, biological, and radiological (CBR) liquid, vapor, and aerosol hazards through next-generation prototypes of masks, filters, and ensembles to reduce physiological, psychological, and logistical burdens to the Warfighter. Medical countermeasure efforts conducted during this phase include the development of a large-scale manufacturing process and validation of that process, nonclinical studies, demonstration of manufacturing consistency, and expanded clinical human safety studies. Focuses on platform-based approaches to accelerate the development of prophylactic medical countermeasures that rapidly and durably protect against Biological Warfare Agents (BWAs), toxins, non-traditional and emerging chemical threats with minimal doses. The results of these efforts will be used to submit a Biologics License Application (BLA) to the U.S. Food & Drug Administration (FDA) for product licensure.
- Mitigate (MT5): Preserves combat power by mitigating exposure to CB hazards and restoring combat readiness of critical personnel and platforms. Enables Joint Force lethality by providing capabilities for Warfighters to rapidly respond to and mitigate the adverse effects of CB hazards. Fields mitigation capabilities against engineered biological agents, opioids and other Pharmaceutical-Based Agents, and Fourth Generation Agents (FGAs).
- Enabling Investments (EN5): Provides fundamental knowledge and technology demonstrations as key portfolio enablers integral to responding to emerging threats. Dedicated funding for this Project supports National and Departmental incident response and preparedness regarding CB threats.
- Contamination Avoidance (CA5), Collective Protection (CO5), Decontamination (DE5), Individual Protection (IP5), Medical Biological Defense (MB5) and Medical Chemical Defense (MC5) are no longer active FY24 Projects due to budget restructuring.

Middle Tier Acquisition programs:

The total cost of the Rapid Opioid Countermeasure System (ROCS) Middle Tier of Acquisition effort is \$12.974 million, including RDT&E (Project MC5) and procurement of prototype units (CBDP BLIN Protection & Hazard Mitigation). The ROCS is fully funded across the Future Years Defense Program.

The total cost of the Forward Area Mobility Spray System (FAMS-S) Middle Tier of Acquisition effort is \$34.141 million, including RDT&E (Projects DE5 and MT5) and procurement of prototype units (CBDP BLIN Protection & Hazard Mitigation). The FAMS-S program is fully funded across the Future Years Defense Program.

The total cost of the Uniform Integrated Protective Ensemble Family of Systems Gloves (UIPE FOS GLOVES) Middle Tier of Acquisition effort is \$49.483 million, including RDT&E (Projects IP4 and PT5) and procurement of prototype units (CBDP BLIN Protection & Hazard Mitigation). The UIPE FOS GLOVES program is fully funded across the Future Years Defense Program.

The projects in this PE support the engineering and manufacturing development phase of the Department of Defense (DoD) acquisition system and are, therefore, correctly placed in Budget Activity 5.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Chemical and Biological Defense Program **Date:** March 2023

Appropriation/Budget Activity 0400: <i>Research, Development, Test & Evaluation, Defense-Wide I BA 5: System Development & Demonstration (SDD)</i>	R-1 Program Element (Number/Name) PE 0604384BP / <i>Chemical and Biological Defense Program - EMD</i>
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B. Program Change Summary (\$ in Millions)	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Previous President's Budget	299.848	312.148	276.205	-	276.205
Current President's Budget	291.122	301.611	382.977	-	382.977
Total Adjustments	-8.726	-10.537	106.772	-	106.772
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-10.537			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-2.237	-			
• SBIR/STTR Transfer	-6.488	-			
• Other Adjustments	-0.001	-	106.772	-	106.772

Change Summary Explanation

Funding: FY 2022 (-\$2.237 Million): Below threshold reprogramming to Advanced Component Development & Prototypes, Budget Activity 4 for Advanced Emerging Threat Defense efforts, and reprogrammed prior year execution balances to RDT&E Management Support, Budget Activity 6 in support of the Departments higher priorities.

FY 2022 (-\$6.488 Million): Transfer of funding to support Small Business Innovative Research/Small Business Technology Transfer efforts.

FY 2023 (-\$10.537 Million): Congressional Directed Reductions.

FY 2024 (+\$106.772 Million): Increase provides for biological defense improvement efforts, Next Generation Diagnostic System Increment 2 Man Portable Diagnostic System continued development and testing, Alternate Autoinjector Manufacturer Capability design development and prototype evaluations, complete engineering and manufacturing development (EMD) activities for the Multi-Phase Chemical Agent Detector, Aerosol Vapor Chemical Agent Detector activities in support of a Full Rate Production decision, Botulinum Monoclonal Antibodies manufacturing and clinical studies, initiating efforts within the Understand, Protect and Mitigate portfolios, and Departmental inflation rate adjustments (+\$1.687 Million).

Schedule: N/A

Technical: Provides for critical new start programs Advanced System for Protection and Integrated Reduction of Encumbrances - Enhanced Biodefense (ASPIRE-ENBD), Collective Protection CONEX Enhanced Biodefense (COL PRO CONEX-ENBD), Portable Patient Transport System-Enhanced Biodefense (PPTS-ENBD), and Shipboard Isolation System (SIS).

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Chemical and Biological Defense Program **Date:** March 2023

Appropriation/Budget Activity 0400 / 5	R-1 Program Element (Number/Name) PE 0604384BP / <i>Chemical and Biological Defense Program - EMD</i>	Project (Number/Name) UN5 / <i>Understand (SDD)</i>
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COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
UN5: <i>Understand (SDD)</i>	-	0.000	126.071	182.726	0.000	182.726	137.991	127.671	108.908	68.088	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Understand System Development & Demonstration (SDD) Project provides the Joint Force the ability to continually receive information about the Chemical, Biological, Radiological and Nuclear (CBRN) situation at a desired time and place by detecting, identifying, and quantifying CBRN hazards in air, water, or on land, and on personnel, equipment or facilities. These efforts support the ability to conduct early warning (informing protective posture) and employment of rapid detection, identification, and analysis tools needed to address emerging biological threats. Efforts also keep the Joint Force ahead of emerging chemical threats with portable, reduced size, weight, and power, cost detectors to protect general and specialized forces and to enhance operations on the battlefield by providing early warning and field analytics. Medical diagnostic activities develop U.S. Food & Drug Administration (FDA) approved products for the warfighter at the point of care to inform far-forward medical and protection decisions. In FY 2023, the Chemical Biological Defense Program (CBDP) RDT&E Projects were restructured to align with the CBDP portfolio construct. UN5 efforts in FY 2022 remain in Project CA5, IP5, and MB5. This restructuring provided standardization and alignment across CBDP research, development and acquisition efforts.

Efforts included in this Project are:

- (1) Advanced Emerging Threat Defense (AET DEFENSE)
- (2) Aerosol & Vapor Chemical Agent Detector (AVCAD)
- (3) Chemical and Biological Wearables - Enhanced Biodefense (CB Wearables - ENBD)
- (4) Chemical Biological Radiological and Nuclear (CBRN) Sensor Integration on Robotics Platforms (CSIRP)
- (5) Compact Vapor Chemical Agent Detector (CVCAD)
- (6) Defense Biological Products Assurance Program (DBPAP)
- (7) Defense Biological Products Assurance Program-Enhanced Biodefense (DBPAP-ENBD)
- (8) Far Forward Biological Sequencing (FFBS)
- (9) Wearable All Hazard Remote Monitoring Program (WARP)
- (10) Joint Biological Tactical Detection System (JBTDS)
- (11) Mobile Field Kit (MFK)
- (12) Multi-Phase Chemical Agent Detector (MPCAD)
- (13) Nuclear Biological Chemical Reconnaissance Vehicle Sensor Suite Upgrade (NBCRV SSU)
- (14) Next Generation Diagnostic System Increment 2 Chemical Diagnostic (NGDS 2 CHEMDX)
- (15) NGDS 2 Man Portable Diagnostic System (NGDS 2 MPDS)
- (16) Surveillance and Pathogen Characterization - Enhanced Biodefense (SPCHAR-ENBD)
- (17) Special Purpose Unit Rapid Capability Development and Deployment (SPU RCDD)

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Chemical and Biological Defense Program		Date: March 2023
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The Advanced Emerging Threat Defense (AET DEFENSE) program continues to address the highest priority CBRN gaps and supports the Chemical Biological Defense Program (CBDP) Strategic Line of Effort to meet current and emerging threats by anticipating CB hazards and developing capabilities to counter emerging and future threats. The AET DEFENSE program collaborates with the Joint Services, interagency, and international partners to align RDT&E resources to determine readiness against emerging threats, to include Non-Traditional Agents (NTAs), such as Novichoks and Pharmaceutical-Based Agents (PBA) (e.g. synthetic opioids), emerging biological threats, toxins, and other advanced and emerging threats as they are identified across the entire CBDP enterprise portfolio. In FY24, AET DEFENSE continues to broaden data set for emerging biological threats and PBAs to better assess detection and decontamination capabilities.

AVCAD is a man portable system to detect aerosol and vapor chemical agents. AVCAD fills critical gaps in current Joint Force chemical sensor capabilities, in the areas of liquid, solid and dusty aerosol Chemical Warfare Agent detection, and detection of specific advanced threats/Non-Traditional Agents. The AVCAD will also detect low-level off-gassing, or residual vapors, to prevent/mitigate health effects associated with low concentration exposures, and perform remote alarm warning and reporting. AVCAD will support chemical and biological defense missions, including monitoring, collective protection, base defense, decontamination, unmasking, and reconnaissance. AVCAD will be integrated on the Nuclear Biological Chemical Reconnaissance Vehicle (NBCRV) Stryker. AVCAD also has a fixed site variant that will be integrated onto ships. In FY24, AVCAD will execute and complete production and deployment testing.

CB Wearables-ENBD will continue to develop an integrated physiological monitoring capability that leverages artificial intelligence and machine learning (AI/ML) analytics to detect and alert anomalies that may indicate exposure to biological warfare agents (BWA) or other emerging threats. This will enable the Services to conduct force-wide monitoring to detect the presence or initial onset of CBRN threats and human physiological stressors before an operator's mission performance degrades, a communicable disease spreads, or an individual becomes a casualty. This provides the Government the ability to understand, address and provide solutions against emerging threats encountered under many operational scenarios, which could deter maneuver and ability to project force. CB Wearables-ENBD will continue to directly interface and integrate with existing Joint Force computing environments and directly supports the strategic goals of the CBDP's Enhanced Biodefense effort.

CSIRP is a prototyping and fielding effort that will focus on repackaging and integrating of modular CBRN sensor and common interface solutions to enhance Unmanned Aircraft Systems (UAS), Unmanned Surface Vessels (USV) and Unmanned Ground Vehicles (UGV) to provide situational awareness across the echelons of command in order to enable freedom of maneuver and action on the battlefield. An integrated CSIRP capability will exploit advances in artificial intelligence, machine learning and autonomy, sensing and communication capabilities that enable timely and accurate detection, warning and reporting of CBRN hazards. This reduces risk at tactical and operational echelons in mounted and dismounted configurations. CSIRP gives the Joint Force an opportunity to enhance capabilities and maintain operational advantage in a lethal and sophisticated operating environment. In FY24, CSIRP will integrate standoff detection and provide upgrades to CBRN autonomy, mapping and obstacle avoidance for denied global positioning system (GPS) operations on UASs.

The Compact Vapor Chemical Agent Detector (CVCAD) is designed to be an unobtrusive, low-profile chemical detection capability that will continuously, and autonomously, monitor and alert general and specialized units to an unsafe environment without further burdening the warfighters payload or interfering with the primary mission. The small form factor (less than 2 lbs.) is amenable to both man-worn and unmanned aerial or ground system operations to enable timely personnel protective

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Chemical and Biological Defense Program	Date: March 2023
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Appropriation/Budget Activity 0400 / 5	R-1 Program Element (Number/Name) PE 0604384BP / <i>Chemical and Biological Defense Program - EMD</i>	Project (Number/Name) UN5 / <i>Understand (SDD)</i>
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action and other force protection decisions. FY24 funding conducts engineering manufacturing and development of systems after Milestone B decision and provides program management support.

The Defense Biological Product Assurance Program (DBPAP) serves as the principal resource of high quality, validated, and standardized biological detection assays and reagents that meet the requirements of the warfighter and Joint biological defense systems. DBPAP pursues an array of analytical tools to verify assay performance and predict effective medical countermeasure solutions that are critical to preparedness. The DBPAP enables an Ordering System for Critical Assays and Reagents (OSCAR), where multiple government agencies and customers can place orders, track order status, and monitor ordering history. In FY24 DBPAP will continue to support optimization and expansion of biological threat agents reference materials and assays to known and emerging threats.

The Defense Biological Product Assurance Program - Enhanced Biodefense (DBPAP-ENBD) efforts increase the capabilities above DBPAP baseline levels specifically through enhancements to biological threat agent reference materials, analytical tools portfolios, increased sequencing capabilities, expanded analytical tool capabilities, increased repository of collected biothreat genomic information, and additional biorepository of targeted biothreats and toxins against emerging diseases and potential pandemics. In FY24 DBPAP-ENBD continues to support expanded enhancements to biological threat agent reference materials, and analytical tools portfolios, increased sequencing capabilities, expanding on analytical tools, additional repository of collected biothreat genomic information, and increased biorepository of targeted biothreats and toxins against emerging diseases and potential pandemics.

Far Forward Biological Sequencing (FFBS) system is a rapid handheld biological sequencing device that will identify an unlimited number of Biological Warfare Agents (BWAs) to include emerging or engineered biological weapon threats on or near the objective. It will provide far-forward Special Operations Forces (SOF) and Special Operations Task Forces (SOTFs) the detect-to-inform capability with a reduction in timeline from weeks to hours, increasing tactical flexibility and fighting strength, and it will save lives. The system includes sampling equipment, consumables, a sequencing device, and a back-end bioinformatics library with an intuitive front-facing user interface. When used together, this system will allow for the identification and documentation of emerging or engineered BWAs with the ability to reach back to biological warfare experts with detailed sequencing information. This system will provide near-real time identification of BWAs, to decrease the tactical decision timeline from weeks to hours, significantly increasing the situational awareness of biological threats to SOF forces operating in a far-forward environment and enabling Commanders' real-time tactical decision-making. FY24 funds will focus on the development of prototypes to ensure they meet the requirements of the Capabilities Development Document.

Wearable All-hazard Remote-monitoring Project (WARP) is a family of wearable and attachable sensors to collect, transmit, and integrate information about the operational environment, disposition of warfighters, and equipment status in order to optimize actions on the objective and facilitate reconstruction of the force post-mission. This network of sensors may be accessed by multiple echelons to maximize operational decisions and will result in increased force protection within the assault force and more timely and accurate situational awareness.

JBTDS is the first tactical lightweight, low-cost biological surveillance system to detect, collect, and identify Biological Warfare Agent (BWA) aerosols. JBTDS components are man-portable, battery operable and easy to employ by any military user. JBTDS provides notification of a hazard and enhances battle-space awareness to protect and preserve the forces and can archive a sample for follow up analysis. When networked, JBTDS augments existing biological detection systems providing a theater-wide array capable of biological detection, identification and warning to support time sensitive force protection decisions. The JBTDS provides

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Chemical and Biological Defense Program	Date: March 2023
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Appropriation/Budget Activity 0400 / 5	R-1 Program Element (Number/Name) PE 0604384BP / <i>Chemical and Biological Defense Program - EMD</i>	Project (Number/Name) UN5 / <i>Understand (SDD)</i>
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surface sampling capability which interfaces with the JBTDS identifier to support sensitive site exploitation missions. In FY24, JBTDS will continue activities required to support the low rate initial production (LRIP).

MFK effort is the modernization, development, and continuous engineering of Mobile Field Kit (MFK), which is the National Guard Bureau's (NGBs) interim CBRN Awareness & Understanding capability for the Homeland Defense Mission. MFK is a suite of software applications, platforms, and architecture residing on the National Guard CBRN Response Enterprise (CRE) Information Management System (NG-CIMS) operationally deployed in support of Title 32 missions. MFK provides the NGB real-time visualization and mapping of CBRN threats, personnel location and health, and other sensor data to support the Homeland mission. FY24 funds will begin the modernization, development and continuous engineering required to integrate MFK into the Joint architecture, while maintaining the operational relevancy of the current capability.

MPCAD is a two-man portable system that will conduct near real-time, near-laboratory grade analysis of solid, liquid, and vapor samples collected by the operator in a presumptively contaminated area. The MPCAD results will support the Commander's tactical and operational decisions regarding maneuver, protection, decontamination, and treatment measures. The Army and Marine Corps will employ MPCAD in Dismounted Reconnaissance and Site Assessment missions to substantiate presumptive detector results. The Air Force will employ the MPCAD to support Post-Event Reconnaissance in support of Reconnaissance and Surveillance missions by monitoring the environment at airbases after a chemical release. The Air Force will continuously monitor contaminated areas for chronic health effects levels through analysis of samples from collectors deployed at the contamination site and brought back to the analyzer for identification and quantification. This information will support commander decisions to determine Mission Oriented Protective Posture (MOPP) levels and eventual termination of cordon restrictions. In FY24, MPCAD will complete the vapor LRIP testing and plan to conduct the Full Rate Production Decision in late FY24.

Nuclear Biological Chemical Reconnaissance Vehicle Sensor Suite Upgrade (NBCRV SSU) provides maneuver formations the ability to conduct mounted Chemical Biological Radiological and Nuclear (CBRN) reconnaissance and surveillance. The NBCRV SSU will answer the commander's priority intelligence requirements & facilitate proactive risk-based decisions, to ensure freedom of action and maintain maneuver momentum in Large Scale Combat Operations. NBCRV SSU is an Acquisition Category (ACAT) II modification work order (MWO) effort to modernize the current NBCRV Sensor Suite to increase maintainability, reliability, maneuverability of the force, and standoff distance from the threat, via enhanced CBRN standoff capabilities & integrating onto robotics for manned unmanned teaming.

NGDS 2 ChemDx program will provide a rapid, hand-held, point-of-care device, for the detection of acetyl cholinesterase (AChE) levels in blood samples, an indicator of possible Nerve Agent exposure in individuals. NGDS 2 ChemDx will be employed by the Army, Air Force, Navy, Marines and SOCOM at multiple echelons of healthcare. NGDS 2 ChemDx test results are to be used to aid in the diagnosis and treatment of individuals suspected of having exposure to chemical nerve agents. In FY24, NGDS 2 ChemDx continues Engineering & Manufacturing Development, including Development Testing (DT) and Operational User Evaluations, and initiation of clinical trials.

The NGDS 2 MPDS program will provide a simple-to-use, portable diagnostic device capability that can be used in austere battlefield environments to assist in the diagnosis of infectious diseases and biological warfare agents. The MPDS will enable earlier patient diagnosis, improve decision support for treatment, evacuation and command situational awareness, and; mitigate the effects of exposure to unknown infectious disease and biological agents. In FY24, NGDS 2 MPDS concludes hardware, software and assay design, including planning for Initial Operational Test and Evaluation (IOT&E) and completion of clinical trials.

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Chemical and Biological Defense Program		Date: March 2023
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SPCHAR-ENBD (contact tracing) integrates innovative and emerging contact tracing capabilities into the pre-symptomatic exposure wearable system outlined in CB Wearables-ENBD. This effort will leverage on-going COVID-19 investments in contact tracing stemming from the joint service response to Joint Emergent Operational Needs Statement (JEONS) JS-0003. It will include person-worn digital proximity tools for logging close contacts with the infected. SPCHAR-ENBD directly supports the strategic goals of the Chemical Biological Defense Program's (CBDP's) Enhanced Biodefense effort.

SPU RCDD facilitates Joint Special Operations Command (JSOC) rapid response requirements to near-term and emergent chemical-biological defensive capabilities. This includes select elements from across the Special Operations Force (SOF) Enterprise such as CBRN Assessment Response Teams (CARTs) and other Joint Force enabling units such as the 20th Chemical, Biological, Radiological, Nuclear and Explosives Command. SPU RCDD mitigates risk across the Chemical Biological Defense Program (CBDP) by creating a portfolio of operationally-relevant CB capabilities that can be quickly transitioned in response to the articulated, emergent capability needs of the geographic combatant commanders. These objectives are met by the early transitioning of promising science and technologies (S&T); the focused conduct of combat evaluations and mission-oriented operational assessments to assess technological and mission suitability; and the active leveraging of existing Commercial-Off-The-Shelf (COTS) and Government-Off-The-Shelf (GOTS) products along with novel redesign approaches to optimize existing solutions to new challenges supported by "buy-try-decide-acquire" acquisition strategies. SPU RCDD initiates efforts such as respiratory breathing systems, biological identification, unmanned aerial and ground platform sensor integration, development of enhanced and augmented reality systems, and modernization of protective Chemical and Biological ensembles that have gone through requirements validation and continues product enhancement development and technology upgrades on currently fielded SOF equipment to counter emerging threats. In FY24, SPU RCDD will continue prototype development and test and evaluation activities to transition critical CBRND capabilities into production for the SOF user to close near-term JSOC capability gaps.

B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2022	FY 2023	FY 2024
Title: 1) AET DEFENSE	-	1.248	2.692
<p>Description: This effort will focus on Expand capabilities of Defense Biological Product Assurance Office. This effort includes Program Management, Product Development, Support, and Testing of technologies that have been demonstrated to be Technology Readiness Level (TRL) 6 or higher in order to rapidly field solutions to combat emerging threats.</p> <p>FY 2023 Plans: Continue efforts to leverage expanded requirements to broaden data set for emerging biological threats and Pharmaceutical Based Agents (PBAs). Produce additional data to better assess detection and decontamination capabilities against new requirements and inform rapid fielding decisions. Conduct field exercises to support Joint Service and interagency tactics, techniques, and procedures (TTP) development and gap analysis for materiel solutions. Assess potential upgrades to systems in the Engineering and Manufacturing Development (EMD) phase of acquisitions to add emerging threat capability prior to or shortly after fielding.</p> <p>FY 2024 Plans: Continue efforts to leverage expanded requirements to broaden data set for emerging biological threats and Pharmaceutical Based Agents (PBAs). Expand efforts to include data for defensive capabilities against three additional emerging threat materials.</p>			

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Chemical and Biological Defense Program		Date: March 2023		
Appropriation/Budget Activity 0400 / 5	R-1 Program Element (Number/Name) PE 0604384BP / <i>Chemical and Biological Defense Program - EMD</i>	Project (Number/Name) UN5 / <i>Understand (SDD)</i>		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2022	FY 2023	FY 2024
<p>Produce additional data to better assess detection and defensive capabilities against new requirements and inform rapid fielding decisions. Produce new data to understand decontamination capabilities against multiple emerging threat materials. Conduct exercises to support Joint Service and interagency tactics, techniques, and procedures (TTP) development and gap analysis for materiel solutions. Assess potential upgrades to systems in the Engineering and Manufacturing Development (EMD) phase of acquisitions to add emerging threat defensive capability prior to or shortly after fielding.</p> <p>FY 2023 to FY 2024 Increase/Decrease Statement: Increase due to significant increase in quantity of emerging threats being assessed for impacts simultaneously. Increase also due to a more thorough understanding of all defensive capabilities, not just sensors, against emerging threats within the AET DEFENSE program.</p>				
<p>Title: 2) AVCAD</p> <p>Description: Product Development, Testing, Support Cost, Program Management Support.</p> <p>FY 2023 Plans: Complete Low Rate Initial Production (LRIP) contract activities and Pharmaceutical Based Agents (PBA) algorithm development to support the Full Rate Production decision. Continue Systems Engineering and other Integrated Product Teams (IPTs) for product development and materiel release. Complete Multi-Service Operational Test and Evaluation (MOT&E) in support of a Full Rate Production decision.</p> <p>FY 2024 Plans: Executing and completing product development and testing. Preparing for Full Rate Production (FRP) to include type classification / materiel release (TCMR). Continue Systems Engineering and other IPTs for product development and materiel release. Complete Multi-Service Operational Test and Evaluation (MOT&E) in support of a Full Rate Production decision. Continue Program management and administration processes to include but not limited to program oversight, resource justification, budgeting and programming, milestone and schedule tracking. Continue Other Government Agency (OGA) Support for logistics and test evaluation results in support of a Full Rate Production decision.</p> <p>FY 2023 to FY 2024 Increase/Decrease Statement: Program/project transitioned to Production and Deployment Phase. Decrease in funding due to program transition to procurement starting in FY24.</p>		-	12.972	11.290
<p>Title: 3) AVCAD</p> <p>Description: Support Costs/Program Management</p> <p>FY 2023 Plans:</p>		-	3.972	-

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Chemical and Biological Defense Program		Date: March 2023		
Appropriation/Budget Activity 0400 / 5	R-1 Program Element (Number/Name) PE 0604384BP / <i>Chemical and Biological Defense Program - EMD</i>	Project (Number/Name) UN5 / <i>Understand (SDD)</i>		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2022	FY 2023	FY 2024
Continue Program management and administration processes to include but not limited to program oversight, resource justification, budgeting and programming, milestone and schedule tracking. Continue OGA Support for logistics and test evaluation results in support of a Full Rate Production decision. FY 2023 to FY 2024 Increase/Decrease Statement: Minor change due to routine program adjustments.				
Title: 4) CB WEARABLES-ENBD Description: This effort will develop and field wearable sensor capabilities and architectures for use across the joint services. FY 2023 Plans: Develops, tests, and evaluates a series of interfaces that connect a family of wearable devices to service-operated combat networks and architectures operating within all phases of multi-domain operations. Conducts advanced development on algorithmic tools used to monitor and predict joint Warfighter exposure to emerging threats and CBRN hazards. FY 2024 Plans: Continues to develop, test, and evaluate a series of interfaces that connect a family of wearable devices to service-operated combat networks and architectures operating within all phases of multi-domain operations. Conducts advanced development on algorithmic tools used to monitor and predict joint warfighter exposure to emerging threats and CBRN hazards. Develops architectures and standards to support integrating existing Government and industry solutions into system level capabilities. FY 2023 to FY 2024 Increase/Decrease Statement: Minor change due to routine program adjustments. Additional investment in enhanced biodefense and pandemic preparedness.		-	38.700	39.201
Title: 5) CSIRP Description: Product Development, Program Management, Test and Evaluation and Support. FY 2023 Plans: Continue chemical sensor integration on an Unmanned Air Systems (UAS) to support the Nuclear, Biological, and Chemical Reconnaissance Vehicles Sensor Suite Upgrade (NBCRV SSU) program, as part of Prototype Plan #2. Continue coordination of demonstrations and test events for additional Service end users. Continue program office management and administration processes to include, but not limited to, program oversight, resource justification, budgeting and programming, milestone and schedule tracking. Continue evaluation of capability and development of Concept of Operations (CONOPS). FY 2024 Plans: Completion of chemical sensor integration on an Unmanned Air Systems (UAS) to support the Nuclear Biological Chemical Reconnaissance Vehicle Sensor Suite Upgrade (NBCRV SSU) program and integration work on Unmanned Surface Vessels		-	12.730	18.505

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Chemical and Biological Defense Program		Date: March 2023		
Appropriation/Budget Activity 0400 / 5	R-1 Program Element (Number/Name) PE 0604384BP / <i>Chemical and Biological Defense Program - EMD</i>	Project (Number/Name) UN5 / <i>Understand (SDD)</i>		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2022	FY 2023	FY 2024
<p>(USV). Initiate repacking and integration of standoff detection, cross platform teaming, and upgrades to autonomous CBRN mapping in denied GBS operations for UASs, as part of the Development Objective Strategy #2. Continue coordination of demonstrations and test events for additional Service end users. Continue program office management and administration processes to include, but not limited to, program oversight, resource justification, budgeting and programming, milestone and schedule tracking. Continue evaluation of capability and development of Concept of Operations (CONOPS).</p> <p>FY 2023 to FY 2024 Increase/Decrease Statement: Increase due to fact of life change in the program/project. Increase in FY24 reflects new service objectives identified in Development Objectives Strategy #2.</p>				
<p>Title: 6) CVCAD</p> <p>Description: Engineering, Manufacturing and Product Development, and Program Management Support</p> <p>FY 2023 Plans: Initiate award Phase III engineering and development tasks following Milestone decision and programmatic activities.</p> <p>FY 2024 Plans: Conduct Engineering and Development tasks to include military standard environmental and false alarm testing, as well as conduct a soldier touch point to assess and measure system performance and assess risk. Continue Program management and administration processes to include but not limited to program oversight, resource justification, budgeting and programming, milestone and schedule tracking.</p> <p>FY 2023 to FY 2024 Increase/Decrease Statement: Increase due to ramp up of engineering and manufacturing development testing and operational testing.</p>		-	3.606	16.834
<p>Title: 7) DBPAP</p> <p>Description: Development</p> <p>FY 2023 Plans: Continue development/expansion of biological threat agents reference materials to known and emerging threats. Continue development of assays and nucleic acid based genomic assays to support fielded and developmental systems. Continue Quality Assurance/Quality Control (QA/QC) testing to encompass the transition and fielding of biological detection assays. Continue to maintain yearly accreditation audits such as ISO 9001, 17025, and Guide 34 certifications. Continue quality actions throughout to maintain the quality managed systems. Continue development of prototypes/information for strains contained in Unified Culture Collection. Supports establishment of a Common Reference Repository - a single source for well-characterized, traceable test</p>		-	8.163	8.313

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Chemical and Biological Defense Program		Date: March 2023
Appropriation/Budget Activity 0400 / 5	R-1 Program Element (Number/Name) PE 0604384BP / <i>Chemical and Biological Defense Program - EMD</i>	Project (Number/Name) UN5 / <i>Understand (SDD)</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2022	FY 2023	FY 2024
<p>articles and vital information for biological defense, effective verification of proficiency testing, improved acquisition of emerging technologies, all at a decreased cost for the individual organizations.</p> <p>FY 2024 Plans: Continue development/expansion of biological threat agents reference materials to known and emerging threats. Continue development of assays and nucleic acid based genomic assays to support fielded and developmental systems. Continue Quality Assurance/Quality Control (QA/QC) testing to encompass the transition and fielding of biological detection assays. Continue to maintain yearly accreditation audits such as ISO 9001, 17025, and Guide 34 certifications. Continue quality actions throughout to maintain the quality managed systems. Continue development of prototypes/information for strains contained in Unified Culture Collection. Supports establishment of a Common Reference Repository - a single source for well-characterized, traceable test articles and vital information for biological defense, effective verification of proficiency testing, improved acquisition of emerging technologies, all at a decreased cost for the individual organizations.</p> <p>FY 2023 to FY 2024 Increase/Decrease Statement: Minor change due to routine program adjustments.</p>			
<p>Title: 8) DBPAP-ENBD</p> <p>Description: Development</p> <p>FY 2023 Plans: Expansion of site locations for increased sequencing capabilities to monitor critical assay performance that detect biothreats, and exchange critical data (sequence information) collected at these sites. (One Site Per Year through FY28). Expanding the repository of collected biothreat genomic information to a government access controlled, cloud-based information center in order to support analytics from the field. Enable exchange of data by creating data compression/decompression capabilities prior to storage and retrieval on GARDIC. Expansion of biorepository of targeted biothreats and toxins strategically against emerging diseases and potential pandemics. Maintain information storage capabilities on DoD Accredited sites.</p> <p>FY 2024 Plans: Continue expansion of site locations for increased sequencing capabilities to monitor critical assay performance that detect biothreats, and exchange critical data (sequence information) collected at these sites. (One Site per Year through FY28). Continue expanding the repository of collected biothreat genomic information to a government access controlled, cloud-based information center to support analytics from the field. Maintain exchange of data by creating data compression/decompression capabilities prior to storage and retrieval on GARDIC. Continue expansion of biorepository of targeted biothreats and toxins strategically against emerging diseases and potential pandemics.</p>	-	2.600	1.900

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Chemical and Biological Defense Program		Date: March 2023		
Appropriation/Budget Activity 0400 / 5	R-1 Program Element (Number/Name) PE 0604384BP / <i>Chemical and Biological Defense Program - EMD</i>	Project (Number/Name) UN5 / <i>Understand (SDD)</i>		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2022	FY 2023	FY 2024
Maintain information storage capabilities on DoD Accredited sites. FY 2023 to FY 2024 Increase/Decrease Statement: Decrease due to change in program/project technical parameters. Reduced infrastructure costs in FY24.				
Title: 9) FFBS Description: Prototype Development FY 2024 Plans: Prototype development and testing effort will focus on the development of prototypes to ensure they are able to meet requirements of decreasing sample to answer time, increasing the ease of use for the preparation of samples, increasing bioinformatics data and software and database development. FY 2023 to FY 2024 Increase/Decrease Statement: Program/project funding transferred from another funding line. Program funding transferred from Biological Defense Improvement Program (BDIP) starting in FY24.		-	-	2.488
Title: 10) WARP Description: Prototype Development: this effort will initiate, prototype, and mature WARP kits, maximizing the use of commercial off-the-shelf and Government off-the-shelf (COTS/GOTS), against validated United States Special Operations Command (USSOCOM) requirements. FY 2024 Plans: Execute integration of commercial off-the-shelf and Government off-the-shelf (COTS/GOTS) CBRN sensors into a visualization tool that is viewable on a customer-specific Team Awareness Kit (TAK) device. FY 2023 to FY 2024 Increase/Decrease Statement: Program/project funding transferred from another funding line. WARP is a byproduct of the required Biological Defense Improvement Program (BDIP) subdivision.		-	-	2.100
Title: 11) WARP Description: Test & Evaluation: this effort will test and evaluate via developmental and operational assessments the capability of the WARP kits. The exit criteria will be a technology readiness level (TRL) 6 or higher system, meeting the validated United States Special Operations Command (USSOCOM) requirements. FY 2024 Plans:		-	-	1.100

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Chemical and Biological Defense Program		Date: March 2023		
Appropriation/Budget Activity 0400 / 5	R-1 Program Element (Number/Name) PE 0604384BP / <i>Chemical and Biological Defense Program - EMD</i>	Project (Number/Name) UN5 / <i>Understand (SDD)</i>		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2022	FY 2023	FY 2024
Execute test and evaluation on the software and communication protocol for the integrated CBRN sensors and the Team Awareness Kit (TAK) device(s).				
FY 2023 to FY 2024 Increase/Decrease Statement: Program/project funding transferred from another funding line. WARP is a byproduct of the required Biological Defense Improvement Program (BDIP) subdivision.				
Title: 12) JBTDS		-	2.596	7.892
Description: Test & Evaluation (T&E)				
FY 2023 Plans: Conduct Low Rate Initial Production T&E activities.				
FY 2024 Plans: Complete Low Rate Initial Production T&E activities.				
FY 2023 to FY 2024 Increase/Decrease Statement: Increase due to fact of life change in the program/project. Increase funds completion of T&E activities to support Full Rate Production (FRP) in FY25.				
Title: 13) MFK		-	-	6.300
Description: Modernization, Development and Continuous Engineering				
FY 2024 Plans: Begin the modernization, development and continuous engineering of MFK, with a focus on hardening the application suite for cyber security. Effort also includes updates to the software based on user feedback in order to maintain operational relevancy.				
FY 2023 to FY 2024 Increase/Decrease Statement: Program/project is new start effort in FY 2024.				
Title: 14) MPCAD		-	2.103	8.265
Description: Product Development, Testing & Program Management				
FY 2023 Plans: Complete two Low Rate Initial Procurement (LRIP) contracts, Government and contracted Integrated Product Development team, systems engineering and Integrated Product Team (IPT) Support. Complete operational testing, Other Government Agency (OGA) support of development and testing of MPCAD systems including development of logistics products, test plans, and				

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Chemical and Biological Defense Program		Date: March 2023		
Appropriation/Budget Activity 0400 / 5	R-1 Program Element (Number/Name) PE 0604384BP / <i>Chemical and Biological Defense Program - EMD</i>	Project (Number/Name) UN5 / <i>Understand (SDD)</i>		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2022	FY 2023	FY 2024
<p>reports. No additional LRIP test articles will be items purchased in FY23. Complete program management efforts including Government system engineering, program/financial management, costing, personnel support and travel.</p> <p>FY 2024 Plans: Complete Vapor Low Rate Initial Procurement (LRIP) product and development (P&D) testing. Complete program management efforts including Government system engineering, program/financial management, costing, personnel support and travel.</p> <p>FY 2023 to FY 2024 Increase/Decrease Statement: Increase due to change in program/project schedule. Increase in FY24 funding required to address vapor testing delays. The FY22 EMD vapor testing experienced performance challenges and lower trials throughput than originally estimated. This pushed end of EMD vapor testing to 3QFY23 and LRIP vapor testing to occur in FY24. Increased the time estimated to complete the LRIP vapor testing based on experience during EMD testing.</p>				
<p>Title: 15) NBCRV SSU</p> <p>Description: Product Development, Program Management, Test and Evaluation and Support.</p> <p>FY 2023 Plans: Continue government strategic planning, systems engineering, logistics, training, test and evaluation, technical support, integration, and system level developmental testing.</p> <p>FY 2024 Plans: Continue government strategic planning, systems engineering, logistics, training, test and evaluation, technical support, integration, and developmental testing. Complete Limited User Test for Capability Set 2.1 (CS2.1). Complete CBRN sensor and integrated sensor suite prototype development, and maturation of CS2.2, and initiate CS2.2 developmental testing. Continue program office management and administration processes to include but not limited to program oversight, resource justification, budgeting and programming, milestone and schedule tracking. Continue program office management and administration processes.</p> <p>FY 2023 to FY 2024 Increase/Decrease Statement: Increase due to change in program/project schedule. Increase due to refined CS2.2 test cost estimate based on CS2.2 scope within Test and Evaluation Master Plan (TEMP) approved on 7 March 2022, and completing chemical surface detection development in CS2.2 configuration prior to beginning test activities in FY24.</p>		-	16.916	21.629
<p>Title: 16) NGDS 2 CHEMDX</p> <p>Description: Engineering and Manufacturing Development.</p> <p>FY 2023 Plans:</p>		-	5.288	7.808

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Chemical and Biological Defense Program		Date: March 2023		
Appropriation/Budget Activity 0400 / 5	R-1 Program Element (Number/Name) PE 0604384BP / <i>Chemical and Biological Defense Program - EMD</i>	Project (Number/Name) UN5 / <i>Understand (SDD)</i>		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2022	FY 2023	FY 2024
Continue engineering and manufacturing development, initiate developmental testing. FY 2024 Plans: Continue Engineering Development, conduct Development Testing and Operational User Evaluations, begin clinical trials. FY 2023 to FY 2024 Increase/Decrease Statement: Increase due to change in program/project schedule.				
Title: 17) NGDS 2 MPDS Description: Engineering and Manufacturing Development. FY 2023 Plans: Continues hardware and software development based on new material solution. Continues assay development based on new material solution leveraging work accomplished based on previous material solution. Management of hardware and software configurations. Plans for two clinical trial starts. FY 2024 Plans: Continue hardware, software, assay development; instrument developmental testing, and analytical testing/ two clinical trials. FY 2023 to FY 2024 Increase/Decrease Statement: Increase due to fact of life change in the program/project.		-	6.914	19.359
Title: 18) SPCHAR-ENBD Description: This effort will focus on Innovative Contact Tracing. FY 2023 Plans: Integrates innovative and emerging contact tracing capabilities stemming from the Joint Emergent Operational Needs Statement (JEONS) JS-0003 response into the pre-symptomatic exposure wearable system outlined in CB WEARABLES-ENBD. FY 2023 to FY 2024 Increase/Decrease Statement: Efforts will wind down by end of fiscal year FY23, with no additional resources required in FY24.		-	1.400	-
Title: 19) SPU RCDD Description: Advanced Development: this line includes Product Development, Test and Evaluation, Management Services, and Support to mature technology across multiple commodity areas to rapidly field solutions in response to emergent threats. FY 2023 Plans:		-	6.863	7.050

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Chemical and Biological Defense Program		Date: March 2023
Appropriation/Budget Activity 0400 / 5	R-1 Program Element (Number/Name) PE 0604384BP / <i>Chemical and Biological Defense Program - EMD</i>	Project (Number/Name) UN5 / <i>Understand (SDD)</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2022	FY 2023	FY 2024
Continue developing, prototyping, and maturing CBRND technologies to rapidly equip users with capabilities in response to new and emerging threats and opportunities. Continue developing Special Operations Command (SOCOM) specific Unmanned Ground Vehicle (UGV) and Unmanned Aerial Vehicle (UAV) sensor integration and closing Joint Special Operations Command (JSOC) capability gaps.			
FY 2024 Plans: Continue developing, prototyping, and maturing CBRND technologies to rapidly equip users with capabilities in response to new and emerging threats and opportunities. Continue developing prototype systems across the CBDP commodity areas in order to close Joint Special Operations Command (JSOC) capability gaps.			
FY 2023 to FY 2024 Increase/Decrease Statement: Minor change due to routine program adjustments.			
Accomplishments/Planned Programs Subtotals	-	126.071	182.726

C. Other Program Funding Summary (\$ in Millions)											
<u>Line Item</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u> <u>Base</u>	<u>FY 2024</u> <u>OCO</u>	<u>FY 2024</u> <u>Total</u>	<u>FY 2025</u>	<u>FY 2026</u>	<u>FY 2027</u>	<u>FY 2028</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
• CA4: Contamination Avoidance (ACD&P)	37.189	-	-	-	-	-	-	-	-	0.000	37.189
• CA5: Contamination Avoidance (SDD)	84.967	-	-	-	-	-	-	-	-	0.000	84.967
• IP5: Individual Protection (SDD)	18.690	-	-	-	-	-	-	-	-	0.000	18.690
• IP7: Individual Protection (Op Sys Dev)	11.659	-	-	-	-	-	-	-	-	0.000	11.659
• MB4: Medical Biological Defense (ACD&P)	46.791	-	-	-	-	-	-	-	-	0.000	46.791
• MB5: Medical Biological Defense (SDD)	138.156	-	-	-	-	-	-	-	-	0.000	138.156
• UN4: Understand (ACD&P)	-	52.708	61.638	-	61.638	64.399	48.874	41.264	38.169	Continuing	Continuing
• UN7: Understand (Op Sys Dev)	-	40.414	50.603	-	50.603	58.881	71.869	68.839	50.628	Continuing	Continuing
• JX0210: Defense Biological Products Assurance Program (DBPAP)	2.760	2.736	2.736	-	2.736	2.736	2.736	2.736	2.736	Continuing	Continuing

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Chemical and Biological Defense Program **Date:** March 2023

Appropriation/Budget Activity 0400 / 5	R-1 Program Element (Number/Name) PE 0604384BP / Chemical and Biological Defense Program - EMD	Project (Number/Name) UN5 / Understand (SDD)
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C. Other Program Funding Summary (\$ in Millions)

Line Item	FY 2022	FY 2023	FY 2024	FY 2024	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028	Cost To	
			Base	OCO	Total					Complete	Total Cost
• MX0001: Joint Bio Tactical Detection System (JBTDSD)	17.060	-	7.025	-	7.025	22.238	17.385	44.150	44.150	Continuing	Continuing
• PHM018: SPU Rapid Capability Development And Demo (SPU RCDD)	10.834	9.914	49.455	-	49.455	20.689	20.180	24.216	26.638	Continuing	Continuing
• SA0005: CBRN Sensor Integration On Robotic Platforms (CSIRP)	3.461	2.099	-	-	-	-	-	-	-	0.000	6.063
• SA0015: Aerosol Vapor Chemical Agent Detector (AVCAD)	-	-	2.458	-	2.458	43.262	55.762	66.237	43.029	Continuing	Continuing
• SA0017: Multiphase Chemical Agent Detector (MPCAD)	6.502	4.014	13.561	-	13.561	21.852	36.758	37.261	0.829	Continuing	Continuing
• SA0024: Compact Vapor Chemical Agent Detector (CVCAD)	-	-	-	-	-	-	0.585	8.200	22.144	Continuing	Continuing
• SA0043: Next Gen Diag 2 Chemical Diagnostics (NGDS 2 CHEM DX)	-	-	1.881	-	1.881	9.579	10.982	11.898	11.861	Continuing	Continuing
• SA0044: Next Gen Diag 2 Man Portable Diagnostic System (NGDS 2 MPDS)	0.336	-	-	-	-	7.949	7.291	4.752	2.290	Continuing	Continuing
• SA0055: Wearable All Hazard Remote Monitoring Program (WARP)	-	-	-	-	-	17.500	-	-	-	Continuing	Continuing
• SA0056: Nuclear Biological Chemical Reconnaissance Vehicle Sensor Suite Upgrade (NBCRV SSU)	-	-	16.795	-	16.795	-	15.525	15.561	16.222	Continuing	Continuing

Remarks

D. Acquisition Strategy

ADVANCED AND EMERGING THREAT DEFENSE (AET DEFENSE)

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Chemical and Biological Defense Program	Date: March 2023
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Appropriation/Budget Activity 0400 / 5	R-1 Program Element (Number/Name) PE 0604384BP / <i>Chemical and Biological Defense Program - EMD</i>	Project (Number/Name) UN5 / <i>Understand (SDD)</i>
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The AET DEFENSE program will use a variety of acquisition approaches to survey, develop, assess, and rapidly field technologies to inform and fill advanced and emerging threat defensive capability gaps. The program will utilize existing Multiple Award Indefinite Delivery Indefinite Quantify Task Order Contracts to provide technical support to studies and assessments of performance against emerging threat. For Program of Record (PoR) systems currently in development that will be assessed for performance against emerging threats, those PoR's existing contracts will be modified to incorporate development engineering and test support for emerging threat capability. The AET DEFENSE program will utilize Other Transaction Authority (OTA) agreements for system development and prototyping activities and Government Agencies and Federally Funded Research and Development Centers to provide development, testing and technical support.

AEROSOL VAPOR CHEMICAL AGENT DETECTOR (AVCAD)

The AVCAD program is conducting full Engineering & Manufacturing Development (EMD) Record Testing in support of the Milestone C decision. The program intends to award the low rate initial production (LRIP) as an existing option leveraging the current contract. Upon completion of Production & Deployment test activities, full rate production options are also available.

CHEMICAL AND BIOLOGICAL WEARABLES-ENHANCED BIODEFENSE (CB WEARABLES-ENBD)

CB Wearables-ENBD will leverage a presumed hybrid acquisition strategy that will use the software acquisition pathway to integrate and field software algorithms developed under the PM2S program, as well as middle tier of acquisition to develop and integrate Government Off-The-Shelf (GOTS) hardware needed for deployment on service-sponsored networks and weapons platforms.

CBRN SENSOR INTEGRATION ON ROBOTIC PLATFORMS (CSIRP)

CSIRP is a streamlined and tailored acquisition effort to rapidly prototype and field CBRN payload capabilities for unmanned platforms. CSIRP will provide and integrate unmanned CBRN payload prototypes in cyclic prototyping plan cycles based on service requirements. The prototyping plans will use a streamlined acquisition process in order to keep pace with industry and the rapid advancement of technologies. The CSIRP strategy is to utilize the rapid prototyping process enabled by the Other Transactional Agreements (OTA) contract vehicle. Upon award, the awardees will have two to three years to produce prototype sensors that are integrated onto service selected (air and/or ground) platforms. These prototypes will be demonstrated, evaluated and tested by the Services as well as laboratories and academia. Successful prototypes will be transitioned to the platforms and services for the next steps in acquisition, production and eventual fielding across the services. BA5 funding provides integration, demonstrations, testing, development of interface control documentation, and operational assessments of prototypes to support transition decisions for residual capabilities and final configurations to Program of Record (PoR) or sustained capability.

COMPACT VAPOR CHEMICAL AGENT DETECTOR (CVCAD)

The CVCAD program will use the Combating Weapons of Mass Destruction Other Transaction Authority (CWMD OTA) contract vehicle to transition four technologies from Science & Technology (S&T) into the program of record. This streamlined acquisition approach is broken into four phases; Phase I S&T advanced development, Phase II technology transition maturation evaluation, Phase III competitive prototyping down select and Engineering decision. Phase IV will execute Production and

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<p>Development for low rate initial production (LRIP) systems. CVCAD will procure full rate production (FRP) items through a follow-on Federal Acquisition Regulation based contract.</p> <p>DEFENSE BIOLOGICAL PRODUCTS ASSURANCE PROGRAM (DBPAP)</p> <p>DBPAP utilizes best buying principles and acquisition rigor for alignment to requirements to perform an “enabling” function for certain programs of record (e.g., Analytical Lab System (ALS), Common Analytical Lab System (CALs), Next Generation Diagnostic System (NGDS)) and other enterprise partners. The DBPAP uses better buying power to consolidate requirements for “commodity-like” biological detection products. The DBPAP coordinates closely with the Joint, Science and Technology Office to enhance the DBPAP reference material holdings in the Unified Culture Collection (UCC); improve antibodies and expand the portfolio of DBPAP immunoassays and reagents; and develop new molecular assays. The DBPAP uses a mix of competitive commercial contracts and funding of government laboratories to produce high quality assays and reagents.</p> <p>DEFENSE BIOLOGICAL PRODUCTS ASSURANCE PROGRAM-ENHANCED BIODEFENSE (DBPAP-ENBD)</p> <p>The DBPAP-ENBD provides increased capabilities above baseline abilities by utilizing best buying principles and acquisition rigor for alignment to requirements to perform an “enabling” function for certain programs of record (e.g., ALS, CALs, NGDS) and other enterprise partners. The DBPAP-ENBD uses better buying power to consolidate requirements for “commodity-like” biological detection products. The DBPAP-ENBD coordinates closely with the Joint, Science and Technology Office to enhance the DBPAP-ENBD reference material holdings in the Unified Culture Collection (UCC); improve antibodies and expand the portfolio of DBPAP-ENBD immunoassays and reagents; and develop new molecular assays. The DBPAP-ENBD uses a mix of competitive commercial contracts and funding of government laboratories to produce high quality assays and reagents.</p> <p>Far Forward Biological Sequencing</p> <p>Anticipate Assistant Secretary of the Army for Acquisition, Logistics, & Technology approval of the FFBS acquisition strategy by 1st Quarter FY23. The FFBS Prototype development was conducted via iterative process of early user feedback and assessments, and laboratory testing with biological agents. FFBS is a bio-sequencing Commercial Off-The-Shelf (COTS) system that is integrated into a stand-alone military-hardened hand-held system that added battery life, reduced size and weight and provided a bioinformatics database on the system (vice COTS product that uses a laptop). Sample preparation procedures developed for Special Operations Forces (SOF) users’ skill set and refined library preparation to reduce data output timeline from weeks to hours. FFBS will seek a competitive production award in FY25 to meet Initial Operational Capability (IOC) in 4QFY26 and Full Operational Capability (FOC) in 4QFY27.</p> <p>Wearable All Hazard Remote Monitoring Program</p> <p>Wearable All Hazard Remote Monitoring Program (WARP) will leverage other Joint Program Executive Office for Chemical, Biological, Radiological, and Nuclear Defense (JPEO-CBRND) developmental efforts that integrate CBRN sensors and COTS physiological monitoring devices into a common network infrastructure for</p>		

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display on Tactical Assault Kit devices in order to capitalize on previous development. This will be accomplished through Multiple Award Indefinite Delivery Indefinite Quantify Task Order and Government Agencies for prototype development, test and evaluation, and technical support.

JOINT BIO TACTICAL DETECTION SYSTEM (JBTDS)

The JBTDS program utilizes a streamlined acquisition strategy leveraging a contract with Chemring Sensors and Electronic Systems (CSES). The contract includes options for Low Rate Initial Production (LRIP) and Full Rate Production (FRP). The JBTDS is moving towards a MS C decision in third quarter FY23, utilizing the current contract to award both the LRIP and FRP options. To support the National Guard requirement, the Joint Handheld Biological Identifier (JHBI) will award congruently with the JBTDS LRIP and FRP options. The JBTDS program uses an agile acquisition strategy which leverages current technologies, recognizing up front the need for potential technology insertion to provide more cost effective capabilities.

Mobile Field Kit

Development of MFK will transition from the Defense Threat Reduction Agency (DTRA) by coordinating a Joint Development plan that addresses current technical and acquisition shortfalls and limitations. MFK will manage the continuous engineering process in support of National Guard Bureau operations by assuming control of the requirements generation process and incrementally modernizing the software architecture. Additional work includes modernizing the MFK architecture to make it interoperable with the Joint architecture, and assessing and validating cyber security. The long-term strategy is to align MFK with the CBRN Support to C2 (CSC2) program, provide a capability to CSC2 in order to support the Homeland Defense Mission, and finally manage MFK as an application that supports CSC2. This strategy will be executed without impacting the current operational relevancy of MFK.

MULTI-PHASE CHEMICAL AGENT DETECTOR (MPCAD)

The MPCAD is using a streamlined acquisition strategy. The MPCAD contract(s) are utilizing the Countering Weapons of Mass Destruction (CWMD) Other Transaction Authority (OTA) for EMD and LRIP items. The MPCAD will procure production items through a follow-on Federal Acquisition Regulation based contract. The program will develop and validate the systems during EMD and LRIP utilizing two contractors to increase competition and minimize production price.

Nuclear Biological Chemical Reconnaissance Vehicle Sensor Suite Upgrade

Nuclear Biological Chemical Reconnaissance Vehicle Sensor Suite Upgrade (NBCRV SSU) is an upgrade for the Stryker NBCRV. The Army Requirements Oversight Council (AROC) Review Board (ARB) decided on 1 FEB 2022 to continue a Modification Work Order (MWO) pathway for Capability Set 2.1 (CS2.1) (initial SSU capability) as a bridge to CS2.2 (full SSU capability). The NBCRV SSU program received prototype CS2.1 systems via Other Transaction Authority (OTA) in March 2022, and will continue testing through October 2023, to inform a Conditional Materiel Release Decision in FY24. An In Progress Review (IPR) will be held starting in FY23 to execute an MWO for CS2.1 production and fielding, starting in FY24. The NBCRV SSU program will receive prototype CS2.2 systems via another OTA in August 2024, followed by testing in FY24 through early FY26 to inform the CS2.2 MWO Full Materiel Release Decision in FY26.

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NEXT GEN DIAG 2 CHEMICAL DIAGNOSTICS (NGDS 2 CHEMDX)

NGDS 2 ChemDx is using an Other Transactions Authority (OTA) agreement to take advantage of nontraditional Defense contractor offerings, leveraging commercial technology to develop a capability for the diagnosis of nerve agent exposure in individuals. The OTA agreement holder is conducting system development, clinical trials and pre-developmental testing. ChemDx will use Department of Defense (DoD) test agencies to conduct Development Testing (DT) and operational user evaluations. Clinical trials will inform approval of the ChemDx system by the U.S. Food and Drug Administration.

NEXT GEN DIAG 2 MAN PORTABLE DIAGNOSTIC SYSTEM (NGDS 2 MPDS)

NGDS 2 MPDS is currently in engineering and manufacturing development (EMD). MPDS is using Other Transactions Authority (OTA) agreements to take advantage of nontraditional Defense contractor offerings. MPDS will use the agreement holder to develop the system and assays, conduct the clinical trials, and for pre-developmental testing (pre-DT) instrument testing. MPDS will be using DoD clinical trial sites to support the agreement holder. MPDS will be using Department of Defense (DoD) agencies to conduct Developmental Testing (DT), operational assessment (OA), and Initial Operational Test & Evaluation (IOT&E).

SURVEILLANCE AND PATHOGEN CHARACTERIZATION-ENHANCED BIODEFENSE (SPCHAR-ENBD)

SPCHAR-ENBD (contact tracing) sunsets at the end of FY23 and will integrate all capabilities into the CB-Wearables ENBD.

SPU RAPID CAPABILITY DEVELOPMENT AND DEPLOYMENT (SPU RCDD)

The SPU RCDD overall acquisition strategy allows for rapid prototyping and testing of novel and modified Commercial Off-The-Shelf (COTS) or Government Off-The-Shelf (GOTS) systems against mission critical capabilities to enhance mission success. The SPU RCDD will use technical and functional evaluations of currently fielded items to identify materiel that requires modernization and incorporate operationally-relevant system developments. This will be accomplished through competitive contracting vehicles such as Multiple Award Indefinite Delivery Indefinite Quantify Task Order and the Countering Weapons of Mass Destruction Other Transaction Authority (CWMD OTA) for the development of prototype test assets. The SPU RCDD will use Government Agencies for prototype development, test and evaluation, and technical support.

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Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
AET DEFENSE - HW C - Protection Capability Prototyping	Various	Various : N/A	-	0.000		0.197	Feb 2023	0.280	Jan 2024	-		0.280	Continuing	Continuing	0.000
AET DEFENSE - HW S - System Prototyping and Modification	Various	Various : N/A	-	0.000		0.197	Feb 2023	0.000		-		0.000	0.000	0.197	0.000
AET DEFENSE - HW S - Emerging threat detection/decontamination/protection capability engineering development	Various	Various : N/A	-	0.000		0.197	Jan 2023	0.000		-		0.000	0.000	0.197	0.000
AET DEFENSE - HW C - Emerging Threat Detection	MIPR	U.S. Army Combat Capabilities Development Command (DEVCOM) Chemical Biological Center (CBC) : Aberdeen Proving Ground, MD	-	0.000		0.000		0.964	Mar 2024	-		0.964	Continuing	Continuing	0.000
AVCAD - Government Product Development Team Labor	MIPR	Various : N/A	-	0.000		2.200	Nov 2022	1.850	Feb 2024	-		1.850	Continuing	Continuing	0.000
AVCAD - HW S - P&D Contract	C/CPIF	Smiths Detection : Edgewood, MD	-	0.000		6.019	Nov 2022	0.000		-		0.000	0.000	6.019	0.000
AVCAD - SW C - Pharmaceutical Based Agent (PBA) Development	C/CPIF	TBD : N/A	-	0.000		0.600	Nov 2022	0.000		-		0.000	0.000	0.600	0.000
CB WEARABLES-ENBD - SW C - Software Interface Development	C/CPFF	Various : N/A	-	0.000		10.460	Jan 2023	13.430	Jan 2024	-		13.430	Continuing	Continuing	0.000
CB WEARABLES-ENBD - HW C - Platform Development	C/CPFF	Various : N/A	-	0.000		19.816	Jan 2023	14.410	Jan 2024	-		14.410	Continuing	Continuing	0.000

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Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
CSIRP - HW C - Government Product Development Team Labor	MIPR	U.S. Army Combat Capabilities Development Command (DEVCOM) Chemical Biological Center (CBC) : Aberdeen Proving Ground, MD	-	0.000		1.900	Nov 2022	1.900	Nov 2023	-		1.900	Continuing	Continuing	0.000
CSIRP - HW C - Contractor Product Development Team Labor	C/FFP	Various : N/A	-	0.000		0.500	Feb 2023	0.540	Feb 2024	-		0.540	Continuing	Continuing	0.000
CSIRP - HW C - Chem Sensor Design	Various	Various : N/A	-	0.000		1.300	Nov 2022	1.600	Nov 2023	-		1.600	Continuing	Continuing	0.000
CSIRP - HW C - UAS Manufacturing and Design	MIPR	Various : N/A	-	0.000		3.000	Nov 2022	5.500	Nov 2023	-		5.500	Continuing	Continuing	0.000
CSIRP - SW C - UAS and Sensor Manufacturing and Design	C/CPFF	T2S Solutions (T2S, LLC) : Belcamp, MD	-	0.000		1.468	Nov 2022	0.000		-		0.000	0.000	1.468	0.000
CSIRP - HW C - Sensor Integration	C/FFP	FLIR Systems, Inc. : Elkridge, MD	-	0.000		0.000		2.500	Nov 2023	-		2.500	Continuing	Continuing	0.000
CSIRP - SW C - Sensor Integration	C/CPFF	Charles Stark Draper Laboratories, Inc. : Cambridge, MA	-	0.000		1.000	Nov 2022	1.400	Nov 2023	-		1.400	Continuing	Continuing	0.000
CVCAD - HW S - CWMD OTA Phase 3 Task Awards	MIPR	Advanced Technologies International : Summerville, SC	-	0.000		3.572	Jun 2023	9.200	May 2024	-		9.200	Continuing	Continuing	0.000
DBPAP - HW C - Development of Select Biological Threat Agent Reference Materials and Assays	MIPR	Various : N/A	-	0.000		3.618	Mar 2023	4.869	Feb 2024	-		4.869	Continuing	Continuing	0.000
DBPAP-ENBD - HW C - Targeted Acquisition of Reference Materials	MIPR	Various : N/A	-	0.000		2.600	Feb 2023	1.900	Feb 2024	-		1.900	Continuing	Continuing	0.000

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Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Augmenting Capabilities (TARMAC) initiative															
FFBS - HW S - Hardware - prototype refinement and maturation	Various	Various : N/A	-	0.000		0.000		1.363	Apr 2024	-		1.363	Continuing	Continuing	0.000
WARP - HW C - Prototype Development	Various	Various : N/A	-	0.000		0.000		2.100	Dec 2023	-		2.100	Continuing	Continuing	0.000
JBTDTS - Government Product Development Team Labor	MIPR	Various : N/A	-	0.000		0.442	Jan 2023	0.829	Jan 2024	-		0.829	Continuing	Continuing	0.000
MFK - SW S - Modernization	C/CPFF	Various : N/A	-	0.000		0.000		3.000	Oct 2023	-		3.000	Continuing	Continuing	0.000
MFK - SW S - Cyber Security Sustainment	MIPR	TBD : N/A	-	0.000		0.000		0.620	Mar 2024	-		0.620	Continuing	Continuing	0.000
MFK - SW S - CSC2 Interoperability	C/CPFF	Various : N/A	-	0.000		0.000		0.389	Mar 2024	-		0.389	Continuing	Continuing	0.000
MPCAD - HW S - EMD Contract	C/CPFF	FLIR Systems, Inc. : West Lafayette, IN	-	0.000		0.750	Nov 2022	1.035	Nov 2023	-		1.035	Continuing	Continuing	0.000
MPCAD - HW S - EMD Contract	C/CPFF	Signature Science : Austin, TX	-	0.000		0.639	Nov 2022	1.035	Nov 2023	-		1.035	Continuing	Continuing	0.000
MPCAD - PM/MS S - Government Team Labor	MIPR	U.S. Army Combat Capabilities Development Command (DEVCOM) Chemical Biological Center (CBC) : Aberdeen Proving Ground, MD	-	0.000		0.200	Nov 2022	1.804	Nov 2023	-		1.804	Continuing	Continuing	0.000
MPCAD - HW C - Contract Support	C/FFP	Various : N/A	-	0.000		0.000		0.161	Feb 2024	-		0.161	Continuing	Continuing	0.000
NBCRV SSU - HW C - Virtual Trainer	Various	Various : N/A	-	0.000		1.419	Nov 2022	0.000		-		0.000	0.000	1.419	0.000

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Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
NBCRV SSU - HW C - Government Product Development Team Labor	MIPR	U.S. Army Combat Capabilities Development Command (DEVCOM) Chemical Biological Center (CBC) : Aberdeen Proving Ground, MD	-	0.000		2.535	Nov 2022	0.000		-		0.000	0.000	2.535	0.000
NBCRV SSU - HW C - Contractor Team Labor	C/FFP	Various : N/A	-	0.000		0.549	Feb 2023	0.000		-		0.000	0.000	0.549	0.000
NBCRV SSU - SW C - Integration	C/FFP	FLIR Systems Inc. : Elkridge, MD	-	0.000		2.223	Nov 2022	7.418	Nov 2023	-		7.418	Continuing	Continuing	0.000
NGDS 2 CHEMDX - HW C - Product Development	C/CPFF	MRIGlobal : Kansas City, MO	-	0.000		2.657	Feb 2023	3.895	Dec 2023	-		3.895	Continuing	Continuing	0.000
NGDS 2 CHEMDX - HW C - Product Management	Various	Various : N/A	-	0.000		1.954	Dec 2022	2.304	Dec 2023	-		2.304	Continuing	Continuing	0.000
NGDS 2 MPDS - HW C - Product Development	C/CPFF	Cepheid : Sunnyvale, CA	-	0.000		3.162	Mar 2023	11.870	Dec 2023	-		11.870	Continuing	Continuing	0.000
NGDS 2 MPDS - HW C - Product Management	Various	Various : N/A	-	0.000		2.370	Dec 2022	3.930	Dec 2023	-		3.930	Continuing	Continuing	0.000
SPCHAR-ENBD - SW C - JEONS JS 0003 Integration	C/CPFF	Various : N/A	-	0.000		1.000	Jan 2023	0.000		-		0.000	0.000	1.000	0.000
SPU RCDD - HW C - Prototype Procurement	Various	Various : N/A	-	0.000		4.802	Dec 2022	4.156	Dec 2023	-		4.156	Continuing	Continuing	0.000
Subtotal			-	0.000		83.346		106.252		-		106.252	Continuing	Continuing	N/A

Support (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
AVCAD - ES C - OGAs	MIPR	Various : N/A	-	0.000		3.017	Nov 2022	2.907	Nov 2023	-		2.907	Continuing	Continuing	0.000

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Support (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
CB WEARABLES-ENBD - ES S - Systems Engineering Support Services	MIPR	Various : N/A	-	0.000		4.023	Jan 2023	5.200	Dec 2023	-		5.200	Continuing	Continuing	0.000
CSIRP - ES C - Engineering Support	Various	Various : N/A	-	0.000		0.390	Nov 2022	0.395	Nov 2023	-		0.395	Continuing	Continuing	0.000
CVCAD - OGA Support and Analysis	Various	Various : N/A	-	0.000		0.000		3.000	Feb 2024	-		3.000	Continuing	Continuing	0.000
DBPAP - Select Biological Threat Agent Reference Material Support	MIPR	Various : N/A	-	0.000		1.683	Mar 2023	1.714	Feb 2024	-		1.714	Continuing	Continuing	0.000
DBPAP - Select Biological Threat Agent Reference Material Regulatory/Quality Assurance (QA) Support	MIPR	Edgewood Chemical Biological Center (ECBC) : Aberdeen Proving Ground, MD	-	0.000		1.699	Mar 2023	1.730	Feb 2024	-		1.730	Continuing	Continuing	0.000
FFBS - ES S - System engineering and design support	Various	Various : N/A	-	0.000		0.000		0.212	Nov 2023	-		0.212	Continuing	Continuing	0.000
JBTDS - Contract and Product Support	MIPR	Various : N/A	-	0.000		0.546	Nov 2022	0.000		-		0.000	0.000	0.546	0.000
MFK - ES S - Program Support	TBD	Various : N/A	-	0.000		0.000		0.550	Oct 2023	-		0.550	Continuing	Continuing	0.000
NBCRV SSU - ES C - Stryker NBCRV Maintenance	C/FFP	General Dynamics Land Systems : Detroit, MI	-	0.000		4.043	Nov 2022	0.900	Nov 2023	-		0.900	Continuing	Continuing	0.000
NBCRV SSU - ILS C - Logistic Support	C/FFP	TBD : N/A	-	0.000		0.250	Nov 2022	0.000		-		0.000	0.000	0.250	0.000
NBCRV SSU - ES C - Contract and Product Support	Various	Various : N/A	-	0.000		1.350	Nov 2022	0.000		-		0.000	0.000	1.350	0.000
SPU RCDD - Engineering Support	Various	Various : N/A	-	0.000		0.626	Dec 2022	0.669	Dec 2023	-		0.669	Continuing	Continuing	0.000
Subtotal			-	0.000		17.627		17.277		-		17.277	Continuing	Continuing	N/A

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Test and Evaluation (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
AET DEFENSE - DTE C - Technology Assessments	MIPR	Various : N/A	-	0.000		0.284	Feb 2023	0.300	Mar 2024	-		0.300	Continuing	Continuing	0.000
AET DEFENSE - DTE S - Technology Assessments	Various	Various : N/A	-	0.000		0.284	Dec 2022	0.000		-		0.000	0.000	0.284	0.000
AET DEFENSE - DTE C - Technology Assessments	MIPR	U.S. Army Combat Capabilities Development Command (DEVCOM) Chemical Biological Center (CBC) : Aberdeen Proving Ground, MD	-	0.000		0.000		0.906	Mar 2024	-		0.906	Continuing	Continuing	0.000
AVCAD - OTE C - DT/OT Test Activities	MIPR	Various : N/A	-	0.000		3.300	Nov 2022	5.374	Jun 2024	-		5.374	Continuing	Continuing	0.000
CB WEARABLES-ENBD - DTE S - System DT&E	MIPR	Various : N/A	-	0.000		0.725	Jan 2023	1.475	Jan 2024	-		1.475	Continuing	Continuing	0.000
CSIRP - DTE C - Testing and Evaluation	Various	Various : N/A	-	0.000		1.500	Nov 2022	1.530	Nov 2023	-		1.530	Continuing	Continuing	0.000
CSIRP - DTE C - JHU Applied Physics Lab	MIPR	Johns Hopkins University - Applied Physics Lab : Laurel, MD	-	0.000		0.400	Nov 2022	0.660	Jan 2024	-		0.660	Continuing	Continuing	0.000
CVCAD - DTE S - Developmental Test Activities	MIPR	Various : N/A	-	0.000		0.000		2.834	May 2024	-		2.834	Continuing	Continuing	0.000
FFBS - DTE S - T&E for prototype refinement and maturation	Various	Various : N/A	-	0.000		0.000		0.665	Apr 2024	-		0.665	Continuing	Continuing	0.000
WARP - DTE C - Prototype Testing	Various	Various : N/A	-	0.000		0.000		1.100	Dec 2023	-		1.100	Continuing	Continuing	0.000
JBTDS - Operational Assessment	MIPR	Various : N/A	-	0.000		0.000		3.000	Feb 2024	-		3.000	Continuing	Continuing	0.000
JBTDS - DT/OT Test Activities	MIPR	Various : N/A	-	0.000		1.439	Nov 2022	3.125	Feb 2024	-		3.125	Continuing	Continuing	0.000

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Chemical and Biological Defense Program **Date:** March 2023

Appropriation/Budget Activity 0400 / 5	R-1 Program Element (Number/Name) PE 0604384BP / Chemical and Biological Defense Program - EMD	Project (Number/Name) UN5 / Understand (SDD)
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Test and Evaluation (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
MFK - DTE S - Integration and Interoperability T&E	MIPR	Various : N/A	-	0.000		0.000		1.200	Oct 2023	-		1.200	Continuing	Continuing	0.000
MPCAD - DTE C - Program Management Evaluation for Solid/Liquid Vapor Testing	MIPR	West Desert Test Center : Dugway, UT	-	0.000		0.150	Nov 2022	0.000		-		0.000	0.000	0.150	0.000
MPCAD - DTE C - DT/OT Chemical Chamber Event	MIPR	West Desert Test Center : Dugway, UT	-	0.000		0.164	Nov 2022	1.000	Dec 2023	-		1.000	Continuing	Continuing	0.000
MPCAD - OTE S - Multi-Service Test	MIPR	Operational Test Command (OTC) : Fort Hood, TX	-	0.000		0.000		0.838	Nov 2023	-		0.838	Continuing	Continuing	0.000
MPCAD - DTE C - CVI, Program Support, OGA Support, CBRCS, Non-Chemical testing	MIPR	Various : N/A	-	0.000		0.000		1.607	Dec 2023	-		1.607	Continuing	Continuing	0.000
NBCRV SSU - DTE C - Test and Evaluation	Various	TBD : N/A	-	0.000		2.855	Nov 2022	0.000		-		0.000	0.000	2.855	0.000
NBCRV SSU - DTE C - Component Level Developmental Testing	MIPR	West Desert Test Center : Dugway, UT	-	0.000		0.000		1.200	Nov 2023	-		1.200	Continuing	Continuing	0.000
NBCRV SSU - DTE C - Component Level Developmental Testing	C/FFP	MRIGlobal : Kansas City, MO	-	0.000		0.000		1.800	Nov 2023	-		1.800	Continuing	Continuing	0.000
NBCRV SSU - DTE C - System Level Testing Developmental Testing	MIPR	Aberdeen Test Center (ATC) : Aberdeen Proving Ground, MD	-	0.000		0.000		7.000	Nov 2023	-		7.000	Continuing	Continuing	0.000
NGDS 2 CHEMDX - DTE S - Testing	MIPR	Various : N/A	-	0.000		0.200	Apr 2023	0.750	Dec 2023	-		0.750	Continuing	Continuing	0.000
NGDS 2 MPDS - OTHT C - Analytical/Clinical Testing	MIPR	U.S. Army Medical Research and Development Command	-	0.000		0.733	May 2023	1.430	Dec 2023	-		1.430	Continuing	Continuing	0.000

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Chemical and Biological Defense Program **Date:** March 2023

Appropriation/Budget Activity 0400 / 5	R-1 Program Element (Number/Name) PE 0604384BP / Chemical and Biological Defense Program - EMD	Project (Number/Name) UN5 / Understand (SDD)
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Test and Evaluation (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
		(USAMRDC) : Fort Detrick, MD													
SPU RCDD - DTE C - Testing and Evaluation	MIPR	U.S. Army Combat Capabilities Development Command (DEVCOM) Chemical Biological Center (CBC) : Aberdeen Proving Ground, MD	-	0.000		0.449	Dec 2022	1.249	Dec 2023	-		1.249	Continuing	Continuing	0.000
Subtotal			-	0.000		12.483		39.043		-		39.043	Continuing	Continuing	N/A

Management Services (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
AET DEFENSE - PM/MS S - IPT Support/Program Management	MIPR	JPEO Chem, Bio, Rad, and Nuc Defense (JPEO-CBRND) : Aberdeen Proving Ground, MD	-	0.000		0.089	Dec 2022	0.242	Dec 2023	-		0.242	Continuing	Continuing	0.000
AVCAD - PM/MS S - Program Management	MIPR	Various : N/A	-	0.000		1.808	Nov 2022	1.159	Nov 2023	-		1.159	Continuing	Continuing	0.000
CB WEARABLES-ENBD - PM/MS C - Program Management	MIPR	Various : N/A	-	0.000		3.676	Jan 2023	4.686	Dec 2023	-		4.686	Continuing	Continuing	0.000
CSIRP - PM/MS C - PM/MS S Program Management Support	Various	Various : N/A	-	0.000		1.272	Jan 2023	2.480	Jan 2024	-		2.480	Continuing	Continuing	0.000
CVCAD - PM/MS C - Program Management Support	MIPR	Various : N/A	-	0.000		0.034	Dec 2022	1.800	Oct 2023	-		1.800	Continuing	Continuing	0.000

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Chemical and Biological Defense Program **Date:** March 2023

Appropriation/Budget Activity 0400 / 5	R-1 Program Element (Number/Name) PE 0604384BP / Chemical and Biological Defense Program - EMD	Project (Number/Name) UN5 / Understand (SDD)
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Management Services (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
DBPAP - PM/MS C - Product Management Contractor Support	SS/FFP	Various : N/A	-	0.000		1.163	Mar 2023	0.000		-		0.000	0.000	1.163	0.000
FFBS - PM/MS C - Program management	Various	Various : N/A	-	0.000		0.000		0.248	Nov 2023	-		0.248	Continuing	Continuing	0.000
JBTDS - Program Management	MIPR	Various : N/A	-	0.000		0.169	Mar 2023	0.938	Jan 2024	-		0.938	Continuing	Continuing	0.000
MFK - PM/MS S - Program Management Office Support	MIPR	TBD : N/A	-	0.000		0.000		0.541	Oct 2023	-		0.541	Continuing	Continuing	0.000
MPCAD - PM/MS S - Program Management Support	MIPR	Various : N/A	-	0.000		0.200	Nov 2022	0.785	Nov 2023	-		0.785	Continuing	Continuing	0.000
NBCRV SSU - PM/MS C - Program Management Support	Various	Various : N/A	-	0.000		1.692	Jan 2023	3.311	Jan 2024	-		3.311	Continuing	Continuing	0.000
NGDS 2 CHEMDX - PM/MS S - Management Services	Various	Various : N/A	-	0.000		0.477	Dec 2022	0.859	Dec 2023	-		0.859	Continuing	Continuing	0.000
NGDS 2 MPDS - PM/MS S - Management Services	Various	Various : N/A	-	0.000		0.649	Dec 2022	2.129	Dec 2023	-		2.129	Continuing	Continuing	0.000
SPCHAR-ENBD - PM/MS C - Program Management	MIPR	Various : N/A	-	0.000		0.400	Jan 2023	0.000		-		0.000	0.000	0.400	0.000
SPU RCDD - PM/MS C - Program Management Support	Various	Various : N/A	-	0.000		0.986	Dec 2022	0.976	Dec 2023	-		0.976	Continuing	Continuing	0.000
Subtotal			-	0.000		12.615		20.154		-		20.154	Continuing	Continuing	N/A

	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract	
Project Cost Totals		-	0.000	126.071	182.726	-	182.726	Continuing	Continuing	N/A

Remarks

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Exhibit R-4, RDT&E Schedule Profile: PB 2024 Chemical and Biological Defense Program **Date:** March 2023

Appropriation/Budget Activity 0400 / 5	R-1 Program Element (Number/Name) PE 0604384BP / <i>Chemical and Biological Defense Program - EMD</i>	Project (Number/Name) UN5 / <i>Understand (SDD)</i>
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FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027				FY 2028			
1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4

AET DEFENSE - Technology Assessments/ Systems Engineering																												
AVCAD - EMD Contract																												
AVCAD - MS C-Milestone C																												
AVCAD - LRIP-Low Rate Initial Production																												
AVCAD - FRP-Full Rate Production Decision																												
AVCAD - IOC-Initial Operational Capability																												
CB WEARABLES-ENBD - Capability Development Document (CDD)																												
CB WEARABLES-ENBD - Software Development & Integration																												
CSIRP - Test and Evaluation of Prototypes - Development Objectives Strategy #1																												
CSIRP - Transition Decision - Development Objectives Strategy #1																												
CSIRP - OTA Award and Execution for Development Objectives Strategy #2																												
CSIRP - Test and Evaluation of Prototypes - Development Objectives Strategy #2																												
CSIRP - Transition Decision - Development Objectives Strategy #2																												
CSIRP - OTA Award and Execution for Development Objectives Strategy #3																												
CSIRP - Test and Evaluation of Prototypes - Development Objectives Strategy #3																												
CVCAD - CDD Validation-Capability Development Document Validation																												

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Exhibit R-4, RDT&E Schedule Profile: PB 2024 Chemical and Biological Defense Program **Date:** March 2023

Appropriation/Budget Activity 0400 / 5	R-1 Program Element (Number/Name) PE 0604384BP / <i>Chemical and Biological Defense Program - EMD</i>	Project (Number/Name) UN5 / <i>Understand (SDD)</i>
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	FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027				FY 2028			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
CVCAD - MS B-Milestone B																												
CVCAD - CDR-Critical Design Review																												
CVCAD - CDD Update																												
CVCAD - MS C-Milestone C																												
CVCAD - LRIP-Low Rate Initial Production																												
CVCAD - FRP-Full Rate Production Decision																												
CVCAD - IOC-Initial Operational Capability																												
CVCAD - FOC-Full Operational Capability																												
DBPAP - Acquire and Distribute Quality Select Biological Reference Materials and Assays while Storing and Analyzing Related Data																												
DBPAP-ENBD - Expansion of Site Locations for Sequencing Capabilities																												
DBPAP-ENBD - Expanding the Repository of Collected Biothreat Genomic Information																												
DBPAP-ENBD - Data Compression/Decompression Capabilities																												
DBPAP-ENBD - Expansion of Biorepository																												
DBPAP-ENBD - Maintain Information Storage Capabilities																												
FFBS - CDD Validation-Capability Development Document Validation																												
FFBS - PDR-Preliminary Design Review																												
FFBS - OT&E-Operational Test and Evaluation																												
FFBS - CDR-Critical Design Review																												
FFBS - BD-Build Decision																												
FFBS - FDD-Full Deployment Decision																												

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Exhibit R-4, RDT&E Schedule Profile: PB 2024 Chemical and Biological Defense Program **Date:** March 2023

Appropriation/Budget Activity 0400 / 5	R-1 Program Element (Number/Name) PE 0604384BP / <i>Chemical and Biological Defense Program - EMD</i>	Project (Number/Name) UN5 / <i>Understand (SDD)</i>
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	FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027				FY 2028			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
FFBS - IOC-Initial Operational Capability																												
FFBS - FOC-Full Operational Capability																												
WARP - Prototype Development																												
WARP - Prototype T&E																												
WARP - Procurement & Fielding																												
JBTDS - MS C-Milestone C																												
JBTDS - LRIP Contract Award																												
JBTDS - PVT																												
JBTDS - MOT&E																												
JBTDS - FRP-Full Rate Production Decision																												
JBTDS - FRP Award																												
JBTDS - IOC-Initial Operational Capability																												
MFK - MFK User Definition workshop 1																												
MFK - CD-Capability Drop - Capability release 1																												
MFK - MFK User Definition workshop 2																												
MFK - CD-Capability Drop - Capability release 2																												
MFK - MFK User Definition workshop 3																												
MFK - CD-Capability Drop - Capability release 3																												
MFK - MFK User Definition workshop 4																												
MFK - CD-Capability Drop - Capability release 4																												
MPCAD - DT&E-Developmental Test and Evaluation - EMD Contract/LRIP contract																												

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Exhibit R-4, RDT&E Schedule Profile: PB 2024 Chemical and Biological Defense Program **Date:** March 2023

Appropriation/Budget Activity 0400 / 5	R-1 Program Element (Number/Name) PE 0604384BP / <i>Chemical and Biological Defense Program - EMD</i>	Project (Number/Name) UN5 / <i>Understand (SDD)</i>
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	FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027				FY 2028			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
MPCAD - MS C-Milestone C - Liquid / Solid MS C							■																					
MPCAD - LRIP-Low Rate Initial Production							■	■	■	■	■	■																
MPCAD - MS C-Milestone C - Vapor / Quant MS C											■																	
MPCAD - FRP-Full Rate Production Decision												■																
MPCAD - IOC-Initial Operational Capability																								■				
MPCAD - FOC-Full Operational Capability																												■
NBCRV SSU - Component Test & System Level Test 1	■	■	■	■	■	■	■	■	■	■	■	■																
NBCRV SSU - Modification Work Order IPR							■	■	■	■	■	■																
NBCRV SSU - Design and Fabrication Phase 3 (CS2.2)											■	■	■	■	■	■												
NBCRV SSU - Limited User Test (LUT)								■	■	■	■	■																
NBCRV SSU - Design and Fabrication Phase 2 (CS2.1)	■	■	■	■																								
NBCRV SSU - Initial Operational Test and Evaluation (IOT&E)																■	■	■	■	■								
NBCRV SSU - FRP-Full Rate Production Decision																				■	■	■	■	■				
NGDS 2 CHEMDX - MS B-Milestone B	■	■	■	■																								
NGDS 2 CHEMDX - EMD							■	■	■	■	■	■	■	■	■	■												
NGDS 2 CHEMDX - MS C-Milestone C																■	■	■	■	■								
NGDS 2 MPDS - EMD	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■								
NGDS 2 MPDS - MS C-Milestone C - LRIP																■	■	■	■	■								
NGDS 2 MPDS - FRP-Full Rate Production Decision																				■	■	■	■	■				

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Exhibit R-4, RDT&E Schedule Profile: PB 2024 Chemical and Biological Defense Program **Date:** March 2023

Appropriation/Budget Activity 0400 / 5	R-1 Program Element (Number/Name) PE 0604384BP / <i>Chemical and Biological Defense Program - EMD</i>	Project (Number/Name) UN5 / <i>Understand (SDD)</i>
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	FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027				FY 2028			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
SPCHAR-ENBD - Pathogenicity Studies																												
SPU RCDD - Modernize CBRN Materiel																												
SPU RCDD - Develop Modular Self Contained Breathing Apparatus (MSCBA)																												
SPU RCDD - Develop Enhanced Warfighter Augmented Training (EWAT)																												
SPU RCDD - Prototype Novel CBRN Equipment																												
SPU RCDD - Develop Low Temperature Plasma Mass Spectrometer (LTPMS)																												
SPU RCDD - Develop Optimized CBRN Hydration System (OCHS)																												
SPU RCDD - Develop Assault Respirator																												
SPU RCDD - Develop USSOCOM-specific UGV/UAS Sensor Integration																												

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Chemical and Biological Defense Program		Date: March 2023
Appropriation/Budget Activity 0400 / 5	R-1 Program Element (Number/Name) PE 0604384BP / <i>Chemical and Biological Defense Program - EMD</i>	Project (Number/Name) UN5 / <i>Understand (SDD)</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
AET DEFENSE - Technology Assessments/Systems Engineering	1	2022	4	2028
AVCAD - EMD Contract	1	2022	2	2023
AVCAD - MS C-Milestone C	2	2023	2	2023
AVCAD - LRIP-Low Rate Initial Production	2	2023	1	2026
AVCAD - FRP-Full Rate Production Decision	1	2026	1	2026
AVCAD - IOC-Initial Operational Capability	2	2026	2	2026
CB WEARABLES-ENBD - Capability Development Document (CDD)	2	2022	2	2023
CB WEARABLES-ENBD - Software Development & Integration	2	2023	1	2026
CSIRP - Test and Evaluation of Prototypes - Development Objectives Strategy #1	1	2022	2	2023
CSIRP - Transition Decision - Development Objectives Strategy #1	3	2023	3	2023
CSIRP - OTA Award and Execution for Development Objectives Strategy #2	3	2023	3	2024
CSIRP - Test and Evaluation of Prototypes - Development Objectives Strategy #2	3	2023	3	2025
CSIRP - Transition Decision - Development Objectives Strategy #2	3	2025	3	2025
CSIRP - OTA Award and Execution for Development Objectives Strategy #3	3	2025	3	2028
CSIRP - Test and Evaluation of Prototypes -Development Objectives Strategy #3	4	2025	3	2028
CVCAD - CDD Validation-Capability Development Document Validation	3	2023	3	2023
CVCAD - MS B-Milestone B	4	2023	4	2023
CVCAD - CDR-Critical Design Review	3	2024	3	2024
CVCAD - CDD Update	3	2025	3	2025
CVCAD - MS C-Milestone C	4	2025	4	2025
CVCAD - LRIP-Low Rate Initial Production	4	2026	4	2026
CVCAD - FRP-Full Rate Production Decision	4	2027	4	2027

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Chemical and Biological Defense Program **Date:** March 2023

Appropriation/Budget Activity 0400 / 5	R-1 Program Element (Number/Name) PE 0604384BP / <i>Chemical and Biological Defense Program - EMD</i>	Project (Number/Name) UN5 / <i>Understand (SDD)</i>
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Events	Start		End	
	Quarter	Year	Quarter	Year
CVCAD - IOC-Initial Operational Capability	4	2028	4	2028
CVCAD - FOC-Full Operational Capability	4	2028	4	2028
DBPAP - Acquire and Distribute Quality Select Biological Reference Materials and Assays while Storing and Analyzing Related Data	1	2022	4	2028
DBPAP-ENBD - Expansion of Site Locations for Sequencing Capabilities	1	2023	4	2028
DBPAP-ENBD - Expanding the Repository of Collected Biothreat Genomic Information	1	2023	4	2028
DBPAP-ENBD - Data Compression/Decompression Capabilities	1	2023	4	2028
DBPAP-ENBD - Expansion of Biorepository	1	2023	4	2028
DBPAP-ENBD - Maintain Information Storage Capabilities	1	2023	4	2028
FFBS - CDD Validation-Capability Development Document Validation	3	2022	3	2022
FFBS - PDR-Preliminary Design Review	3	2024	3	2024
FFBS - OT&E-Operational Test and Evaluation	2	2025	2	2025
FFBS - CDR-Critical Design Review	3	2025	3	2025
FFBS - BD-Build Decision	4	2025	4	2025
FFBS - FDD-Full Deployment Decision	4	2025	4	2025
FFBS - IOC-Initial Operational Capability	4	2026	4	2026
FFBS - FOC-Full Operational Capability	4	2027	4	2027
WARP - Prototype Development	1	2024	3	2024
WARP - Prototype T&E	3	2024	1	2025
WARP - Procurement & Fielding	1	2025	4	2026
JBTDs - MS C-Milestone C	3	2023	3	2023
JBTDs - LRIP Contract Award	4	2023	4	2023
JBTDs - PVT	3	2024	3	2024
JBTDs - MOT&E	4	2024	4	2024
JBTDs - FRP-Full Rate Production Decision	4	2025	4	2025
JBTDs - FRP Award	4	2025	4	2025

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Chemical and Biological Defense Program **Date:** March 2023

Appropriation/Budget Activity 0400 / 5	R-1 Program Element (Number/Name) PE 0604384BP / <i>Chemical and Biological Defense Program - EMD</i>	Project (Number/Name) UN5 / <i>Understand (SDD)</i>
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Events	Start		End	
	Quarter	Year	Quarter	Year
JBTDS - IOC-Initial Operational Capability	2	2028	2	2028
MFK - MFK User Definition workshop 1	2	2024	2	2024
MFK - CD-Capability Drop - Capability release 1	1	2026	1	2026
MFK - MFK User Definition workshop 2	2	2025	2	2025
MFK - CD-Capability Drop - Capability release 2	1	2027	1	2027
MFK - MFK User Definition workshop 3	2	2026	2	2026
MFK - CD-Capability Drop - Capability release 3	1	2028	1	2028
MFK - MFK User Definition workshop 4	2	2027	2	2027
MFK - CD-Capability Drop - Capability release 4	1	2029	1	2029
MPCAD - DT&E-Developmental Test and Evaluation - EMD Contract/LRIP contract	1	2022	3	2024
MPCAD - MS C-Milestone C - Liquid / Solid MS C	3	2023	3	2023
MPCAD - LRIP-Low Rate Initial Production	3	2023	3	2024
MPCAD - MS C-Milestone C - Vapor / Quant MS C	2	2024	2	2024
MPCAD - FRP-Full Rate Production Decision	4	2024	4	2024
MPCAD - IOC-Initial Operational Capability	4	2027	4	2027
MPCAD - FOC-Full Operational Capability	4	2028	4	2028
NBCRV SSU - Component Test & System Level Test 1	1	2022	1	2024
NBCRV SSU - Modification Work Order IPR	3	2023	3	2024
NBCRV SSU - Design and Fabrication Phase 3 (CS2.2)	1	2024	1	2025
NBCRV SSU - Limited User Test (LUT)	4	2023	1	2024
NBCRV SSU - Design and Fabrication Phase 2 (CS2.1)	1	2022	2	2022
NBCRV SSU - Initial Operational Test and Evaluation (IOT&E)	1	2026	2	2026
NBCRV SSU - FRP-Full Rate Production Decision	3	2026	3	2026
NGDS 2 CHEMDX - MS B-Milestone B	1	2022	1	2022
NGDS 2 CHEMDX - EMD	1	2023	2	2025

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Chemical and Biological Defense Program **Date:** March 2023

Appropriation/Budget Activity 0400 / 5	R-1 Program Element (Number/Name) PE 0604384BP / <i>Chemical and Biological Defense Program - EMD</i>	Project (Number/Name) UN5 / <i>Understand (SDD)</i>
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Events	Start		End	
	Quarter	Year	Quarter	Year
NGDS 2 CHEMDX - MS C-Milestone C	2	2025	2	2025
NGDS 2 MPDS - EMD	1	2022	1	2026
NGDS 2 MPDS - MS C-Milestone C - LRIP	2	2025	2	2025
NGDS 2 MPDS - FRP-Full Rate Production Decision	2	2026	2	2026
SPCHAR-ENBD - Pathogenicity Studies	1	2023	2	2024
SPU RCDD - Modernize CBRN Materiel	1	2022	4	2027
SPU RCDD - Develop Modular Self Contained Breathing Apparatus (MSCBA)	1	2022	4	2024
SPU RCDD - Develop Enhanced Warfighter Augmented Training (EWAT)	1	2022	4	2024
SPU RCDD - Prototype Novel CBRN Equipment	1	2022	4	2027
SPU RCDD - Develop Low Temperature Plasma Mass Spectrometer (LTPMS)	1	2022	4	2024
SPU RCDD - Develop Optimized CBRN Hydration System (OCHS)	1	2022	2	2023
SPU RCDD - Develop Assault Respirator	1	2022	4	2023
SPU RCDD - Develop USSOCOM-specific UGV/UAS Sensor Integration	1	2022	4	2023

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Chemical and Biological Defense Program **Date:** March 2023

Appropriation/Budget Activity 0400 / 5	R-1 Program Element (Number/Name) PE 0604384BP / <i>Chemical and Biological Defense Program - EMD</i>	Project (Number/Name) PT5 / <i>Protect (SDD)</i>
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COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
PT5: <i>Protect (SDD)</i>	-	0.000	87.923	97.975	0.000	97.975	69.858	66.259	52.871	67.776	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Protect System Development & Demonstration (SDD) Project enhances mission performance and provides effective protection against current and emerging threats by rapidly developing and fielding modernized protection capabilities. Developmental efforts focus on advances in materials and systems engineering to enhance protective properties against a broader array of hazards, while reducing Countering Weapons of Mass Destruction (CWMD) operational challenges and logistical burdens. Developmental efforts focus on advanced medical countermeasures that provide safe and effective medical defenses against biological agents (bacteria, toxins, and viruses), emerging infectious diseases, and chemical agents. In FY 2023, the Chemical Biological Defense Program (CBDP) RDT&E Projects were restructured to align with the CBDP portfolio construct. PT5 efforts in FY 2022 remain in Projects IP5 and MB5. This restructuring provided standardization and alignment across CBDP research, development and acquisition efforts.

Efforts included in this Project are:

- (1) Advanced System for Protection and Integrated Reduction of Encumbrances (ASPIRE)
- (2) ASPIRE-Enhanced Biodefense (ASPIRE-ENBD)
- (3) Botulinum Monoclonal Antibodies (BOT MAB)
- (4) Collective Protection Conex-Enhanced Biodefense (COL PRO CONEX-ENBD)
- (5) Portable Biocontainment Patient Transport System-Enhanced Biodefense (PPTS-ENBD)
- (6) Shipboard Isolation System (SIS)
- (7) Uniform Integrated Protection Ensemble Family of Systems Air (UIPE FOS AIR)
- (8) UIPE FOS General Purpose (UIPE FOS GP)
- (9) UIPE FOS Gloves (UIPE FOS GLOVES)
- (10) Special Immunizations Program (VAC SIP)
- (11) Rapid Access to Products in Development (RAPID)

The Advanced System for Protection and Integrated Reduction of Encumbrances (ASPIRE) program allows near normal operations in a CBRN environment by minimizing or eliminating physical and psychological burden and increasing Warfighter lethality. The ASPIRE program will provide respiratory and ocular protection against CBRN threats. Multiple weapons system sights and enabling equipment are taking away space on the warfighter required to make existing protective masks work. Without this program we will be five to ten years late to need as this trend continues. The program will provide the capability to incorporate upgrades into the current ground masks to improve the suit hood/mask interface with Uniform Integrated Protective Ensemble Family of Systems General Purpose (UIPE FoS GP). In addition, this program, in conjunction with work by Joint Science and Technology Office (JSTO), will lay out the strategy and path forward required to minimize the burden to the warfighter while still providing respiratory and ocular protection against chemical, biological, radiological and nuclear agents. In FY24 the program will

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Chemical and Biological Defense Program	Date: March 2023
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Appropriation/Budget Activity 0400 / 5	R-1 Program Element (Number/Name) PE 0604384BP / <i>Chemical and Biological Defense Program - EMD</i>	Project (Number/Name) PT5 / <i>Protect (SDD)</i>
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initiate optimization of the current ground mask systems to address suit hood/mask interface and conduct prototype build and evaluation of suit hood/mask interface improvements into current ground masks for down selection and refinement.

Advanced System for Protection and Integrated Reduction of Encumbrances - Enhanced Biodefense (ASPIRE-ENBD), a new start program in FY24, supports unencumbering warfighters and revolutionizing respiratory and ocular protection against Chemical, Biological, Radiological and Nuclear (CBRN) threats, including protection from biological, toxic industrial chemicals, and other emerging threats. ASPIRE-ENBD provides a revolutionary new capability to address interface issues with new and emerging equipment. ASPIRE-ENBD will unencumber the warfighter while still providing respiratory and ocular protection against biological agents, provide durable and extended wear capability, and incorporate anti-microbial materials to develop a reusable respirator. The solution will be optimized to minimize impact on the wearer's performance to continue lethality in Biological environment by reducing burden, improving filtration capability, utilizing powered and supplied air systems as required, and integrate with existing and future equipment that cannot be integrated with current mask systems. ASPIRE-ENBD will provide a revolutionized capability to the Services for the next generation of respiratory and ocular protection. The ASPIRE-ENBD effort will develop half masks/bio-masks that are low-burden, provide protection against bio threats, and are designed as a reusable system with modularity and/or scalability for additional ocular protection. In FY24, the ASPIRE-ENBD program will initiate bio mask prototype development and evaluation.

The Botulinum Monoclonal Antibodies (BOT MAB) program will develop and deliver Food and Drug Administration (FDA) approved Botulinum Monoclonal Antibodies to the warfighter. The BOT MAB will be a monoclonal antibody cocktail that protects warfighter against exposure to botulinum toxins A and B, which is the most lethal toxin known to man. Defense against this toxin is a known gap in defense to the warfighter. This product will do large scale Good Manufacturing Practices (GMP) in the DoD Advanced Development Manufacturing (ADM) facility. This is a transition from Science and Technology (S&T).

Collective Protection CONEX Enhanced Biodefense (COL PRO CONEX-ENBD), a new start program in FY24, will provide a negative pressure shelter system for medical treatment of biologically contaminated patients in an Army field hospital environment. The Bio-Containment Shelter provides an isolation area to treat infectious personnel while preventing spread of the infection to other personnel. It is a modification of a standard two-side expandable International Standards Organization (ISO) shelter that integrates negative pressure containment systems that can be deployed with existing Army field hospitals to provide an isolation capability to Army field hospitals. In FY25, COL PRO CONEX will complete concept design, system planning and conduct an initial concept demonstration.

Portable Patient Transport System-Enhanced Biodefense (PPTS-ENBD), a new start program in FY24, is a patient transport system that enables safe transport of asymptomatic, symptomatic, or infected patients while ensuring that the medical attending personnel and platform crew members are protected from exposure. In FY25, PPTS ENBD will Begin system test and evaluation and develop logistics products.

Shipboard Isolation System (SIS) program is a new start in FY24, and will develop a kitted system that provides U.S. Navy ships the capability to setup an area to effectively isolate patients infected (or suspected of infection) with biological organisms or infectious disease. The SIS also allows medical staff to safely monitor and treat patients, and when necessary, provides a capability to safely evacuate patients off the ship. As a result, the spread of infectious disease among the crew will be minimized and the impact to mission readiness will be reduced significantly. Centers for Disease Control and Prevention (CDC) and DoD requirements for isolation and quarantine will be incorporated into the design of the SIS. In FY24, SIS will begin system planning and prototype development.

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Chemical and Biological Defense Program **Date:** March 2023

Appropriation/Budget Activity 0400 / 5	R-1 Program Element (Number/Name) PE 0604384BP / <i>Chemical and Biological Defense Program - EMD</i>	Project (Number/Name) PT5 / <i>Protect (SDD)</i>
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The Uniform Integrated Protection Ensemble (UIPE) Family of Systems (FoS) Air program will provide the Warfighter percutaneous protection from operationally relevant traditional and non-traditional Chemical, Biological, Radiological, Nuclear (CBRN) threats. UIPE FoS Air will improve aircrew performance and survivability under CBRN conditions by reducing thermal burden and bulk, while increasing mobility and resulting in an increase operational effectiveness. The UIPE FoS Air is composed of two variants. The UIPE FoS Air Chemical, Biological, Radiological Layer (CBRL) to address the specific requirements of the United States Air Force (USAF) tactical/ejection fixed wing platforms and the Two Piece Undergarment (2PUG) to address the remaining USAF and United States Navy / United States Marine Corps tactical/ejection seat (rotary wing) and non-ejection (fixed wing) platforms. In FY23, UIPE FoS Air will finalize Engineering, Manufacturing and Developmental (EMD) testing and conduct integration testing on 40+ USAF, USN, and USMC platforms for airworthiness, safe to fly and final flight clearance. FY23 is last year of BA5 funding, program is transitioning to production.

The Uniform Integrated Protective Ensemble Family of Systems General Purpose (UIPE FoS GP) is part of a family of systems that will give the Warfighter percutaneous protection from operationally relevant traditional, non-traditional, and advanced Chemical, Biological, Radiological and Nuclear (CBRN)/Toxic Industrial Material (TIM) threats likely to be encountered during joint force operations. The legacy chemical biological garment is nearing the end of its service life and does not meet updated requirements such as emerging threats, aerosol protection, and flame resistance. The UIPE FoS GP is a two-piece lightweight (compared to the legacy system) duty uniform replacement that has an aerosol liner, is flame resistant, and does not reduce Warfighter effectiveness in the areas of mobility and thermal burden. In FY24, program will conduct a Multi Service Operational Test and Evaluation (MOT&E) and continue low rate production. FY24 is last year of BA5 funding, program is transitioning to Production.

Uniform Integrated Protective Ensemble (UIPE) Family of Systems (FoS) Gloves provides percutaneous protection to the hand and wrist interface of the warfighter against traditional and non-traditional Chemical, Biological, Radiological and Nuclear (CBRN) threats. UIPE FoS Gloves will provide improved comfort, tactility and dexterity and for certain mission profiles enhanced touch screen and flame resistant capability. The UIPE FoS Gloves will be developed using a Middle Tier Acquisition (MTA) approach. In FY24, the UIPE FoS Gloves program will conduct developmental testing and complete prototype development on multiple mission profiles (General Purpose, Aviation Heavy and Aviation Light). Conduct operational testing on prototypes for the multiple mission profiles.

The Special Immunizations Program (VAC SIP) restructures to the Rapid Access to Products in Development (RAPID) program in FY24. VAC SIP continually manages, updates, and executes the Investigational New Drugs (INDs) of selected prophylaxis, treatments and diagnostics development products which provide additional protection to individuals that are at high risk of exposure to CBRN agents. DoD has the mission to maintain IND vaccines in Good Manufacturing Practice (GMP) storage and to conduct the periodic potency and stability testing of these materials to support submissions to the U.S. Food & Drug Administration (FDA).

RAPID (Rapid Access to Products in Development) an FY24 restructure of the VAC SIP program, will allow access to prototype medical countermeasures that are being developed to differential states of readiness by storing and maintaining data packages and doses of countermeasures to enable Interim Fielding Capability (IFC), retargeting, or continued development as a Program of Record. RAPID will employ a tiered system to increase clarity of each Medical Countermeasures (MCMs) state of development and how quickly/costly it will be to achieve IFC.

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2022	FY 2023	FY 2024
Title: 1) ASPIRE	-	-	4.776

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Chemical and Biological Defense Program		Date: March 2023
Appropriation/Budget Activity 0400 / 5	R-1 Program Element (Number/Name) PE 0604384BP / <i>Chemical and Biological Defense Program - EMD</i>	Project (Number/Name) PT5 / <i>Protect (SDD)</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2022	FY 2023	FY 2024
<p>Description: Development of Advanced System for Protection and Integrated Reduction of Encumbrances (ASPIRE) to provide the warfighter respiratory and ocular protection against CBRN threats.</p> <p>FY 2024 Plans: Initiate optimization of the current ground mask systems to address suit hood/mask interface and conduct prototype build and evaluation of suit hood/mask interface improvements into current ground masks for down selection and refinement.</p> <p>FY 2023 to FY 2024 Increase/Decrease Statement: Program/project funding transferred from another funding line. Program is a continuation of the ASPIRE - ENBD program.</p>			
<p>Title: 2) ASPIRE-ENBD</p> <p>Description: This effort will focus on Low Burden Half Mask</p> <p>FY 2024 Plans: Initiate bio mask/half-mask prototype development and evaluation for down selection and refinement.</p> <p>FY 2023 to FY 2024 Increase/Decrease Statement: Additional investment in enhanced biodefense and pandemic preparedness.</p>	-	-	1.600
<p>Title: 3) BOT MAB</p> <p>Description: Manufacturing</p> <p>FY 2023 Plans: Continue large scale Good Manufacturing Practices (GMP) and execute product/process characterization and validation required.</p> <p>FY 2024 Plans: Complete large scale GMP manufacturing and initiate Process Qualification runs for final drug product.</p> <p>FY 2023 to FY 2024 Increase/Decrease Statement: Decrease due to change in program/project technical parameters. Decrease is due to completion of large scale GMP manufacturing in FY24 and scale of Process Qualification runs reduced based on reduced procurement in future years.</p>	-	36.504	16.528
<p>Title: 4) BOT MAB</p> <p>Description: Clinical and Nonclinical Studies</p> <p>FY 2023 Plans:</p>	-	27.000	48.000

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Chemical and Biological Defense Program		Date: March 2023		
Appropriation/Budget Activity 0400 / 5	R-1 Program Element (Number/Name) PE 0604384BP / <i>Chemical and Biological Defense Program - EMD</i>	Project (Number/Name) PT5 / <i>Protect (SDD)</i>		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2022	FY 2023	FY 2024
<p>Obtain results from the Phase 2 clinical trial and along with the pivotal animal studies and initiate Phase 3 clinical study, and continue manufacturing for Process Performance Qualification (PPQ) lots to support clinical study and Initial Operational Capability (IOC).</p> <p>FY 2024 Plans: Complete large scale Good Manufacturing Practices (GMP) manufacturing and initiate Process Qualification runs for final drug product.</p> <p>FY 2023 to FY 2024 Increase/Decrease Statement: Increase due to change in program/project technical parameters. Increase due to Phase 3 clinical trial execution increase to the number of clinical site locations to meet required enrollment and additional cost of non-human primates (NHPs) to support clinical studies.</p>				
<p>Title: 5) COL PRO CONEX-ENBD</p> <p>Description: Prototype, test and evaluate ground based biocontainment isolation systems.</p> <p>FY 2024 Plans: Complete concept design, system planning and conduct an initial concept demonstration.</p> <p>FY 2023 to FY 2024 Increase/Decrease Statement: Additional investment in enhanced biodefense and pandemic preparedness.</p>		-	-	4.600
<p>Title: 6) PPTS-ENBD</p> <p>Description: Prototype, test and evaluate Aircraft Transportable biocontainment isolation systems</p> <p>FY 2024 Plans: Begin system test and evaluation and develop logistics products.</p> <p>FY 2023 to FY 2024 Increase/Decrease Statement: Additional investment in enhanced biodefense and pandemic preparedness.</p>		-	-	5.300
<p>Title: 7) SIS</p> <p>Description: Resource the development and test and evaluation of shipboard portable infectious disease isolation kits</p> <p>FY 2024 Plans:</p>		-	-	0.976

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Chemical and Biological Defense Program		Date: March 2023		
Appropriation/Budget Activity 0400 / 5	R-1 Program Element (Number/Name) PE 0604384BP / <i>Chemical and Biological Defense Program - EMD</i>	Project (Number/Name) PT5 / <i>Protect (SDD)</i>		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2022	FY 2023	FY 2024
Begin system planning and award Countering Weapons of Mass Destruction Other Transaction Authority (CWMD OTA) Prototype Contract.				
FY 2023 to FY 2024 Increase/Decrease Statement: Program/project is new start effort in FY 2024.				
Title: 8) UIPE FOS AIR		-	5.132	-
Description: Test and Integration of the 2 Piece Undergarment (2PUG)				
FY 2023 Plans: Finalize EMD testing and conduct integration testing on 40+ USAF, USN, and USMC platforms for airworthiness, safe to fly and final flight clearance.				
FY 2023 to FY 2024 Increase/Decrease Statement: Program/project transitioned to Production and Deployment Phase. FY23 is last year of BA5 funding, program is transitioning to production.				
Title: 9) UIPE FOS GP		-	9.640	7.052
Description: Development of the next generation protective ensembles.				
FY 2023 Plans: Conduct System Verification Review, complete MOT&E, award production contract, and conduct Production Verification Testing (PVT).				
FY 2024 Plans: Conduct Multi Service Operational Test and Evaluation (MOT&E) and evaluate program cost reduction material alternatives.				
FY 2023 to FY 2024 Increase/Decrease Statement: Program/project transitioned to Production and Deployment Phase.				
Title: 10) UIPE FOS GLOVES		-	2.699	3.856
Description: Development of the Next Generation Protective Glove				
FY 2023 Plans:				

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Chemical and Biological Defense Program **Date:** March 2023

Appropriation/Budget Activity 0400 / 5	R-1 Program Element (Number/Name) PE 0604384BP / <i>Chemical and Biological Defense Program - EMD</i>	Project (Number/Name) PT5 / <i>Protect (SDD)</i>
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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2022	FY 2023	FY 2024
<p>Continue to conduct prototype development on multiple prototypes for multiple mission profiles (General Purpose, Aviation Heavy and Aviation Light). Conduct testing such as tactility, dexterity, chemical protection, flame resistance, wear trials, and interoperability will be conducted as well as analytical framework analysis and down-selects.</p> <p>FY 2024 Plans: Conduct developmental testing, complete prototype development on multiple mission profiles (General Purpose, Aviation Heavy and Aviation Light) and conduct operational testing on prototypes for the multiple mission profiles.</p> <p>FY 2023 to FY 2024 Increase/Decrease Statement: Increase due to accelerated development effort. Funding increase supports Middle Tier Acquisition strategy research and development efforts.</p>			
<p>Title: 11) VAC SIP</p> <p>Description: Storage, Distribution, Potency Testing</p> <p>FY 2023 Plans: Continue storage, distribution, potency testing, and biosurety compliance activities in support of the Special Immunization Program closure.</p> <p>FY 2023 to FY 2024 Increase/Decrease Statement: Program/project funding transferred to another funding line. FY 2024 funding moves to RAPID Project PT5.</p>	-	6.948	-
<p>Title: 12) RAPID</p> <p>Description: Storage, Testing</p> <p>FY 2024 Plans: Initiate RAPID storage and stability testing by leveraging existing Accelerated Antibodies-Enhanced Biodefense (AA-ENBD), Vaccine Acceleration by Modular Progression-Enhanced Biodefense (VAMP-ENBD), RAIDR, and Generative Unconstrained Intelligent Drug Engineering-Enhanced Biodefense (GUIDE-ENBD) program data packages and prototype doses; Design and build a RAPID database that will be the interface for Department of Defense stakeholders for key data associated with the status and availability of medical countermeasures in development.</p> <p>FY 2023 to FY 2024 Increase/Decrease Statement: Program/project funding transferred from another funding line. VAC SIP transfers to RAPID starting in FY24.</p>	-	-	5.287
Accomplishments/Planned Programs Subtotals	-	87.923	97.975

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Chemical and Biological Defense Program **Date:** March 2023

Appropriation/Budget Activity 0400 / 5	R-1 Program Element (Number/Name) PE 0604384BP / Chemical and Biological Defense Program - EMD	Project (Number/Name) PT5 / Protect (SDD)
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C. Other Program Funding Summary (\$ in Millions)

Line Item	FY 2022	FY 2023	FY 2024	FY 2024	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028	Cost To	
			Base	OCO	Total					Complete	Total Cost
• IP4: Individual Protection (ACD&P)	4.748	-	-	-	-	-	-	-	-	0.000	4.748
• IP5: Individual Protection (SDD)	18.690	-	-	-	-	-	-	-	-	0.000	18.690
• MB5: Medical Biological Defense (SDD)	138.156	-	-	-	-	-	-	-	-	0.000	138.156
• PT4: Protect (ACD&P)	-	175.219	179.158	-	179.158	135.096	107.341	123.538	139.376	Continuing	Continuing
• JP1111: Joint Expeditionary Collective Protection (JECF)	22.719	30.737	-	-	-	3.000	3.750	-	-	Continuing	Continuing
• PHM032: Uniform Integrated Protective Ensemble FOS Gloves (UIPE FOS GLOVES)	-	-	4.978	-	4.978	6.215	7.974	8.328	8.926	Continuing	Continuing
• PHM033: Uniform Integrated Protective Ensemble General Purpose (UIPE FOS GP)	4.456	30.145	55.100	-	55.100	111.350	111.783	112.106	113.401	Continuing	Continuing
• PHM034: Uniform Integrated Protection Ensemble FOS Air (UIPE FOS AIR)	47.798	23.407	25.794	-	25.794	26.195	26.403	17.586	0.492	Continuing	Continuing
• PHM039: Botulinum Monoclonal Antibodies (BOT MAB)	-	-	-	-	-	-	33.601	-	-	Continuing	Continuing
• PHM044: Uniform Integrated Protective Ensemble FOS Footwear (UIPE FOS FOOTWEAR)	-	-	-	-	-	-	-	6.354	10.954	Continuing	Continuing

Remarks

D. Acquisition Strategy

ADVANCED SYSTEM FOR PROTECTION AND INTEGRATED REDUCTION OF ENCUMBRANCES (ASPIRE)

Efforts for the suit hood/mask interface improvements into current ground masks will be accomplished through the Countering Weapons of Mass Destruction Other Transaction Authority (CWMD OTA) and current Joint Service General Purpose Mask (JSGPM) M53A1 contract. Efforts for the ASPIRE next generation respirator will be accomplished by awarding an agreement through the CWMD OTA to procure multiple prototypes for further development and evaluation to select down to a final solution.

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Chemical and Biological Defense Program		Date: March 2023
Appropriation/Budget Activity 0400 / 5	R-1 Program Element (Number/Name) PE 0604384BP / <i>Chemical and Biological Defense Program - EMD</i>	Project (Number/Name) PT5 / <i>Protect (SDD)</i>
ADVANCED SYSTEM FOR PROTECTION AND INTEGRATED REDUCTION OF ENCUMBRANCES-ENHANCED BIODEFENSE (ASPIRE-ENBD) Efforts will be accomplished by awarding an agreement through the Countering Weapons of Mass Destruction Other Transaction Authority (CWMD OTA) to develop multiple prototypes for evaluation and further refinement.		
BOTULINUM MONOCLONAL ANTIBODIES (BOT MAB) The Botulinum Monoclonal Antibodies (BOT MAB) program acquisition strategy supports the development of Pre-Exposure Prophylaxis (PrEP) through the Engineering, Manufacturing and Development (EMD) phase against the Botulinum Neuro Toxin (BoNT). This Medical Countermeasure (MCM) will prevent and reduce the incidence or progression of botulism disease, following exposure to BoNT serotypes A and B. The overall regulatory approach of the program remains to pursue development for Food and Drug Administration (FDA) approval under the Animal Rule.		
COLLECTIVE PROTECTION CONEX-ENHANCED BIODEFENSE (COL PRO CONEX-ENBD) Resource prototype system design and development through the Countering Weapons of Mass Destruction Other Transaction Agreement (CWMD OTA) contract. Prototypes will undergo evaluation and further refinement to optimize performance and minimize total ownership cost.		
PORTABLE PATIENT TRANSPORT SYSTEM-ENHANCED BIODEFENSE (PPTS-ENBD) Resource prototype system design and development through the Countering Weapons of Mass Destruction (CWMD) Other Transactional Authority (OTA) contract. Leverage lessons learned from previous efforts to optimize performance and minimize total ownership cost.		
Shipboard Isolation System The SIS program will utilize the Countering Weapons of Mass Destruction (CWMD) Other Transactional Authority (OTA) to design, procure, and test iterative prototypes to meet the shipboard isolation requirements. Once a final prototype design is selected and successfully completes testing and user evaluations, a technical data package (TDP) and logistics package will be developed. The program will culminate in the procurement and fielding of systems for ship use that will be stored at fleet concentration areas on both CONUS and OCONUS locations.		
UNIFORM INTEGRATED PROTECTION ENSEMBLE FOS AIR (UIPE FOS AIR) The Uniform Integrated Protection Ensemble (UIPE) Family of Systems (FoS) Air utilizes a streamlined acquisition strategy that identifies mature technology and capitalizes on work accomplished by the United States Air Force (USAF) Integrated Aircrew Ensemble (IAE) and UIPE FoS General Purpose (GP) programs. The UIPE FoS Air will utilize a Milestone A-C acquisition strategy that will accelerate fielding to the Warfighter. The contract strategy leveraged the USAF IAE Small Business		

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Chemical and Biological Defense Program	Date: March 2023
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Appropriation/Budget Activity 0400 / 5	R-1 Program Element (Number/Name) PE 0604384BP / <i>Chemical and Biological Defense Program - EMD</i>	Project (Number/Name) PT5 / <i>Protect (SDD)</i>
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Innovation Research (SBIR) Phase III contract to procure UIPE Air CBRL. The UIPE FoS Air 2PUG is a government owned design and as an item on the Federal Procurement List, will be produced by Source America and Ready One Industries.

UNIFORM INTEGRATED PROTECTIVE ENSEMBLE GENERAL PURPOSE (UIPE FOS GP)

The Uniform Integrated Protective Ensemble Family of Systems General Purpose (UIPE FoS GP) program used an Other Transaction Authority (OTA) and Government designed prototypes produced in conjunction with an Industry Partner to acquire prototypes for early user testing. Warfighter feedback, trade space analysis, and chemical testing resulted in three government designed candidates being down selected in 3QFY20. These three candidates are designed to minimize operational burden and provide improved form, fit, function, and integration with the current Warfighter kits compared to legacy systems. Additional testing, review of the results, stakeholder guidance, and a risk analysis led to the selection of two variants. During 3QFY22, one variant will be selected to enter the Operational Assessment and Developmental/Operational Testing. UIPE FoS GP will be executing multiple awards in the next 3 years, where production occurring before the milestone to allow for completion of UIPE evaluation (effectiveness, suitability and survivability) prior to award of a high ceiling production contract. This will allow the vendor to better estimate pricing (labor and material) with an initial production ramp up; and Mitigates schedule risk for award of a high ceiling production contract.

UNIFORM INTEGRATED PROTECTIVE ENSEMBLE FOS GLOVES (UIPE FOS GLOVES)

The Uniform Integrated Protective Ensemble (UIPE) Family of Systems (FoS) Glove program conducted market research through both Requests For Information (RFIs) and a call for White Papers through an Other Transaction Authority (OTA) contracting approach. Eight white papers were deemed acceptable and will be pursued through a Middle Tier Acquisition Rapid Prototyping strategy. Candidate technologies will undergo Early User Tests/Wear events and material and system level testing to identify available capabilities as well as Analytical framework analyses to determine the most suitable solution(s) per mission profile.

SPECIAL IMMUNIZATION PROGRAM (VAC SIP)

The SIP program manages the continual storage, testing, compliance, and distribution activities associated with Investigational New Drugs (INDs) for legacy prophylactic medical countermeasures, as well as the recent Bot and Plague vaccine candidates. Additionally, the SIP maintains interagency agreements with US Army Medical Research and Development Command to support testing and compliance requirements. This Department of Defense program supports the Federal interagency with this effort, as well as academic and industry partners.

Rapid Access to Products in Development

RAPID (Rapid Access to Products in Development) will leverage existing Chemical Biological Defense Program (CBDP) advanced development programs within the Joint Program Executive Office for Chemical, Biological, Radiological, and Nuclear Defense (JPEO-CBRND) to build a repository of medical countermeasures at tiered development stages, in order to establish a rapid response capability by providing access to products still in development and provide prototype Medical Countermeasures (MCMs) for transition to Programs of Record.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Chemical and Biological Defense Program **Date:** March 2023

Appropriation/Budget Activity 0400 / 5	R-1 Program Element (Number/Name) PE 0604384BP / Chemical and Biological Defense Program - EMD	Project (Number/Name) PT5 / Protect (SDD)
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Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
ASPIRE - HW S - Hood/Mask Interface Prototype Development	C/FFP	ATI Solutions, Inc. : Tysons Corner, VA	-	0.000		0.000		2.708	Jan 2024	-		2.708	Continuing	Continuing	0.000
ASPIRE-ENBD - HW C - Bio half-mask Prototype Development	Various	Various : N/A	-	0.000		0.000		0.700	Dec 2023	-		0.700	Continuing	Continuing	0.000
BOT MAB - SW C - BOT MONO	C/CPFF	Resilience Government Services, Inc. : Alachua, Florida	-	0.000		59.164	Dec 2022	54.011	Dec 2023	-		54.011	Continuing	Continuing	0.000
COL PRO CONEX-ENBD - HW S - Concept Design	Various	TBD : N/A,	-	0.000		0.000	Dec 2022	2.187	Nov 2023	-		2.187	Continuing	Continuing	0.000
PPTS-ENBD - HW S - Prototyping Contract	TBD	TBD : N/A	-	0.000		0.000	Dec 2022	2.461	Jan 2024	-		2.461	Continuing	Continuing	0.000
SIS - HW S - Develop Requirements and Specifications, Develop Shipboard Isolation System Concepts	TBD	TBD : N/A	-	0.000		0.000		0.481	Dec 2023	-		0.481	Continuing	Continuing	0.000
UIPE FOS AIR - HW C - Prototype Development (2PUG)	Various	Various : N/A	-	0.000		0.330	Nov 2022	0.000		-		0.000	0.000	0.330	0.000
UIPE FOS GP - HW C - Prototype Development	MIPR	TBD : N/A	-	0.000		0.839	Nov 2022	1.750	Nov 2023	-		1.750	Continuing	Continuing	0.000
UIPE FOS GLOVES - HW C - Prototype Manufacturing, Demonstration and Down-select	MIPR	Various : N/A	-	0.000		0.562	Nov 2022	0.400	Nov 2023	-		0.400	Continuing	Continuing	0.000
Subtotal			-	0.000		60.895		64.698		-		64.698	Continuing	Continuing	N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Chemical and Biological Defense Program **Date:** March 2023

Appropriation/Budget Activity 0400 / 5	R-1 Program Element (Number/Name) PE 0604384BP / <i>Chemical and Biological Defense Program - EMD</i>	Project (Number/Name) PT5 / <i>Protect (SDD)</i>
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Support (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
ASPIRE - ES C - Engineering Support	Various	Various : N/A	-	0.000		0.000		0.716	Nov 2023	-		0.716	Continuing	Continuing	0.000
ASPIRE-ENBD - ES S - Engineering and Technical Support	Various	Various : N/A	-	0.000		0.000		0.240	Nov 2023	-		0.240	Continuing	Continuing	0.000
BOT MAB - PM/MS C - BOT MONO	Various	JPEO Chem, Bio, Rad, and Nuc Defense (JPEO-CBRND) : Aberdeen Proving Ground, MD	-	0.000		4.340	Dec 2022	4.517	Dec 2023	-		4.517	Continuing	Continuing	0.000
BOT MAB - PM/MS C - BOT MONO	Various	JPL CBRND Enabling Biotechnologies, JPEO-CBRND : Fort Detrick, MD	-	0.000		0.000		6.000	Dec 2023	-		6.000	Continuing	Continuing	0.000
COL PRO CONEX-ENBD - ES S - Engineering, Logistics, Technical, IPT Support	MIPR	Various : N/A	-	0.000		0.000	Dec 2022	0.956	Nov 2023	-		0.956	Continuing	Continuing	0.000
PPTS-ENBD - ES S - Engineering, Logistics, Technical, IPT Support	MIPR	Various : N/A	-	0.000		0.000	Dec 2022	1.962	Nov 2023	-		1.962	Continuing	Continuing	0.000
SIS - ES S - Engineering, Logistics, Technical, IPT Support	TBD	TBD : N/A	-	0.000		0.000		0.150	Dec 2023	-		0.150	Continuing	Continuing	0.000
UIPE FOS AIR - ES C - Engineering and IPT Support	Various	Various : N/A	-	0.000		1.821	Nov 2022	0.000		-		0.000	0.000	1.821	0.000
UIPE FOS GP - ILS C - Integrated Log Support-System	Various	Various : N/A	-	0.000		0.608	Nov 2022	0.442	Nov 2023	-		0.442	Continuing	Continuing	0.000
UIPE FOS GP - ES C - Engineering & Technical	Various	Various : N/A	-	0.000		2.477	Nov 2022	0.610	Nov 2023	-		0.610	Continuing	Continuing	0.000

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Chemical and Biological Defense Program **Date:** March 2023

Appropriation/Budget Activity 0400 / 5	R-1 Program Element (Number/Name) PE 0604384BP / <i>Chemical and Biological Defense Program - EMD</i>	Project (Number/Name) PT5 / <i>Protect (SDD)</i>
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Support (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
IPT Support / SME Support															
UIPE FOS GLOVES - ES C - Engineering, Logistics, Technical, IPT Support	MIPR	Various : N/A	-	0.000		0.812	Nov 2022	0.578	Nov 2023	-		0.578	Continuing	Continuing	0.000
Subtotal			-	0.000		10.058		16.171		-		16.171	Continuing	Continuing	N/A

Test and Evaluation (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
ASPIRE - OTHT C - Prototype Evaluation	Various	Various : N/A	-	0.000		0.000		1.157	Nov 2023	-		1.157	Continuing	Continuing	0.000
ASPIRE-ENBD - OTHT C - Prototype Evaluation	Various	Various : N/A	-	0.000		0.000		0.562	Dec 2023	-		0.562	Continuing	Continuing	0.000
COL PRO CONEX-ENBD - DTE C - T&E Support	MIPR	Various : N/A	-	0.000		0.000	Dec 2022	1.175	Nov 2023	-		1.175	Continuing	Continuing	0.000
PPTS-ENBD - DTE S - T&E Support	MIPR	Various : N/A	-	0.000		0.000	Dec 2022	0.552	Nov 2023	-		0.552	Continuing	Continuing	0.000
SIS - DTE S - Develop T&E strategy, Provide T&E Inputs to Contract Documentation	TBD	TBD : N/A	-	0.000		0.000		0.285	Dec 2023	-		0.285	Continuing	Continuing	0.000
UIPE FOS AIR - DTE C - System Level Testing	Various	Various : N/A	-	0.000		2.587	Nov 2022	0.000		-		0.000	0.000	2.587	0.000
UIPE FOS GP - DTE C - DT/OT	Various	Various : N/A	-	0.000		5.022	Nov 2022	3.993	Nov 2023	-		3.993	Continuing	Continuing	0.000
UIPE FOS GLOVES - DTE C - Early User Testing, Developmental Testing	MIPR	Various : N/A	-	0.000		1.153	Nov 2022	2.642	Nov 2023	-		2.642	Continuing	Continuing	0.000
VAC SIP - OTHT C - Storage and Distribution of Vaccines	SS/FP	Fisher BioServices : Rockville, MD	-	0.000		1.365	Mar 2023	0.000		-		0.000	0.000	1.365	0.000

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Chemical and Biological Defense Program **Date:** March 2023

Appropriation/Budget Activity 0400 / 5	R-1 Program Element (Number/Name) PE 0604384BP / <i>Chemical and Biological Defense Program - EMD</i>	Project (Number/Name) PT5 / <i>Protect (SDD)</i>
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Test and Evaluation (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
VAC SIP - OTHT C - Potency Testing of Vaccines	MIPR	US Army Medical Research Institute of Infectious Disease (USAMRIID) : Fort Detrick, MD	-	0.000		1.196	Mar 2023	0.000		-		0.000	0.000	1.196	0.000
VAC SIP - OTHT C - Potency Testing of Vaccines	C/CPFF	Battelle Memorial Institute : Columbus, OH	-	0.000		1.642	Jan 2023	0.000		-		0.000	0.000	1.642	0.000
VAC SIP - OTHT C - BOT & PLG Stability	C/CPFF	TBD : N/A	-	0.000		2.080	Jan 2023	0.000		-		0.000	0.000	2.080	0.000
RAPID - OTHT C	TBD	Various : N/A	-	0.000		0.000		4.927	Dec 2023	-		4.927	Continuing	Continuing	0.000
Subtotal			-	0.000		15.045		15.293		-		15.293	Continuing	Continuing	N/A

Management Services (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
ASPIRE - PM/MS S - Management Support Services	Various	Various : N/A	-	0.000		0.000		0.195	Nov 2023	-		0.195	Continuing	Continuing	0.000
ASPIRE-ENBD - PM/MS C - Program Management Support	Various	Various : N/A	-	0.000		0.000		0.098	Dec 2023	-		0.098	Continuing	Continuing	0.000
COL PRO CONEX-ENBD - PM/MS S - Program Management	MIPR	Various : N/A	-	0.000		0.000	Dec 2022	0.282	Nov 2023	-		0.282	Continuing	Continuing	0.000
PPTS-ENBD - PM/MS S - Program Management	MIPR	Various : N/A	-	0.000		0.000	Dec 2022	0.325	Nov 2023	-		0.325	Continuing	Continuing	0.000
SIS - PM/MS S - Program Management Support	Various	Various : N/A	-	0.000		0.000		0.060	Dec 2023	-		0.060	Continuing	Continuing	0.000
UIPE FOS AIR - PM/MS C - Program Management Services	MIPR	Various : N/A	-	0.000		0.394	Nov 2022	0.000		-		0.000	0.000	0.394	0.000

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Exhibit R-4, RDT&E Schedule Profile: PB 2024 Chemical and Biological Defense Program **Date:** March 2023

Appropriation/Budget Activity 0400 / 5	R-1 Program Element (Number/Name) PE 0604384BP / <i>Chemical and Biological Defense Program - EMD</i>	Project (Number/Name) PT5 / <i>Protect (SDD)</i>
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	FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027				FY 2028			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
PPTS-ENBD - Concept Development and System Planning																												
PPTS-ENBD - CWMD OTA Contract Award																												
PPTS-ENBD - User Demonstrations																												
PPTS-ENBD - MOT&E																												
PPTS-ENBD - Logistics Demonstration																												
PPTS-ENBD - Technical Design Package Complete																												
PPTS-ENBD - Logistics/Sustainment Package Complete																												
PPTS-ENBD - Final Prototype Purchase Contract																												
SIS - RDP-Requirements Definition Package - Requirements Definition																												
SIS - Concept Development and System Planning																												
SIS - CWMD OTA Contract Award																												
SIS - Initial Prototype Fabrication and Delivery																												
SIS - Initial Prototype Testing																												
SIS - Modified Prototype Fabrication and Delivery																												
SIS - Modified Prototype Testing and User Demo																												
SIS - Final Prototype Fabrication and Delivery																												
SIS - Final Prototype MOT&E and Logistics Demo																												
SIS - Technical Data Package and Logistics Package																												

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Exhibit R-4, RDT&E Schedule Profile: PB 2024 Chemical and Biological Defense Program **Date:** March 2023

Appropriation/Budget Activity 0400 / 5	R-1 Program Element (Number/Name) PE 0604384BP / <i>Chemical and Biological Defense Program - EMD</i>	Project (Number/Name) PT5 / <i>Protect (SDD)</i>
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	FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027				FY 2028			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
SIS - System Fabrication and Delivery																												
UIPE FOS AIR - Aircraft Integration Testing	■	■																										
UIPE FOS AIR - Swatch and System Level Testing	■	■	■																									
UIPE FOS AIR - Fixed Wing Ejection Aircraft Integration Testing	■	■	■	■																								
UIPE FOS AIR - Fixed Wing Non-Ejection Aircraft Testing	■	■	■	■																								
UIPE FOS AIR - Rotary Wing Aircraft Integration Testing	■	■	■	■																								
UIPE FOS AIR - Prototype Development (2PUG)	■	■	■																									
UIPE FOS AIR - IOC-Initial Operational Capability - CBRL		■																										
UIPE FOS AIR - Human Factors Testing			■																									
UIPE FOS AIR - Safe to Fly Certification				■	■	■	■																					
UIPE FOS AIR - FOC-Full Operational Capability - CBRL				■																								
UIPE FOS AIR - Developmental/Operational Testing (DT/OT)	■	■	■																									
UIPE FOS AIR - Safe-to-Fly and Airworthiness Testing					■	■	■	■																				
UIPE FOS AIR - Capability Development Document (CDD) Update						■																						
UIPE FOS AIR - FRP-Full Rate Production Decision - 2PUG						■																						
UIPE FOS AIR - IOC-Initial Operational Capability - 2PUG										■																		

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Chemical and Biological Defense Program **Date:** March 2023

Appropriation/Budget Activity 0400 / 5	R-1 Program Element (Number/Name) PE 0604384BP / <i>Chemical and Biological Defense Program - EMD</i>	Project (Number/Name) PT5 / <i>Protect (SDD)</i>
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Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
ASPIRE - Suit Hood/Mask Interface Prototype Development	1	2025	4	2025
ASPIRE - Suit Hood/Mask Interface Prototype Testing and Evaluation	1	2025	3	2027
ASPIRE - Next Generation Respirator new material development	1	2027	4	2028
ASPIRE - Suit Hood/Mask Interface Production	3	2027	4	2028
ASPIRE-ENBD - Prototype Development	1	2024	3	2026
ASPIRE-ENBD - Prototype Testing and Evaluation	4	2024	4	2026
BOT MAB - Platform Development	1	2022	4	2025
BOT MAB - Clinical and Nonclinical	1	2022	3	2025
BOT MAB - Manufacturing	1	2022	4	2025
BOT MAB - MS B-Milestone B	2	2022	2	2022
BOT MAB - MS C-Milestone C	2	2023	2	2023
BOT MAB - Biologics License Application (BLA) Submission	4	2025	4	2025
COL PRO CONEX-ENBD - Concept Design and System Planning	2	2024	4	2024
COL PRO CONEX-ENBD - Initial Concept Demonstration	4	2024	4	2024
COL PRO CONEX-ENBD - Iterative Prototyping	4	2024	3	2026
COL PRO CONEX-ENBD - ILS Development	3	2025	4	2026
COL PRO CONEX-ENBD - Training Development	3	2025	4	2026
PPTS-ENBD - Concept Development and System Planning	1	2025	4	2025
PPTS-ENBD - CWMD OTA Contract Award	4	2024	4	2024
PPTS-ENBD - User Demonstrations	3	2025	4	2025
PPTS-ENBD - MOT&E	4	2026	4	2026
PPTS-ENBD - Logistics Demonstration	4	2026	4	2026

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Chemical and Biological Defense Program **Date:** March 2023

Appropriation/Budget Activity 0400 / 5	R-1 Program Element (Number/Name) PE 0604384BP / <i>Chemical and Biological Defense Program - EMD</i>	Project (Number/Name) PT5 / <i>Protect (SDD)</i>
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Events	Start		End	
	Quarter	Year	Quarter	Year
PPTS-ENBD - Technical Design Package Complete	3	2027	3	2027
PPTS-ENBD - Logistics/Sustainment Package Complete	3	2027	4	2027
PPTS-ENBD - Final Prototype Purchase Contract	4	2027	4	2027
SIS - RDP-Requirements Definition Package - Requirements Definition	1	2024	2	2024
SIS - Concept Development and System Planning	2	2024	4	2024
SIS - CWMD OTA Contract Award	4	2024	1	2026
SIS - Initial Prototype Fabrication and Delivery	2	2025	3	2025
SIS - Initial Prototype Testing	4	2025	4	2025
SIS - Modified Prototype Fabrication and Delivery	1	2026	2	2026
SIS - Modified Prototype Testing and User Demo	3	2026	4	2026
SIS - Final Prototype Fabrication and Delivery	1	2027	2	2027
SIS - Final Prototype MOT&E and Logistics Demo	3	2027	3	2027
SIS - Technical Data Package and Logistics Package	2	2027	4	2027
SIS - System Fabrication and Delivery	1	2028	4	2028
UIPE FOS AIR - Aircraft Integration Testing	1	2022	2	2022
UIPE FOS AIR - Swatch and System Level Testing	1	2022	4	2022
UIPE FOS AIR - Fixed Wing Ejection Aircraft Integration Testing	1	2022	4	2023
UIPE FOS AIR - Fixed Wing Non-Ejection Aircraft Testing	1	2022	4	2023
UIPE FOS AIR - Rotary Wing Aircraft Integration Testing	1	2022	4	2023
UIPE FOS AIR - Prototype Development (2PUG)	1	2022	4	2022
UIPE FOS AIR - IOC-Initial Operational Capability - CBRL	2	2022	2	2022
UIPE FOS AIR - Human Factors Testing	3	2022	3	2022
UIPE FOS AIR - Safe to Fly Certification	4	2022	4	2023
UIPE FOS AIR - FOC-Full Operational Capability - CBRL	4	2022	4	2022
UIPE FOS AIR - Developmental/Operational Testing (DT/OT)	1	2022	4	2022

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Chemical and Biological Defense Program **Date:** March 2023

Appropriation/Budget Activity 0400 / 5	R-1 Program Element (Number/Name) PE 0604384BP / <i>Chemical and Biological Defense Program - EMD</i>	Project (Number/Name) PT5 / <i>Protect (SDD)</i>
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Events	Start		End	
	Quarter	Year	Quarter	Year
UIPE FOS AIR - Safe-to-Fly and Airworthiness Testing	1	2023	4	2023
UIPE FOS AIR - Capability Development Document (CDD) Update	2	2023	2	2023
UIPE FOS AIR - FRP-Full Rate Production Decision - 2PUG	2	2023	2	2023
UIPE FOS AIR - IOC-Initial Operational Capability - 2PUG	2	2024	2	2024
UIPE FOS AIR - FOC-Full Operational Capability - 2PUG	4	2028	4	2028
UIPE FOS GP - TATPE Technical Testing	1	2022	2	2022
UIPE FOS GP - MS C-Milestone C - TATPE	3	2022	3	2022
UIPE FOS GP - TATPE Production Contract Award	4	2022	4	2022
UIPE FOS GP - FRP-Full Rate Production Decision - TATPE	4	2022	4	2022
UIPE FOS GP - IOC-Initial Operational Capability - TATPE	2	2024	2	2024
UIPE FOS GP - FOC-Full Operational Capability - TATPE	3	2025	3	2025
UIPE FOS GP - DT/OT	2	2022	3	2023
UIPE FOS GP - CDR-Critical Design Review	3	2022	3	2022
UIPE FOS GP - Production Initiation Contract	2	2023	2	2023
UIPE FOS GP - Operational Assessment	1	2024	1	2024
UIPE FOS GP - Manufacturing Readiness Assessment (MRA)	2	2023	2	2023
UIPE FOS GP - Joint Independent Logistics Assessment (JILA)	3	2023	4	2023
UIPE FOS GP - MS C-Milestone C	4	2023	4	2023
UIPE FOS GP - Capability Development Document (CDD) Update (if needed)	4	2023	4	2023
UIPE FOS GP - Production Contract Award	1	2025	1	2025
UIPE FOS GP - OT&E-Operational Test and Evaluation	2	2024	2	2024
UIPE FOS GP - FRP-Full Rate Production Decision	1	2026	1	2026
UIPE FOS GP - IOC-Initial Operational Capability	4	2028	4	2028
UIPE FOS GLOVES - Early User, material and system level testing	1	2022	2	2024
UIPE FOS GLOVES - Mid-Tier Acquisition Rapid Prototype Initiation	1	2022	1	2023

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Chemical and Biological Defense Program **Date:** March 2023

Appropriation/Budget Activity 0400 / 5	R-1 Program Element (Number/Name) PE 0604384BP / <i>Chemical and Biological Defense Program - EMD</i>	Project (Number/Name) PT5 / <i>Protect (SDD)</i>
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Events	Start		End	
	Quarter	Year	Quarter	Year
UIPE FOS GLOVES - Mid-Tier Acquisition DT/OT	2	2022	3	2024
UIPE FOS GLOVES - Analytical Framework Analysis	3	2022	4	2022
UIPE FOS GLOVES - Mid-Tier Acquisition IPR	3	2023	3	2023
UIPE FOS GLOVES - Mid-Tier Acquisition Decision Point	3	2024	3	2024
UIPE FOS GLOVES - Mid-Tier Acquisition Rapid Fielding OR/Milestone C	4	2024	4	2024
VAC SIP - Storage, distribution, potency testing, biosurety compliance activities	1	2022	4	2023
RAPID - DT&E-Developmental Test and Evaluation - Storage and stability testing	1	2024	4	2028

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Chemical and Biological Defense Program **Date:** March 2023

Appropriation/Budget Activity 0400 / 5	R-1 Program Element (Number/Name) PE 0604384BP / <i>Chemical and Biological Defense Program - EMD</i>	Project (Number/Name) MT5 / <i>Mitigate (SDD)</i>
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COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To	Total
											Complete	Cost
MT5: <i>Mitigate (SDD)</i>	-	0.000	74.225	88.441	0.000	88.441	92.279	91.431	87.773	93.250	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Mitigate System Development & Demonstration (SDD) Project provides the Joint Force the ability to recover from exposure to chemical and biological hazards and quickly return to the fight. Efforts include development of U.S. Food & Drug Administration (FDA) approved medical countermeasures (MCMs) to protect the lives and maintain the battle readiness of the warfighter. Efforts also provide safe, effective MCMs to enable Warfighter recovery and return to duty after exposure to chemical threat agents, and reduce logistics needs of decontamination methods with operationally-relevant test methods and allows personnel to reduce Mission-Oriented Protective Posture (MOPP) levels as rapidly as possible. Activities in this project realize considerable efficiencies through cost sharing agreements. In FY 2023, the Chemical Biological Defense Program (CBDP) RDT&E Projects were restructured to align with the CBDP portfolio construct. MT5 efforts in FY 2022 remain in Projects DE5, MB5, and MC5. This restructuring provided standardization and alignment across CBDP research, development and acquisition efforts.

Efforts included in this Project are:

- (1) Alternative Autoinjector Manufacturer Capability (AUTOINJ)
- (2) Antiviral Therapeutics Program (AV TX)
- (3) Countering Emerging Threats Rapid Acquisition and Investigation of Drugs for Repurposing (CET RAIDR)
- (4) Countering Emerging Threats Rapid Acquisition and Investigation of Drugs for Repurposing-Enhanced Biodefense (CET RAIDR-ENBD)
- (5) Decontamination Family of Systems Contamination Indicator Decontamination Assurance System (DFoS CIDAS BLISTER)
- (6) Forward Area Mobility Spray - System (FAMS-S)
- (7) Improved Nerve Agent Treatment System Centrally Acting (INATS CA)
- (8) Service Equipment Decontamination System (SEDS)

The AUTOINJ effort provides for FDA approved alternative source(s) for autoinjectors that deliver DoD nerve agent antidote and treatment capabilities to the warfighter; thereby mitigating capability fielding and operational readiness risks. This program augments legacy autoinjectors, antidote treatment nerve agent autoinjector (ATNAA), 2-PAM, and Convulsant Antidote for Nerve Agents (CANA) by providing alternative commercial sources which includes Dual Drug Delivery Device (D4), the Atropine Auto-Injector, and an anticonvulsant autoinjector. In FY24, AUTOINJ will submit New Drug Application packages to the FDA for D4 and Alternative-Diazepam, initiate activities for a wet-dry atropine autoinjector that provides an extended shelf-life compared to the fielded FDA approved Atropine Auto-Injector.

The Anti-viral Therapeutics (AV TX) program will develop and deliver a Food and Drug Administration (FDA) approved antiviral therapeutics for the warfighter. Based on the current gap in defense to the Warfighter, the initial therapeutic candidate is a treatment against the Marburg virus. Developed broad spectrum antiviral therapeutics will be employed after suspected or confirmed exposure to the relevant threat agents and AV TX Medical Countermeasures (MCM) will ameliorate the effect of threat agents to the warfighter. In the event of a natural occurring outbreak, antiviral therapeutics can be provided to ensure freedom of operation.

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The Countering Emerging Threats Rapid Acquisition and Investigation of Drugs for Repurposing (CET RAIDR) program will develop repurposed drugs as medical countermeasures towards known, potential, and emerging threats, bridging the gap from when a threat is identified until targeted countermeasures are available. CET RAIDR will leverage lessons learned to repurpose U.S. Food & Drug Administration (FDA) approved therapeutics to reduce risk to the Warfighter by providing medical countermeasures to CBRN threat symptoms. CET RAIDR will evaluate FDA-approved and/or late stage products through nonclinical Non-Human Primate (NHP) studies to repurpose as a CBRN Medical Countermeasure. Studies will generate safety and efficacy data to support the use of these tested product against CBRN threats. Efforts include additional investments in enhanced biodefense and pandemic preparedness.

The Decontamination Family of Systems (DFoS) Contamination Indicator Decontamination Assurance System (CIDAS) Blister program addresses traditional blister agents, two separate threat scenarios that require different materiel solutions, modernizing a key capability to help build a more lethal force, as outlined in the National Defense Strategy. In FY24, the program will conduct a Manufacturing Readiness Assessment (MRA) and a Physical Configuration Audit (PCA) with Prime Contractor and complete Operational Testing in support of Full Rate Production (FRP)/Fielding Decision. FY24 is last year of BA5 funding, program is transitioning to Production.

The FAMS-S will provide Special Operations Forces (SOF) and SOF Task Forces (SOTFs) with transportable, rapidly-deployable decontamination systems in three variants: man-portable, small vehicle-mounted, and large vehicle-mounted systems to rapidly decontaminate chemical and biological (CB) agents from the exterior of vehicles and support equipment to a level that is clean enough for re-use during missions without the need for donning CB personal protective equipment. This will maximize tactical flexibility and fighting strength while minimizing the logistical burden and the cost of conducting Countering Weapons of Mass Destruction (CWMD) and CB operations. FAMS-S is a Middle Tier Acquisition (MTA) program.

The INATS CA program will develop the centrally-acting anticholinergic, scopolamine, to increase survivability and decrease morbidity following exposure to toxic nerve agents. When added to currently fielded nerve agent treatments, scopolamine will improve overall medical outcomes and will be available in both a vial for use at definitive care, and in an autoinjector for use in the field. In FY24, INATS CA will continue nonclinical work to refine the efficacious dose, complete functional and environmental testing for the autoinjector, and begin manufacture of current Good Manufacturing Practice (cGMP) registration lots. Interaction with the FDA under PL115-92 will occur during nonclinical testing and autoinjector development.

The Joint Service Equipment Decontamination System (SEDS) and SOF Critical Equipment Decontamination (CEDS) programs will develop reliable and modular hardware intended to decontaminate military equipment in operational environments, including personal effects and weapons, to pre-contamination conditions. This capability is needed to sustain the both the Joint and Special Operations Forces by reducing logistical burdens in order to increase tactical agility and sustain a resilient force posture, and align with the National Defense Strategy (NDS). SEDS and CEDS will provide contamination mitigation capabilities for critical equipment that have been exposed to chemical and biological contamination and achieve efficacy levels that allow unprotected post-decontamination exposures for long periods with less than negligible severity effects. In FY24, the Joint SEDS effort will continue through the EMD phase with Developmental Testing (DT) and a Critical Design Review (CDR).

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2022	FY 2023	FY 2024
Title: 1) AUTOINJ - RAD-A	-	14.070	35.694

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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2022	FY 2023	FY 2024
<p>Description: Reconstituting Autoinjector Development (RAD-A)</p> <p>FY 2023 Plans: Initiate development of a Wet/Dry atropine autoinjector.</p> <p>FY 2024 Plans: Initiate formulation and device development with two performers which includes the evaluation of three different formulation methods for atropine. Initiate human factors evaluation of the atropine autoinjector. Initiate technology transfer and batch production of atropine. Initiate equipment purchases and certification/qualification to good manufacturing practice (GMP) standards.</p> <p>FY 2023 to FY 2024 Increase/Decrease Statement: Increase due to change in program/project technical parameters. Funding from previously planned Alt Midazolam effort transferred to Wet/Dry atropine autoinjector to fund additional performer.</p>			
<p>Title: 2) AUTOINJ - Dual Drug Delivery Device (D4)</p> <p>Description: Food and Drug Administration (FDA) Coordination</p> <p>FY 2023 Plans: Submit FDA application for D4 and ALT- Diazepam.</p> <p>FY 2024 Plans: Continue FDA submission of FDA application for Dual Drug Delivery Device (D4) & ALT-Diazepam.</p> <p>FY 2023 to FY 2024 Increase/Decrease Statement: Increase due to change in program/project schedule. Schedule moved to right due to additional development activities in FY22.</p>	-	0.656	0.776
<p>Title: 3) AV TX</p> <p>Description: Enabling Technologies</p> <p>FY 2023 Plans: Complete efficacy studies and prepare Food and Drug Administration (FDA) approval package.</p> <p>FY 2023 to FY 2024 Increase/Decrease Statement: Program/project is entering completion and all activities will be closed.</p>	-	10.506	-
<p>Title: 4) CET RAIDR</p>	-	7.871	13.703

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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2022	FY 2023	FY 2024
<p>Description: Advanced Development</p> <p>FY 2023 Plans: Continue advanced development of up to two (2) FDA-approved and/or late-stage products for repurposing against CBRN indications</p> <p>FY 2024 Plans: Continue nonclinical studies to evaluate up to two (2) FDA-approved and/or late-stage products to repurpose as a CBRN Medical Countermeasure. Studies will generate safety and efficacy data to support the use of the tested product against CBRN symptoms.</p> <p>FY 2023 to FY 2024 Increase/Decrease Statement: Additional investment in enhanced biodefense and pandemic preparedness. Increased investment provided to support further non-clinical studies to generate additional safety and efficacy data to support drug repurposing.</p>			
<p>Title: 5) CET RAIDR-ENBD</p> <p>Description: Advanced Development</p> <p>FY 2023 Plans: Initiate nonclinical studies to evaluate FDA-approved and/or late-stage products to repurpose as a CBRN Medical Countermeasure. Studies will generate safety and efficacy data to support the use of the tested product against a new CBRN threat.</p> <p>FY 2024 Plans: Continue Non-human primate (NHP) studies to evaluate FDA-approved therapeutics to repurpose as a CBRN Medical Countermeasure. These studies will generate data to support potential expansion of use against CBRN symptoms.</p>	-	8.500	8.500
<p>Title: 6) DFoS CIDAS BLISTER</p> <p>Description: Blister Indicator Kits and Large Scale Applicators (LSA)</p> <p>FY 2023 Plans: Award contract option with prime contractor to acquire 200 SSA Blister Kits and 45 LSA Blister Kits to complete developmental testing. Conduct System Verification Review (SVR), Production Readiness Review (PRR), Manufacturing Readiness Assessment (MRA) and Logistics Demonstration. Award Low-Rate Initial Production (LRIP) option for production representative kits for 25 SSA-B kits and 30 LSKB kits in support of Operational Test planned for 4QFY23.</p> <p>FY 2024 Plans:</p>	-	3.681	2.500

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B. Accomplishments/Planned Programs (\$ in Millions)		FY 2022	FY 2023	FY 2024
<p>Conduct a Manufacturing Readiness Assessment (MRA) and a Physical Configuration Audit (PCA) with Prime Contractor and complete Operational Testing (OT) in support of Full Rate Production (FRP)/Fielding Decision.</p> <p>FY 2023 to FY 2024 Increase/Decrease Statement: Program/project transitioned to Production and Deployment Phase. FY24 is last year of BA5 funding, program is transitioning to Production.</p>				
<p>Title: 7) FAMS-S</p> <p>Description: Small and large variant prototype refinement and close out of remaining DT/OT activities.</p> <p>FY 2023 Plans: Complete engineering and manufacturability development for the man-portable FAMS-S variant; complete developmental and operational testing for the vehicle-mounted prototypes to include chemical and biological decontamination level assessment, systems engineering and integration with vehicle platforms, and operational suitability and safety testing.</p> <p>FY 2023 to FY 2024 Increase/Decrease Statement: Program/project transitioned to Production and Deployment Phase.</p>		-	2.967	-
<p>Title: 8) INATS CA - Clinical</p> <p>Description: Clinical Testing to support FDA approval</p> <p>FY 2023 Plans: Complete drug/drug interaction clinical safety study.</p> <p>FY 2024 Plans: Initiate Bioavailability/Bioequivalent (BA/BE) clinical trial with autoinjector.</p> <p>FY 2023 to FY 2024 Increase/Decrease Statement: Minor change due to routine program adjustments.</p>		-	5.101	4.572
<p>Title: 9) INATS CA - Manufacturing</p> <p>Description: Manufacture drug product and device development</p> <p>FY 2023 Plans: Continue Auto-Injector Development and manufacturing activities of the drug product and autoinjector device.</p>		-	14.815	6.019

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B. Accomplishments/Planned Programs (\$ in Millions)		FY 2022	FY 2023	FY 2024
Initiate manufacture of GMP registration lots. Initiate stability studies. FY 2024 Plans: Continuing manufacturing of registration lots, and stability studies. FY 2023 to FY 2024 Increase/Decrease Statement: Minor change due to routine program adjustments. Decrease due to ramping down manufacturing activities.				
Title: 10) INATS CA - Non-Clinical Description: Non-Clinical FY 2023 Plans: Continuing Non-Clinical Animal Studies. Continuing Pivotal Animal Efficacy Studies. FY 2024 Plans: Continuing Non-Clinical Studies. Continue Pivotal Animal and Efficacy Studies. FY 2023 to FY 2024 Increase/Decrease Statement: Increase due to change in program/project schedule. Increase due to bulk of studies occurring in FY24.		-	3.063	5.652
Title: 11) SEDS Description: Engineering, Manufacturing and Development (EMD) activities and Product Development FY 2023 Plans: Conduct MS B activities for Special Operation Forces (SOF) and Other Services. Award contract to conduct EMD testing. Conduct Preliminary Design Review (PDR) for SOF. Prepare for Operational Assessment for SOF and EDT for Other Services. FY 2024 Plans: Continue through the Joint SEDS Engineering, Manufacturing and Development (EMD) phase with Developmental Testing (DT) and post MS B activities. Conduct a CDR and complete EMD phase for SOF. FY 2023 to FY 2024 Increase/Decrease Statement: Program/project funding transferred from another funding line.		-	2.995	11.025
Accomplishments/Planned Programs Subtotals		-	74.225	88.441

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C. Other Program Funding Summary (\$ in Millions)

Line Item	FY 2022	FY 2023	FY 2024	FY 2024	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028	Cost To	
			Base	OCO	Total					Complete	Total Cost
• DE5: Decontamination (SDD)	7.485	-	-	-	-	-	-	-	-	0.000	7.485
• MB5: Medical Biological Defense (SDD)	138.156	-	-	-	-	-	-	-	-	0.000	138.156
• MC5: Medical Chemical Defense (SDD)	38.936	-	-	-	-	-	-	-	-	0.000	38.936
• MC7: Medical Chemical Defense (Op Sys Dev)	1.013	-	-	-	-	-	-	-	-	0.000	1.013
• MT4: Mitigate (ACD&P)	-	17.302	28.785	-	28.785	20.885	15.433	13.369	-	Continuing	Continuing
• MT7: Mitigate (Op Sys Dev)	-	5.098	3.074	-	3.074	1.987	1.819	1.845	1.862	Continuing	Continuing
• JD0050: Decontamination Family Of Systems (DFoS)	7.797	4.795	6.062	-	6.062	8.673	8.820	16.518	5.996	Continuing	Continuing
• PHM007: Service Equipment Decontamination System (SEDS)	-	-	-	-	-	14.028	22.531	24.920	13.050	Continuing	Continuing
• PHM025: Forward Air Mobility Spray System (FAMS-S)	-	4.607	4.824	-	4.824	4.724	4.724	4.724	4.889	Continuing	Continuing
• PHM040: Improved Nerve Agent Treatment Centrally Acting (INATS CA)	-	-	-	-	-	-	-	6.511	33.883	Continuing	Continuing

Remarks

D. Acquisition Strategy

ALTERNATE AUTOINJECTOR MANUFACTURER CAPABILITY (AUTOINJ)

The AUTOINJ will identify an alternative source(s) to develop and provide required Food and Drug Administration (FDA)-approved autoinjector-delivered nerve agent antidote and treatment capabilities to the DoD. The AUTOINJ effort leverages novel technologies and industrial base expansion in order to develop the autoinjector products. AUTOINJ uses contracts and Other Transactional Agreements (OTAs) in which the performer shall be responsible for conducting development and testing activities consistent with current FDA regulations. The contractor shall sponsor the combination product to the FDA and hold all approvals and/or licenses. Upon FDA approval, purchases for product sustainment will be made by the Defense Logistics Agency.

ANTI-VIRAL THERAPEUTICS (AV TX)

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The Antiviral Therapeutics (AV TX) program acquisition strategy supports the development of therapeutics against Marburg virus bio-warfare threats. The overall regulatory approach of the program remains to pursue development for FDA approval und the Animal Rule. The acquisition strategy is for the Marburg indication and will leverage collected safety data and large-scale manufacturing from the COVID efforts. This product was transitioned from Science and Technology (S&T).

COUNTERING EMERGING THREATS RAPID ACQUISITION AND INVESTIGATION OF DRUGS FOR REPURPOSING (CET RAIDR)

CET RAIDR: Countering Emerging Threats - Rapid Acquisition and Investigation of Drugs for Repurposing (CET RAIDR) is an investment program that leverages lessons learned and established manufacturing and safety databases to conduct studies to evaluate U.S. Food & Drug Administration (FDA) approved and late-stage development therapeutics against CBRN threats. Data generated from these efforts will be used to provide a solution to protect the Warfighter against CBRN threats that do not have any identified medical countermeasures. CET RAIDR utilizes multiple contracting and management strategies through existing service laboratory Interagency Agreements (IAAs), Cooperative Research and Development Agreements (CRADAs), flexible contracts, Broad Agency Announcements, and Other Transaction Authority (OTA) agreements.

COUNTERING EMERGING THREATS RAPID ACQUISITION AND INVESTIGATION OF DRUGS FOR REPURPOSING-ENHANCED BIODEFENSE (CET RAIDR-ENBD)

The Countering Emerging Threats - Rapid Acquisition and Investigation of Drugs for Repurposing Enhanced Biodefense (CET RAIDR ENBD) program will leverage lessons learned to conduct NHP studies to evaluate FDA-approved therapeutics against CBRN threats. Data generated from these efforts will be utilized to support potential expansion of use against CBRN symptoms. CET RAIDR ENBD utilizes multiple contracting and management strategies through existing service laboratory IAAs, Cooperative Research and Development Agreements (CRADAs), flexible contracts, Broad Agency Announcements, and Other Transaction Authority (OTA) agreements.

DFoS CONTAMINATION INDICATOR DECON ASSURANCE SPRAY BLISTER (DFoS CIDAS BLISTER)

The DFoS CIDAS Blister program will follow an evolutionary acquisition strategy. The program office coordinated with Science and Technology efforts to identify blister technologies that met Service requirements. After further development, a sole-source performance based indefinite delivery indefinite quantity contract was awarded to develop blister indicator and small scale applicator systems with options for production. The program will leverage the contract to procure blister indicator kits and conduct test and evaluation events for the Engineering and Manufacturing Development (EMD) phase in preparation of Milestone C/Full Rate Production (FRP).

FORWARD AREA MOBILITY SPRAY SYSTEM (FAMS-S)

The FAMS-S will be developed using Middle Tier Acquisition (MTA) to advance decontamination technology and capability for Special Operations Forces (SOF) and Special Operations Task Forces (SOTF) application to tactical and strategic platforms in accordance with MTA authorities and regulations and the Capability Development Document (CDD). FAMS-S will reduce technological risk by reviewing existing materials and technologies as well as designs, configurations, and test data from mature legacy and commercial decontamination systems. The program will utilize the CWMD Other Transaction Authority (OTA) agreement to competitively

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award projects to three vendors for the man-portable and three vendors for the vehicle-mounted variants followed by a prototype down-select. The program will perform technical evaluations, undergo developmental and operational testing, and early user assessments to inform the final prototype design across each variant in preparation for the man-portable variant production decision in FY23.

IMPROVED NERVE AGENT TREATMENT CENTRALLY ACTING (INATS CA)

The Improved Nerve Agent Treatment System Centrally Acting (INATS CA) consists of scopolamine in an autoinjector as adjunct therapy to current nerve agent medical countermeasure (MCM) treatments. Addition of scopolamine to existing treatments for nerve agent exposure increases survival of casualties compared to treatment without scopolamine. The contractors shall be the sponsor and conduct drug development activities to achieve Food and Drug Administration (FDA) approval of both a vial product, and the drug-device combination product. Upon U.S. Food & Drug Administration (FDA) approval, a follow-on procurement contract will allow the contractor to manufacture and deliver sufficient quantities of the autoinjector to meet Full Operational Capability (FOC). Product sustainment will be the responsibility of Defense Logistics Agency Troop Support. Post marketing commitments and requirements are anticipated as a result of FDA approval and will be the responsibility of the contractor and the government.

SERVICE EQUIPMENT DECONTAMINATION SYSTEM (SEDS)

The Joint Services Equipment Decontamination System (SEDS) and SOCOM Critical Equipment Decontamination System (CEDS) program will utilize the Countering Weapons of Mass Destruction Other Transaction Authority (CWMD OTA) to design and develop state of the art equipment using competitive and iterative prototyping. The program will test prototypes against live chemical warfare agents and biological warfare agents, conduct reliability, availability, and maintainability testing, conduct regular user evaluations to identify human system integration issues, and will conduct testing to ensure the system meets military standards. The program will use the Request for Prototype Proposals (RPP), under the CWMD OTA, followed by awards of Prototype Agreement. In FY24, the Program will conduct MS B activities for Joint Services/SEDS and Special Operation Forces (SOF) CEDS will conclude Engineering, Manufacturing and Development (EMD) testing, conduct operational testing and limited user evaluations, and conduct a Critical Design Review (CDR) for SOF.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Chemical and Biological Defense Program **Date:** March 2023

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Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
AUTOINJ - HW C - RAD-A	C/CPFF	TBD : N/A	-	0.000		10.558	Mar 2023	30.372	Dec 2023	-		30.372	Continuing	Continuing	0.000
AUTOINJ - HW C - Program Management Labor	Various	JPM CBRN Medical, JPEO-CBRND : Fort Detrick, MD	-	0.000		1.119	Dec 2022	1.670	Nov 2023	-		1.670	Continuing	Continuing	0.000
AUTOINJ - HW C - Program Management	C/CPFF	JPM CBRN Medical, JPEO-CBRND : Fort Detrick, MD	-	0.000		1.347	Dec 2022	2.011	Nov 2023	-		2.011	Continuing	Continuing	0.000
AV TX - Nonclinical Trials - OTA	C/FP	Gilead Sciences : San Francisco, CA	-	0.000		10.506	Dec 2022	0.000		-		0.000	0.000	10.506	0.000
CET RAIDR - Direct Product Support	Various	Various : N/A	-	0.000		0.000		1.254	Dec 2023	-		1.254	Continuing	Continuing	0.000
CET RAIDR-ENBD - Nonclinical Studies	Various	Various : N/A	-	0.000		7.268	Dec 2022	6.787	Dec 2023	-		6.787	Continuing	Continuing	0.000
CET RAIDR-ENBD - Direct Program Support	Various	Various : N/A	-	0.000		0.000		0.778	Dec 2023	-		0.778	Continuing	Continuing	0.000
DFoS CIDAS BLISTER - HW S - Small and Large Scale Applicators/Kits	SS/ Various	FLIR Systems, Inc. : Stillwater, OK	-	0.000		1.280	Jan 2023	0.000		-		0.000	0.000	1.280	0.000
FAMS-S - HW S - System Development and Prototype Refinement	C/CPIF	ATI Solutions, Inc. : Tysons Corner, VA	-	0.000		1.500	May 2023	0.000		-		0.000	0.000	1.500	0.000
INATS CA - HW C - Program Management Labor	Allot	JPM CBRN Medical, JPEO-CBRND : Fort Detrick, MD	-	0.000		0.000		1.234	Nov 2023	-		1.234	Continuing	Continuing	0.000
INATS CA - HW C - Clinical	C/CPFF	Battelle Memorial Institute : Columbus, OH	-	0.000		2.143	Dec 2022	3.531	Dec 2023	-		3.531	Continuing	Continuing	0.000
INATS CA - HW C - Non-Clinical	C/CPFF	Battelle Memorial Institute : Columbus, OH	-	0.000		3.904	Nov 2022	4.290	Dec 2023	-		4.290	Continuing	Continuing	0.000
INATS CA - HW C - Manufacturing	C/FFP	Aktivax : Boulder, CO	-	0.000		11.008	Dec 2022	3.915	Dec 2023	-		3.915	Continuing	Continuing	0.000

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Chemical and Biological Defense Program **Date:** March 2023

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Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
SEDS - HW S - SEDS - Prototypes	C/FFP	ATI Solutions, Inc. : Tysons Corner, VA	-	0.000		1.450	May 2023	3.453	Nov 2023	-		3.453	Continuing	Continuing	0.000
SEDS - HW S - CEDS	MIPR	Various : N/A	-	0.000		0.000		1.712	Jan 2024	-		1.712	Continuing	Continuing	0.000
Subtotal			-	0.000		52.083		61.007		-		61.007	Continuing	Continuing	N/A

Support (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
DFoS CIDAS BLISTER - TD/D S - IPT and Technical Support	MIPR	Various : N/A	-	0.000		0.656	Nov 2022	0.375	Nov 2023	-		0.375	Continuing	Continuing	0.000
FAMS-S - ES S - Systems Engineer/Technical SME Support	MIPR	Various : N/A	-	0.000		0.750	Dec 2022	0.000		-		0.000	0.000	0.750	0.000
SEDS - ILS S - SEDS - Logistics, Engineering and IPT Support	MIPR	Various : N/A	-	0.000		0.900	Mar 2023	0.836	Nov 2023	-		0.836	Continuing	Continuing	0.000
SEDS - ILS S - CEDS	MIPR	Various : N/A	-	0.000		0.000		0.210	Nov 2023	-		0.210	Continuing	Continuing	0.000
Subtotal			-	0.000		2.306		1.421		-		1.421	Continuing	Continuing	N/A

Test and Evaluation (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
CET RAIDR - DTE C - Continuing Repurposing Efforts	Various	Various : N/A	-	0.000		6.964	Dec 2022	10.942	Dec 2023	-		10.942	Continuing	Continuing	0.000
DFoS CIDAS BLISTER - OTHT S - OTHT S - DT/OT	MIPR	Various : N/A	-	0.000		1.462	Nov 2022	1.972	Nov 2023	-		1.972	Continuing	Continuing	0.000

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Chemical and Biological Defense Program **Date:** March 2023

Appropriation/Budget Activity 0400 / 5	R-1 Program Element (Number/Name) PE 0604384BP / Chemical and Biological Defense Program - EMD	Project (Number/Name) MT5 / Mitigate (SDD)
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Test and Evaluation (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
FAMS-S - DTE SB - Decon Solution Analysis	Various	TBD : N/A	-	0.000		0.288	Jan 2023	0.000		-		0.000	0.000	0.288	0.000
SEDS - OTHT S - SEDS - T&E IPR Test Planning	MIPR	Various : N/A	-	0.000		0.425	Mar 2023	0.944	Nov 2023	-		0.944	Continuing	Continuing	0.000
SEDS - OTHT S - CEDS T&E	MIPR	Various : N/A	-	0.000		0.000		3.177	Jan 2024	-		3.177	Continuing	Continuing	0.000
Subtotal			-	0.000		9.139		17.035		-		17.035	Continuing	Continuing	N/A

Management Services (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
AUTOINJ - PM/MS C - Management Services	Various	Various : N/A	-	0.000		1.702	Dec 2022	2.417	Nov 2023	-		2.417	Continuing	Continuing	0.000
CET RAIDR - PM/MS S - Indirect Management Support	Various	Various : N/A	-	0.000		0.907	Dec 2022	1.507	Dec 2023	-		1.507	Continuing	Continuing	0.000
CET RAIDR-ENBD - PM/MS S - Indirect Management Support	Various	Various : N/A	-	0.000		1.232	Dec 2022	0.935	Dec 2023	-		0.935	Continuing	Continuing	0.000
DFoS CIDAS BLISTER - PM/MS S - Program Management Support	MIPR	Various : N/A	-	0.000		0.283	Nov 2022	0.153	Nov 2023	-		0.153	Continuing	Continuing	0.000
FAMS-S - PM/MS S - Indirect Program Management	MIPR	Various : N/A	-	0.000		0.429	Dec 2022	0.000		-		0.000	0.000	0.429	0.000
INATS CA - PM/MS C - Management Services Labor	Various	JPEO Chem, Bio, Rad, and Nuc Defense (JPEO-CBRND) : Aberdeen Proving Ground, MD	-	0.000		4.595	Dec 2022	1.787	Nov 2023	-		1.787	Continuing	Continuing	0.000
INATS CA - PM/MS C - Management Services	Various	JPEO Chem, Bio, Rad, and Nuc	-	0.000		1.329	Dec 2022	1.486	Nov 2023	-		1.486	Continuing	Continuing	0.000

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Exhibit R-4, RDT&E Schedule Profile: PB 2024 Chemical and Biological Defense Program **Date:** March 2023

Appropriation/Budget Activity 0400 / 5	R-1 Program Element (Number/Name) PE 0604384BP / <i>Chemical and Biological Defense Program - EMD</i>	Project (Number/Name) MT5 / <i>Mitigate (SDD)</i>
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	FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027				FY 2028			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
AUTOINJ - Development	██████████				██████████				██████████				██████████				██████████				██████████				██████████			
AUTOINJ - Manufacturing	██████████				██████████				██████████				██████████				██████████				██████████				██████████			
AUTOINJ - Prototyping and Testing	██████████				██████████				██████████				██████████				██████████				██████████				██████████			
AUTOINJ - Dual Drug Delivery Device (D4)	██████████				██████████				██████████				██████████				██████████				██████████				██████████			
AUTOINJ - Government Testing	██████████				██████████				██████████				██████████				██████████				██████████				██████████			
AUTOINJ - RAD - A	██████████				██████████				██████████				██████████				██████████				██████████				██████████			
AV TX - sNDA (Marburg)	██████████				██████████				██████████				██████████				██████████				██████████				██████████			
AV TX - Natural History Study (Marburg)	██████████				██████████				██████████				██████████				██████████				██████████				██████████			
AV TX - Animal Efficacy Studies (Marburg)	██████████				██████████				██████████				██████████				██████████				██████████				██████████			
CET RAIDR - Advance Development Efforts to Repurpose FDA Approved Products	██████████				██████████				██████████				██████████				██████████				██████████				██████████			
CET RAIDR-ENBD - Advance Development Efforts to Repurpose FDA Approved Products	██████████				██████████				██████████				██████████				██████████				██████████				██████████			
DFoS CIDAS BLISTER - Sustainment Cost Reduction Plan (SCRP)	██████████				██████████				██████████				██████████				██████████				██████████				██████████			
DFoS CIDAS BLISTER - DT&E-Developmental Test and Evaluation - Phase 1	██████████				██████████				██████████				██████████				██████████				██████████				██████████			
DFoS CIDAS BLISTER - System Verification Review (SVR)/Production Readiness Review	██████████				██████████				██████████				██████████				██████████				██████████				██████████			
DFoS CIDAS BLISTER - Functional Configuration Audit (FCA)	██████████				██████████				██████████				██████████				██████████				██████████				██████████			
DFoS CIDAS BLISTER - DT&E-Developmental Test and Evaluation - Phase 2	██████████				██████████				██████████				██████████				██████████				██████████				██████████			
DFoS CIDAS BLISTER - OT&E-Operational Test and Evaluation - CIDAS Blister	██████████				██████████				██████████				██████████				██████████				██████████				██████████			
DFoS CIDAS BLISTER - Manufacturing Readiness Assessment	██████████				██████████				██████████				██████████				██████████				██████████				██████████			

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Exhibit R-4, RDT&E Schedule Profile: PB 2024 Chemical and Biological Defense Program **Date:** March 2023

Appropriation/Budget Activity 0400 / 5	R-1 Program Element (Number/Name) PE 0604384BP / <i>Chemical and Biological Defense Program - EMD</i>	Project (Number/Name) MT5 / <i>Mitigate (SDD)</i>
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	FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027				FY 2028			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
DFoS CIDAS BLISTER - Physical Configuration Audit																												
DFoS CIDAS BLISTER - MS C-Milestone C																												
DFoS CIDAS BLISTER - FRP-Full Rate Production Decision																												
DFoS CIDAS BLISTER - IOC-Initial Operational Capability																												
DFoS CIDAS BLISTER - FOC-Full Operational Capability - CIDAS Blister																												
FAMS-S - PDR-Preliminary Design Review - Man-Portable Variant																												
FAMS-S - CDR-Critical Design Review - Man-Portable Variant																												
FAMS-S - MTA Outcome Decision Memorandum-Middle Tier Acquisition Outcome Decision Memorandum - Man-Portable Variant																												
FAMS-S - OT&E-Operational Test and Evaluation - Man-Portable Variant																												
FAMS-S - PDR-Preliminary Design Review - Small/Large Variants																												
FAMS-S - OT&E-Operational Test and Evaluation - Small/Large Variants																												
FAMS-S - CDR-Critical Design Review - Small/Large Variants																												
FAMS-S - MTA Outcome Decision Memorandum-Middle Tier Acquisition Outcome Decision Memorandum - Small/Large Variants																												
FAMS-S - IOC-Initial Operational Capability - All Variants																												

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Exhibit R-4, RDT&E Schedule Profile: PB 2024 Chemical and Biological Defense Program **Date:** March 2023

Appropriation/Budget Activity 0400 / 5	R-1 Program Element (Number/Name) PE 0604384BP / <i>Chemical and Biological Defense Program - EMD</i>	Project (Number/Name) MT5 / <i>Mitigate (SDD)</i>
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	FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027				FY 2028			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4

SEDS - RFP-Development Request for Proposal Release Decision - SOF and Other Services	█																											
SEDS - MS B-Milestone B - SOF	█																											
SEDS - MS C-Milestone C - SOF	█																											
SEDS - IOC-Initial Operational Capability - SOF	█																											
SEDS - FOC-Full Operational Capability - SOF	█																											

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Chemical and Biological Defense Program		Date: March 2023
Appropriation/Budget Activity 0400 / 5	R-1 Program Element (Number/Name) PE 0604384BP / <i>Chemical and Biological Defense Program - EMD</i>	Project (Number/Name) MT5 / <i>Mitigate (SDD)</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
AUTOINJ - Development	1	2022	4	2023
AUTOINJ - Manufacturing	1	2022	4	2023
AUTOINJ - Prototyping and Testing	1	2022	2	2023
AUTOINJ - Dual Drug Delivery Device (D4)	1	2022	1	2025
AUTOINJ - Government Testing	1	2022	2	2022
AUTOINJ - RAD - A	2	2023	4	2027
AV TX - sNDA (Marburg)	4	2023	2	2024
AV TX - Natural History Study (Marburg)	1	2022	1	2023
AV TX - Animal Efficacy Studies (Marburg)	1	2022	4	2023
CET RAIDR - Advance Development Efforts to Repurpose FDA Approved Products	1	2023	4	2028
CET RAIDR-ENBD - Advance Development Efforts to Repurpose FDA Approved Products	1	2024	4	2028
DFoS CIDAS BLISTER - Sustainment Cost Reduction Plan (SCRP)	1	2022	3	2022
DFoS CIDAS BLISTER - DT&E-Developmental Test and Evaluation - Phase 1	2	2022	4	2022
DFoS CIDAS BLISTER - System Verification Review (SVR)/Production Readiness Review	3	2023	3	2023
DFoS CIDAS BLISTER - Functional Configuration Audit (FCA)	4	2023	4	2023
DFoS CIDAS BLISTER - DT&E-Developmental Test and Evaluation - Phase 2	1	2024	1	2025
DFoS CIDAS BLISTER - OT&E-Operational Test and Evaluation - CIDAS Blister	1	2024	1	2024
DFoS CIDAS BLISTER - Manufacturing Readiness Assessment	1	2024	1	2024
DFoS CIDAS BLISTER - Physical Configuration Audit	2	2024	2	2024
DFoS CIDAS BLISTER - MS C-Milestone C	4	2024	4	2024
DFoS CIDAS BLISTER - FRP-Full Rate Production Decision	4	2024	4	2024

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Chemical and Biological Defense Program **Date:** March 2023

Appropriation/Budget Activity 0400 / 5	R-1 Program Element (Number/Name) PE 0604384BP / <i>Chemical and Biological Defense Program - EMD</i>	Project (Number/Name) MT5 / <i>Mitigate (SDD)</i>
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Events	Start		End	
	Quarter	Year	Quarter	Year
DFoS CIDAS BLISTER - IOC-Initial Operational Capability	2	2027	2	2027
DFoS CIDAS BLISTER - FOC-Full Operational Capability - CIDAS Blister	2	2028	2	2028
FAMS-S - PDR-Preliminary Design Review - Man-Portable Variant	3	2022	3	2022
FAMS-S - CDR-Critical Design Review - Man-Portable Variant	2	2023	2	2023
FAMS-S - MTA Outcome Decision Memorandum-Middle Tier Acquisition Outcome Decision Memorandum - Man-Portable Variant	3	2023	3	2023
FAMS-S - OT&E-Operational Test and Evaluation - Man-Portable Variant	2	2023	2	2023
FAMS-S - PDR-Preliminary Design Review - Small/Large Variants	4	2022	4	2022
FAMS-S - OT&E-Operational Test and Evaluation - Small/Large Variants	2	2024	2	2024
FAMS-S - CDR-Critical Design Review - Small/Large Variants	3	2024	3	2024
FAMS-S - MTA Outcome Decision Memorandum-Middle Tier Acquisition Outcome Decision Memorandum - Small/Large Variants	3	2024	3	2024
FAMS-S - IOC-Initial Operational Capability - All Variants	3	2024	2	2026
FAMS-S - FOC-Full Operational Capability - All Variants	4	2028	4	2028
INATS CA - MS B-Milestone B	2	2022	2	2022
INATS CA - Clinical Trials	1	2022	4	2024
INATS CA - Manufacturing/Auto-Injector	1	2022	2	2025
INATS CA - Non-Clinical Studies	1	2022	2	2025
INATS CA - NDA Submission-New Drug Application Submission	1	2026	3	2026
INATS CA - FDA Approval-Food and Drug Administration Approval	3	2026	1	2028
INATS CA - SNAPP Modernization - BA7	1	2022	4	2025
INATS CA - PB Extended Release Tablet Development - BA7	1	2023	1	2026
SEDS - Prototype Agreement Award (SOF and Other Services)	4	2022	4	2022
SEDS - CDD Validation-Capability Development Document Validation - Other Services	1	2023	2	2023
SEDS - Early Developmental Testing (Other Services)	1	2023	3	2023
SEDS - MS B-Milestone B - Other Services	4	2023	4	2023

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Chemical and Biological Defense Program **Date:** March 2023

Appropriation/Budget Activity 0400 / 5	R-1 Program Element (Number/Name) PE 0604384BP / <i>Chemical and Biological Defense Program - EMD</i>	Project (Number/Name) MT5 / <i>Mitigate (SDD)</i>
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Events	Start		End	
	Quarter	Year	Quarter	Year
SEDS - DT&E-Developmental Test and Evaluation - Other Services	1	2024	3	2025
SEDS - MS C-Milestone C - Other Services	3	2026	3	2026
SEDS - FRP-Full Rate Production Decision - Other Services	4	2027	4	2027
SEDS - DT&E-Developmental Test and Evaluation - SOF	3	2022	4	2023
SEDS - RFP-Development Request for Proposal Release Decision - SOF and Other Services	4	2022	4	2022
SEDS - MS B-Milestone B - SOF	3	2023	3	2023
SEDS - MS C-Milestone C - SOF	4	2024	4	2024
SEDS - IOC-Initial Operational Capability - SOF	2	2026	2	2026
SEDS - FOC-Full Operational Capability - SOF	4	2028	4	2028

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Chemical and Biological Defense Program										Date: March 2023		
Appropriation/Budget Activity 0400 / 5					R-1 Program Element (Number/Name) PE 0604384BP / <i>Chemical and Biological Defense Program - EMD</i>				Project (Number/Name) EN5 / <i>Enabling Investments (SDD)</i>			
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
EN5: <i>Enabling Investments (SDD)</i>	-	0.000	13.392	13.835	0.000	13.835	13.884	14.179	14.197	14.261	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Enabling Investments System Development & Demonstration (SDD) Project provides the capability to rapidly develop, manufacture, and approve medical countermeasures through sustaining the Department of Defense advanced development manufacturing facility. Enabling efforts in this area support dedicated infrastructure capabilities, demonstrations, and overarching development support functions as portfolio enablers responding to emerging threats. Additional efforts facilitate incorporation of chemical and biological (CB) survivability equipment into Service major acquisition programs. In FY 2023, the Chemical Biological Defense Program (CBDP) RDT&E Projects were restructured to align with the CBDP portfolio construct. EN5 efforts in FY 2022 remain in Projects DE5 and MB5. This restructuring provided standardization and alignment across CBDP research, development and acquisition efforts.

Efforts included in this Project are:

- (1) Chem Bio Incident Preparedness and Response - Advanced Development and Manufacturing (CBIPR-ADM)
- (2) Major Defense Acquisition Program (MDAP)

The CBIPR-ADM ensures prioritization to domestic biopharmaceutical manufacturing capacities, capabilities, and infrastructure (e.g. the DoD-ADM Facility and other strategic partners) that are operationally ready to rapidly develop and manufacture medical countermeasures (MCMs) against current and emerging chemical and biological threats including pandemic response. Prioritization is achieved by establishing and enhancing proven biopharmaceutical manufacturing platform technologies and infrastructure at these facilities. Thus, these facilities will have the capability to accelerate development of MCMs at all stages of development, enhance preparedness for existing threats, and rapidly respond to emerging threats as part of a medical integrated layered defense. MCMs that benefit from these efforts include: Vaccines for Viral Agents, Vaccines for Bacterial Agents and Toxins, monoclonal antibodies, antibody fragments and conjugates for therapeutic and prophylactic use across all agent classes. Funds to support prioritization and operational readiness were previously provided via individual product development and manufacturing funding lines. The Department is now providing dedicated funds. The CBIPR-ADM return on investment is an increased level of preparedness and responsiveness. In FY24, the CBIPR-ADM program continues to establish and enhance new manufacturing platform technologies and infrastructure that will enable the development of MCMs against chemical and biological threats.

The MDAP Chemical Biological Radiological and Nuclear (CBRN) Survivability Initiative ensures weapon system programs at all Acquisition Category (ACAT) levels, as well as non-DoD agency programs such as those at the Department of Homeland Security (DHS), meet their CBRN defense requirements. This effort facilitates and coordinates the research, development, test and evaluation, procurement, delivery, and life cycle sustainment of affordable CBRN defense materiel solutions for each program's documented CBRN requirements.

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Chemical and Biological Defense Program		Date: March 2023
Appropriation/Budget Activity 0400 / 5	R-1 Program Element (Number/Name) PE 0604384BP / <i>Chemical and Biological Defense Program - EMD</i>	Project (Number/Name) EN5 / <i>Enabling Investments (SDD)</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2022	FY 2023	FY 2024
<p>Title: 1) CBIPR-ADM</p> <p>Description: ADM Infrastructure</p> <p>FY 2023 Plans: Continue activities to maintain the Department of Defense (DoD) ADM's capabilities in a state of readiness to support Medical Countermeasure (MCM) development and manufacturing.</p> <p>FY 2024 Plans: Continue activities to enhance and optimize known manufacturing platform technologies that will maintain the DoD ADM and other strategic partner facilities in a state of operational readiness to support the development and manufacture of medical countermeasure (MCMs). This approach ensures that the DoD's efforts are not limited to a single facility.</p> <p>FY 2023 to FY 2024 Increase/Decrease Statement: Minor change due to routine program adjustments.</p>	-	10.974	11.465
<p>Title: 2) MDAP</p> <p>Description: CBRN Survivability Support</p> <p>FY 2023 Plans: Continue to ensure CBRN survivability requirements are met for MDAP's by cross-walking requirements documents with program execution plans. Attend meetings to address integration needs and present CBRN system and hardware options. Provide subject matter expertise in the execution of CBRN survivability requirements for both materiel and non-material solutions. Review and assist in document preparation for milestones and programs reviews. Conduct CBRN survivability compliance reviews for Optionally Manned Fighting Vehicle, Robotic Combat Vehicle, Future Long Range Assault Aircraft, Future Attack Reconnaissance Aircraft, Synthetic Training Environment, Precision Navigation and Timing, multiple Soldier Lethality programs, and other CBRN survivability system integration in preparation for various program acquisition milestones, design reviews and low rate initial production reviews.</p> <p>FY 2024 Plans: Provide subject matter expertise in the execution of CBRN survivability requirements for both materiel and non-material solutions. Review and assist in document preparation for milestones and programs reviews. Conduct CBRN survivability compliance reviews for Optionally Manned Fighting Vehicle, Robotic Combat Vehicle, Future Long Range Assault Aircraft, Future Attack Reconnaissance Aircraft, Synthetic Training Environment, Precision Navigation and Timing, multiple Soldier Lethality programs,</p>	-	2.418	2.370

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Chemical and Biological Defense Program		Date: March 2023
Appropriation/Budget Activity 0400 / 5	R-1 Program Element (Number/Name) PE 0604384BP / <i>Chemical and Biological Defense Program - EMD</i>	Project (Number/Name) EN5 / <i>Enabling Investments (SDD)</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2022	FY 2023	FY 2024
and other CBRN survivability system integration in preparation for various program acquisition milestones, design reviews and low rate initial production reviews.			
FY 2023 to FY 2024 Increase/Decrease Statement: Minor change due to routine program adjustments.			
Accomplishments/Planned Programs Subtotals	-	13.392	13.835

C. Other Program Funding Summary (\$ in Millions)											
Line Item	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
• DE5: <i>Decontamination (SDD)</i>	7.485	-	-	-	-	-	-	-	-	0.000	7.485
• EN4: <i>Enabling Investments (ACD&P)</i>	-	6.781	47.272	-	47.272	51.579	9.792	9.840	9.840	Continuing	Continuing
• MB4: <i>Medical Biological Defense (ACD&P)</i>	46.791	-	-	-	-	-	-	-	-	0.000	46.791
• MB5: <i>Medical Biological Defense (SDD)</i>	138.156	-	-	-	-	-	-	-	-	0.000	138.156

Remarks

D. Acquisition Strategy

CHEM BIO INCIDENT PREPAREDNESS AND RESPONSE - (CBIPR-ADM)

By establishing new capabilities at the DoD-ADM Facility and other strategic partners, the CBIPR-ADM line ensures that the DoD will have priority access to critical technologies and infrastructure that are operationally ready to support the rapid development and manufacture of MCMs. This approach ensures that the DoD's efforts are not limited to a single facility. In FY24, the CBIPR-ADM line will continue to establish, enhance, and optimize new manufacturing platform technologies and infrastructure to support the production of MCMs. These new manufacturing technologies can come from any government sources (including Joint Science & Technology Office for Chemical Biological Defense (JSTO-CBD), the Walter Reed Army Institute of Research (WRAIR), the Biomedical Advanced Research and Development Authority (BARDA), etc. when mature enough for BA4 funding) and/or other external sources and targets of opportunity from industry.

MAJOR DEFENSE ACQUISITION PROGRAM (MDAP)

MDAP effort provides CBRN capability requirements integration support to Major Defense Acquisition Programs, Services, and Program Executive Offices. Cross-walk requirements with program execution plans, introduce new/existing materiel solutions, develop common integrated CBRN solutions, support Modernization and Readiness efforts.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Chemical and Biological Defense Program **Date:** March 2023

Appropriation/Budget Activity 0400 / 5	R-1 Program Element (Number/Name) PE 0604384BP / <i>Chemical and Biological Defense Program - EMD</i>	Project (Number/Name) EN5 / <i>Enabling Investments (SDD)</i>
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Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
CBIPR-ADM - Capability Optimization (Vero Cell Platform, BSAT Surrogate Platform)	C/CPFF	Ology : Alachua, FL	-	0.000		9.944	Dec 2022	10.763	Dec 2023	-		10.763	Continuing	Continuing	0.000
Subtotal			-	0.000		9.944		10.763		-		10.763	Continuing	Continuing	N/A

Support (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
MDAP - TD/D SB - IPT and Technical Support	MIPR	Various : N/A	-	0.000		2.081	Nov 2022	0.921	Jan 2024	-		0.921	Continuing	Continuing	0.000
Subtotal			-	0.000		2.081		0.921		-		0.921	Continuing	Continuing	N/A

Test and Evaluation (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
MDAP - Robotic Sensors Testing	MIPR	Various : N/A	-	0.000		0.000		0.900	Mar 2024	-		0.900	Continuing	Continuing	0.000
Subtotal			-	0.000		0.000		0.900		-		0.900	Continuing	Continuing	N/A

Management Services (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
CBIPR-ADM - PM/MS C - Program Management Support (SETA)	Various	JPL CBRND Enabling Biotechnologies, JPEO-CBRND : Fort Detrick, MD	-	0.000		1.030	Dec 2022	0.702	Dec 2023	-		0.702	Continuing	Continuing	0.000

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Exhibit R-4, RDT&E Schedule Profile: PB 2024 Chemical and Biological Defense Program		Date: March 2023
Appropriation/Budget Activity 0400 / 5	R-1 Program Element (Number/Name) PE 0604384BP / <i>Chemical and Biological Defense Program - EMD</i>	Project (Number/Name) EN5 / <i>Enabling Investments (SDD)</i>

	FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027				FY 2028			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
CBIPR-ADM - MCM Enabling Manufacturing Technologies	[REDACTED]																											
CBIPR-ADM - MCM Development and Manufacturing Support (Infrastructure)	[REDACTED]																											
MDAP - Engage with services to develop relationships for CBRN requirements	[REDACTED]																											

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Chemical and Biological Defense Program		Date: March 2023
Appropriation/Budget Activity 0400 / 5	R-1 Program Element (Number/Name) PE 0604384BP / <i>Chemical and Biological Defense Program - EMD</i>	Project (Number/Name) EN5 / <i>Enabling Investments (SDD)</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
CBIPR-ADM - MCM Enabling Manufacturing Technologies	1	2022	4	2028
CBIPR-ADM - MCM Development and Manufacturing Support (Infrastructure)	1	2022	4	2028
MDAP - Engage with services to develop relationships for CBRN requirements	1	2022	4	2028

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Chemical and Biological Defense Program										Date: March 2023		
Appropriation/Budget Activity 0400 / 5					R-1 Program Element (Number/Name) PE 0604384BP / <i>Chemical and Biological Defense Program - EMD</i>				Project (Number/Name) CA5 / <i>Contamination Avoidance (SDD)</i>			
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
CA5: <i>Contamination Avoidance (SDD)</i>	-	84.967	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	84.967
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This project supports Engineering and Manufacturing Development (EMD) and Low Rate Initial Production (LRIP) of an array of reconnaissance, detection and identification equipment, and warning systems. After FY 2022, the Chemical Biological Defense Program (CBDP) RDT&E Projects were restructured to align with the CBDP portfolio construct. CA5 efforts in FY 2022 progress to Project UN5. This restructuring provides standardization and alignment across CBDP research, development and acquisition efforts.

Efforts included in this Project are:

- (1) Advanced Emerging Threat Defense (AET DEFENSE) ****Progresses to UN5 in FY2023****,
- (2) Aerosol & Vapor Chemical Agent Detector (AVCAD) ****Progresses to UN5 in FY2023****,
- (3) Multi-Phase Chemical Agent Detector (MPCAD) ****Progresses to UN5 in FY2023****,
- (4) Chemical Biological Radiological and Nuclear (CBRN) Sensor Integration on Robotics Platforms (CSIRP) ****Progresses to UN5 in FY2023****,
- (5) Joint Biological Tactical Detection System (JBTDS) ****Progresses to UN5 in FY2023****,
- (6) Nuclear Biological Chemical Reconnaissance Vehicle Sensor Suite Upgrade (NBCRV SSU) ****Progresses to UN5 in FY2023****, and
- (7) Reactive Chemistry Orthogonal Surface and Environmental Threat Ticket Array (ROSETTA)

The AET DEFENSE program continues to address the highest priority CBRN gaps and supports the Chemical Biological Defense Program (CBDP) Strategic Line of Effort to meet current and emerging threats by anticipating chemical and biological (CB) hazards and developing capabilities to counter emerging and future threats. The AET Defense program collaborates with the Joint Services, interagency, and international partners to align RDT&E resources to determine readiness against emerging threats, to include Non-Traditional Agents (NTAs), such as Novichoks and Pharmaceutical-Based Agents (PBA) (e.g. synthetic opioids), emerging biological threats, and other advanced and emerging threats as they are identified across the entire CBDP enterprise portfolio.

AVCAD is a man portable system to detect aerosol and vapor chemical agents. AVCAD fills critical gaps in current Joint Force chemical sensor capabilities, in the areas of liquid, solid and dusty aerosol Chemical Warfare Agent detection, and detection of specific advanced threats/Non-Traditional Agents. The AVCAD will also detect low-level off-gassing, or residual vapors, to prevent/mitigate health effects associated with low concentration exposures, and perform remote alarm warning and reporting. AVCAD will support chemical and biological defense missions, including monitoring, collective protection, base defense, decontamination, unmasking, reconnaissance, and shipboard and aviation platform chemical detection. In FY24, AVCAD will execute and complete production and deployment testing.

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Chemical and Biological Defense Program		Date: March 2023
Appropriation/Budget Activity 0400 / 5	R-1 Program Element (Number/Name) PE 0604384BP / <i>Chemical and Biological Defense Program - EMD</i>	Project (Number/Name) CA5 / <i>Contamination Avoidance (SDD)</i>
<p>The MPCAD is a two-person portable system that will conduct near real-time, near-laboratory grade analysis of solid, liquid, and vapor samples collected by the operator in a presumptively contaminated area. The MPCAD results will support the Commander's tactical and operational decisions regarding maneuver, protection, decontamination, and treatment measures. The Army and Marine Corps will employ MPCAD in Dismounted Reconnaissance and Site Assessment missions to substantiate presumptive detector results. The Air Force will employ the MPCAD to support Post-Event Reconnaissance in support of Reconnaissance and Surveillance missions by monitoring the environment at airbases after a chemical release. The Air Force will continuously monitor contaminated areas for chronic health effects levels through analysis of samples from collectors deployed at the contamination site and brought back to the analyzer for identification and quantification. This information will support commander decisions to determine Mission Oriented Protective Posture (MOPP) levels and eventual termination of cordon restrictions.</p> <p>CSIRP is a prototyping and fielding effort that will focus on repackaging and integrating of modular CBRN sensor and common interface solutions to enhance Unmanned Aircraft Systems (UAS), Unmanned Surface Vessels (USV) and Unmanned Ground Vehicles (UGV) to provide situational awareness across the echelons of command in order to enable freedom of maneuver and action on the battlefield. An integrated CSIRP capability will exploit advances in artificial intelligence, machine learning and autonomy, sensing and communication capabilities that enable timely and accurate detection, warning and reporting of CBRN hazards. CSIRP reduces risk to the maneuver forces and individual Warfighter in mounted and dismounted operations at the tactical and operational levels. Under Project UN5, in FY24 CSIRP will integrate standoff detection and provide upgrades to CBRN autonomy, mapping and obstacle avoidance for denied global positioning system (GPS) operations on UASs.</p> <p>JBTDS is the first tactical lightweight, low-cost biological surveillance system to detect, collect, and identify Biological Warfare Agent (BWA) aerosols. JBTDS components are man-portable, battery operable and easy to employ by any military user. JBTDS provides notification of a hazard and enhances battle-space awareness to protect and preserve the forces and can archive a sample for follow up analysis. When networked, JBTDS augments existing biological detection systems providing a theater-wide array capable of biological detection, identification and warning to support time sensitive force protection decisions. The JBTDS provides surface sampling capability which interfaces with the JBTDS identifier to support sensitive site exploitation missions. In FY24, JBTDS will continue activities required to support the low rate initial production (LRIP) decision.</p> <p>Nuclear Biological Chemical Reconnaissance Vehicle Sensor Suite Upgrade (NBCRV SSU) provides maneuver formations the ability to conduct mounted Chemical Biological Radiological and Nuclear (CBRN) reconnaissance and surveillance. The NBCRV SSU will answer the commander's priority intelligence requirements & facilitate proactive risk-based decisions, to ensure freedom of action and maintain maneuver momentum in Large Scale Combat Operations. NBCRV SSU is an Acquisition Category (ACAT) II modification work order (MWO) effort to modernize the current NBCRV Sensor Suite to increase maintainability, reliability, maneuverability of the force, and standoff distance from the threat, via enhanced CBRN standoff capabilities & integrating onto robotics for manned unmanned teaming.</p> <p>The ROSETTA is a modernization effort to provide a higher confidence chemical hazard detection tickets in the currently fielded M256A2 kit for the Warfighter to make timely decisions for the general forces. These decisions will reduce casualties and improve the combat effectiveness of troops engaged in conflicts involving the use of chemical threats. ROSETTA is based on colorimetric technologies and will be eye-readable and ease the Warfighter from current training and operational burden. In addition, the ROSETTA tickets will provide improved hazard detection performance with reduced false alarm rate, potential for increased number of chemicals detected, reduced detection time especially for compounds of interest (Chemical Warfare Agents (CWA), Pharmaceutical Based Agents (PBAs), Non-Traditional Agents (NTAs), and Toxic Industrial Chemicals (TICs)), and potential for integration onto unmanned platforms especially micro-sized unmanned aerial sensors. ROSETTA funding discontinues after FY23.</p>		

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Chemical and Biological Defense Program		Date: March 2023
Appropriation/Budget Activity 0400 / 5	R-1 Program Element (Number/Name) PE 0604384BP / <i>Chemical and Biological Defense Program - EMD</i>	Project (Number/Name) CA5 / <i>Contamination Avoidance (SDD)</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2022	FY 2023	FY 2024
Title: 1) AET DEFENSE Description: Program Management, Product Development, Support, and Testing of technologies that have been demonstrated to be TRL 6 or higher in order to rapidly field solutions to combat emerging threats.	2.567	-	-
Title: 2) AVCAD Description: Product Development/Testing	12.640	-	-
Title: 3) AVCAD Description: Support Costs/Program Management	3.685	-	-
Title: 4) MPCAD - Product Development Description: Product Development	7.010	-	-
Title: 5) MPCAD - Testing Description: Testing	4.804	-	-
Title: 6) MPCAD - Program Support Description: Program Management Support	1.159	-	-
Title: 7) CSIRP Description: Product Development, Program Management, Test and Evaluation and Support.	15.653	-	-
Title: 8) JBTDS Description: Test & Evaluation	2.146	-	-
Title: 9) JBTDS Description: EMD Contract & Program Management	7.544	-	-
Title: 10) NBCRV SSU Description: CBRN Sensor Development and Integration	27.551	-	-
Title: 11) ROSETTA - M8	0.208	-	-

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Chemical and Biological Defense Program		Date: March 2023
Appropriation/Budget Activity 0400 / 5	R-1 Program Element (Number/Name) PE 0604384BP / Chemical and Biological Defense Program - EMD	Project (Number/Name) CA5 / Contamination Avoidance (SDD)

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2022	FY 2023	FY 2024
Description: Product Development & Technical Assessment of the M256A2 Kit.			
Accomplishments/Planned Programs Subtotals	84.967	-	-

C. Other Program Funding Summary (\$ in Millions)

<u>Line Item</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u> <u>Base</u>	<u>FY 2024</u> <u>OCO</u>	<u>FY 2024</u> <u>Total</u>	<u>FY 2025</u>	<u>FY 2026</u>	<u>FY 2027</u>	<u>FY 2028</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
• CA4: Contamination Avoidance (ACD&P)	37.189	-	-	-	-	-	-	-	-	0.000	37.189
• CA7: Contamination Avoidance (Op Sys Dev)	12.244	-	-	-	-	-	-	-	-	0.000	12.244
• UN5: Understand (SDD)	-	126.071	182.726	-	182.726	137.991	127.671	108.908	68.088	Continuing	Continuing
• UN7: Understand (Op Sys Dev)	-	40.414	50.603	-	50.603	58.881	71.869	68.839	50.628	Continuing	Continuing
• MC0100: Joint NBC Reconnaissance System (JNBCRS)	-	-	-	-	-	-	-	-	-	0.000	0.000
• MX0001: Joint Bio Tactical Detection System (JBTDs)	17.060	-	7.025	-	7.025	22.238	17.385	44.150	44.150	Continuing	Continuing
• SA0005: CBRN Sensor Integration On Robotic Platforms (CSIRP)	3.461	2.099	-	-	-	-	-	-	-	0.000	6.063
• SA0015: Aerosol Vapor Chemical Agent Detector (AVCAD)	-	-	2.458	-	2.458	43.262	55.762	66.237	43.029	Continuing	Continuing
• SA0017: Multiphase Chemical Agent Detector (MPCAD)	6.502	4.014	13.561	-	13.561	21.852	36.758	37.261	0.829	Continuing	Continuing

Remarks

D. Acquisition Strategy

ADVANCED AND EMERGING THREAT DEFENSE (AET DEFENSE)

The AET DEFENSE program will use a variety of acquisition approaches to survey, develop, assess, and rapidly field technologies to inform and fill advanced and emerging threat gaps. The program will utilize an existing Multiple Award Indefinite Delivery Indefinite Quantify Task Order Contract to provide technical support to studies and assessments of performance against emerging threats. For Program of Record (PoR) systems currently in development that will be assessed for performance against emerging threats, those PoR's existing contracts will be modified to incorporate development engineering and test support for emerging threat

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Chemical and Biological Defense Program	Date: March 2023
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Appropriation/Budget Activity 0400 / 5	R-1 Program Element (Number/Name) PE 0604384BP / <i>Chemical and Biological Defense Program - EMD</i>	Project (Number/Name) CA5 / <i>Contamination Avoidance (SDD)</i>
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capability. The AET DEFENSE program will utilize Other Transaction Authority (OTA) agreements for system development and prototyping activities and Government Agencies and Federally Funded Research and Development Centers to provide development, testing and technical support.

AEROSOL VAPOR CHEMICAL AGENT DETECTOR (AVCAD)

Aerosol & Vapor Chemical Agent Detector (AVCAD) awarded two MS B Engineering and Manufacturing Development (EMD) contracts with production options. The AVCAD program is conducting full EMD Record Testing in support of the Milestone C decision. If supported by EMD Test Data and funding, the program will proceed forward with LRIP option award.

MULTI-PHASE CHEMICAL AGENT DETECTOR (MPCAD)

The Multi-Phase Chemical Agent Detector (MPCAD) (formerly NGCD 3) is using a streamlined acquisition strategy. The MPCAD contract(s) are utilizing the Countering Weapons of Mass Destruction (CWMD) Other Transaction Authority (OTA) for EMD and LRIP items. The MPCAD will procure production items through a follow-on Federal Acquisition Regulation based contract. The program will develop and validate the systems during EMD and LRIP utilizing two contractors to increase competition and minimize production price.

CBRN SENSOR INTEGRATION ON ROBOTIC PLATFORMS (CSIRP)

CSIRP is a streamlined and tailored acquisition effort to rapidly prototype and field CBRN payload capabilities for unmanned platforms. CSIRP will provide and integrate unmanned CBRN payload prototypes in cyclic prototyping plan cycles based on service requirements. The prototyping plans will use a streamlined acquisition process in order to keep pace with industry and the rapid advancement of technologies. The CSIRP strategy is to utilize the rapid prototyping process enabled by the Other Transactional Agreements (OTA) contract vehicle. Upon award, the awardees will have two to three years to produce prototype sensors that are integrated onto service selected (air and/or ground) platforms. These prototypes will be demonstrated, evaluated and tested by the Services as well as laboratories and academia. Successful prototypes will be transitioned to the platforms and services for the next steps in acquisition, production and eventual fielding across the services. BA5 funding provides integration, demonstrations, testing, development of interface control documentation, and operational assessments of prototypes to support transition decisions for residual capabilities and final configurations to Program of Record (PoR) or sustained capability.

JOINT BIO TACTICAL DETECTION SYSTEM (JBTDS)

The JBTDS program utilizes a streamlined acquisition strategy leveraging a contract with Chemring Sensors and Electronic Systems (CSES). The contract includes options for Low Rate Initial Production (LRIP) and Full Rate Production (FRP). The JBTDS is moving towards a Milestone C decision in third quarter FY23, utilizing the current contract to award both the LRIP and FRP options. To support the National Guard requirement, the Joint Handheld Biological Identifier (JHBI) will award congruently with the JBTDS LRIP and FRP options. The JBTDS program uses an agile acquisition strategy which leverages current technologies, recognizing up front the need for potential technology insertion to provide more cost effective capabilities.

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Chemical and Biological Defense Program		Date: March 2023
Appropriation/Budget Activity 0400 / 5	R-1 Program Element (Number/Name) PE 0604384BP / <i>Chemical and Biological Defense Program - EMD</i>	Project (Number/Name) CA5 / <i>Contamination Avoidance (SDD)</i>
Nuclear Biological Chemical Reconnaissance Vehicle Sensor Suite Upgrade Nuclear Biological Chemical Reconnaissance Vehicle Sensor Suite Upgrade (NBCRV SSU) is an upgrade for the Stryker NBCRV. The Army Requirements Oversight Council (AROC) Review Board (ARB) decided on 1 FEB 2022 to continue a Modification Work Order (MWO) pathway for Capability Set 2.1 (CS2.1) (initial SSU capability) as a bridge to CS2.2 (full SSU capability). The NBCRV SSU program received prototype CS2.1 systems via Other Transaction Authority (OTA) in March 2022, and will continue testing through October 2023, to inform a Conditional Materiel Release Decision in FY24. An In Progress Review (IPR) will be held starting in FY23 to execute an MWO for CS2.1 production and fielding, starting in FY24. The NBCRV SSU program will receive prototype CS2.2 systems via another OTA in August 2024, followed by testing in FY24 through early FY26 to inform the CS2.2 MWO Full Materiel Release Decision in FY26.		
REACTIVE CHEMISTRY ORTHOGONAL SURFACE AND ENVIRONMENTAL THREAT TICKET ARRAY (ROSETTA) ROSETTA will use a streamlined approach to rapidly field multiple components of the modernization of the M256A2 kit. These efforts will utilize multiple contract vehicles including Countering Weapons of Mass Destruction (CWMD) Other Transactional Authority (OTA). The ROSETTA funding will complete the acquisition of the M8 component to the M256 kit and will support the acquisition of a Pharmaceutical Based Agents ticket, the M256 vapor unmasking tool, and the other Non Traditional Agents and Toxic Industrial Chemicals.		

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Chemical and Biological Defense Program **Date:** March 2023

Appropriation/Budget Activity 0400 / 5	R-1 Program Element (Number/Name) PE 0604384BP / Chemical and Biological Defense Program - EMD	Project (Number/Name) CA5 / Contamination Avoidance (SDD)
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Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
AET DEFENSE - SW C - Prototyping and Modification	Various	U.S. Army Combat Capabilities Development Command (DEVCOM) Chemical Biological Center (CBC) : Aberdeen Proving Ground, MD	-	0.931	Jan 2022	0.000		0.000		-		0.000	0.000	0.931	0.000
AET DEFENSE - HW S - System Prototyping and Modification	Various	Various : N/A	-	0.369	Dec 2021	0.000		0.000		-		0.000	0.197	0.566	0.000
AVCAD - Government Product Development Team Labor	MIPR	Various : N/A	4.520	2.001	May 2022	0.000		0.000		-		0.000	0.000	6.521	0.000
AVCAD - HW S - EMD Contract- Smiths Detection	C/CPIF	Smiths Detection : Edgewood, MD	20.975	8.193	Nov 2021	0.000		0.000		-		0.000	0.000	29.168	0.000
MPCAD - HW S - EMD Contract	C/CPFF	FLIR Systems, Inc. : West Lafayette, IN	22.520	2.475	Dec 2021	0.000		0.000		-		0.000	0.000	24.995	0.000
MPCAD - HW C - Contractor Product Development Team Labor	C/FFP	Kalman & Company Inc. : Virginia Beach, VA	0.408	0.385	Dec 2021	0.000		0.000		-		0.000	0.000	0.793	0.000
MPCAD - PM/MS S - Government Product Development Team Labor	MIPR	U.S. Army Combat Capabilities Development Command (DEVCOM) Chemical Biological Center (CBC) : Aberdeen Proving Ground, MD	5.962	1.932	Nov 2021	0.000		0.000		-		0.000	0.000	7.894	0.000
MPCAD - HW S - EMD Contract	C/CPFF	Signature Science : Austin, TX	32.314	2.218	Dec 2021	0.000		0.000		-		0.000	0.000	34.532	0.000
CSIRP - HW C - Contractor Product Development Labor	C/FFP	Various : N/A	0.318	0.558	Feb 2022	0.000		0.000		-		0.000	0.000	0.876	0.000

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Chemical and Biological Defense Program **Date:** March 2023

Appropriation/Budget Activity 0400 / 5	R-1 Program Element (Number/Name) PE 0604384BP / Chemical and Biological Defense Program - EMD	Project (Number/Name) CA5 / Contamination Avoidance (SDD)
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Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
CSIRP - HW C - Development and Integration	MIPR	U.S. Army Combat Capabilities Development Command (DEVCOM) Chemical Biological Center (CBC) : Aberdeen Proving Ground, MD	0.679	1.493	Dec 2021	0.000		0.000		-		0.000	0.000	2.172	0.000
CSIRP - HW C - Government Product Development Team Labor	MIPR	U.S. Army Combat Capabilities Development Command (DEVCOM) Chemical Biological Center (CBC) : Aberdeen Proving Ground, MD	1.383	1.239	Dec 2021	0.000		0.000		-		0.000	0.000	2.622	0.000
CSIRP - SW C - Sensor Integration	C/CPFF	FLIR Systems Inc. : Elkridge, MD	-	2.976	Jun 2022	0.000		0.000		-		0.000	0.000	2.976	0.000
CSIRP - HW C - RN Sensor Prototype and Integration	C/FFP	Radiation Monitoring Devices, Inc : Boston, MA	0.615	0.030	May 2022	0.000		0.000		-		0.000	0.000	0.645	0.000
CSIRP - SW C - Sensor Integration	C/CPFF	Charles Stark Draper Laboratories, Inc. : Cambridge, MA	1.500	2.624	Nov 2021	0.000		0.000		-		0.000	0.000	4.124	0.000
CSIRP - HW C - Chemical Sensor Prototype and Integration	C/FFP	Intelligent Optical Systems (IOS) : Torrance, CA	0.485	0.239	Nov 2021	0.000		0.000		-		0.000	0.000	0.724	0.000
CSIRP - SW C - UAS and Sensor Manufacturing and Design	C/CPFF	T2S Solutions (T2S, LLC) : Belcamp, MD	1.687	1.600	Dec 2021	0.000		0.000		-		0.000	0.000	3.287	0.000
JBTDS - HW C - EMD Contract Award	C/CPIF	Chemring Detection Systems, Inc. : Charlotte, NC	37.021	3.898	Dec 2021	0.000		0.000		-		0.000	0.000	40.919	0.000
JBTDS - HW C - Program Team Labor	MIPR	Various : N/A	28.547	1.659	Nov 2021	0.000		0.000		-		0.000	0.000	30.206	0.000

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Chemical and Biological Defense Program **Date:** March 2023

Appropriation/Budget Activity 0400 / 5	R-1 Program Element (Number/Name) PE 0604384BP / Chemical and Biological Defense Program - EMD	Project (Number/Name) CA5 / Contamination Avoidance (SDD)
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Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
JBTDS - HW C - JHBI	C/CPFF	Biomeme : Philadelphia, PA	1.752	0.562	Mar 2022	0.000		0.000		-		0.000	0.000	2.314	0.000
NBCRV SSU - HW C - Government Product Development Team Labor	MIPR	U.S. Army Combat Capabilities Development Command (DEVCOM) Chemical Biological Center (CBC) : Aberdeen Proving Ground, MD	-	2.590	Dec 2021	0.000		0.000		-		0.000	0.000	2.590	0.000
NBCRV SSU - SW C - Integration	C/FFP	FLIR Systems Inc. : Elkridge, MD	-	2.830	Dec 2021	0.000		0.000		-		0.000	0.000	2.830	0.000
NBCRV SSU - HW C - Chemical Surface Detector Development	C/CPFF	FLIR Systems Inc. : Elkridge, MD	-	2.733	Jan 2022	0.000		0.000		-		0.000	0.000	2.733	0.000
NBCRV SSU - HW C - Contractor Team Labor	C/FFP	Various : N/A	-	0.896	Feb 2022	0.000		0.000		-		0.000	0.000	0.896	0.000
NBCRV SSU - SW C - Virtual Un-manned Platform Trainer	C/FFP	Various : N/A	-	0.898	Aug 2022	0.000		0.000		-		0.000	0.000	0.898	0.000
NBCRV SSU - HW C - cSDS On the Move	C/FFP	Various : N/A	-	2.774	Sep 2022	0.000		0.000		-		0.000	0.000	2.774	0.000
ROSETTA - HW C - Government Product Development Core Team Labor	MIPR	JPM CBRN Sensors, JPEO-CBRND : Aberdeen Proving Ground, MD	0.573	0.054	Nov 2022	0.000		0.000		-		0.000	0.000	0.627	0.000
Subtotal			161.259	48.157		0.000		0.000		-		0.000	0.197	209.613	N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Chemical and Biological Defense Program												Date: March 2023			
Appropriation/Budget Activity 0400 / 5						R-1 Program Element (Number/Name) PE 0604384BP / Chemical and Biological Defense Program - EMD						Project (Number/Name) CA5 / Contamination Avoidance (SDD)			

Support (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
AVCAD - ES C - OGA support (IPTs)	MIPR	Various : N/A	2.132	2.011	May 2022	0.000		0.000		-		0.000	0.000	4.143	0.000
CSIRP - ES C - Engineering Support	Various	Various : N/A	1.421	0.981	Dec 2021	0.000		0.000		-		0.000	0.000	2.402	0.000
JBTDs - Engineering Support	MIPR	Various : N/A	1.602	0.414	Jun 2022	0.000		0.000		-		0.000	0.000	2.016	0.000
JBTDs - OTA/OGA Service Representation	MIPR	Various : N/A	14.749	0.678	Mar 2022	0.000		0.000		-		0.000	0.000	15.427	0.000
NBCRV SSU - ILS C - Logistic Support	C/FFP	Various : N/A	-	0.938	Feb 2022	0.000		0.000		-		0.000	0.000	0.938	0.000
NBCRV SSU - ES C - Engineering Support	MIPR	Various : N/A	-	1.020	Apr 2022	0.000		0.000		-		0.000	0.000	1.020	0.000
NBCRV SSU - Stryker NBCRV Maintenance	C/FFP	General Dynamics Land Systems : Detroit, MI	-	2.154	Mar 2022	0.000		0.000		-		0.000	0.000	2.154	0.000
NBCRV SSU - ES C - Contract and Product Support	Various	Various : N/A	-	0.313	Dec 2021	0.000		0.000		-		0.000	0.000	0.313	0.000
Subtotal			19.904	8.509		0.000		0.000		-		0.000	0.000	28.413	N/A

Test and Evaluation (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
AET DEFENSE - OTHT C - Product Demonstration Events for Users	MIPR	Various : N/A	-	0.441	Feb 2022	0.000		0.000		-		0.000	0.000	0.441	0.000
AET DEFENSE - DTE S - Technology Assessments	Various	Various : N/A	-	0.745	Dec 2021	0.000		0.000		-		0.000	0.000	0.745	0.000
AVCAD - OTE C - DT/OT Chemical Chamber & Chemical Purchase for Chamber	MIPR	U.S. Army Combat Capabilities Development Command	5.833	2.092	Nov 2021	0.000		0.000		-		0.000	0.000	7.925	0.000

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Chemical and Biological Defense Program **Date:** March 2023

Appropriation/Budget Activity 0400 / 5	R-1 Program Element (Number/Name) PE 0604384BP / Chemical and Biological Defense Program - EMD	Project (Number/Name) CA5 / Contamination Avoidance (SDD)
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Test and Evaluation (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract	
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost				
		(DEVCOM) Chemical Biological Center (CBC) : Aberdeen Proving Ground, MD														
AVCAD - OTE C - DT/OT Test Activities	MIPR	Various : N/A	7.595	0.354	Jul 2022	0.000		0.000		-		0.000	0.000	7.949	0.000	
MPCAD - DTE C - DT/OT Chemical Chamber Event	MIPR	West Desert Test Center : Dugway, UT	6.350	2.460	Jan 2022	0.000		0.000		-		0.000	0.000	8.810	0.000	
MPCAD - DTE C - Various	MIPR	Various : N/A	3.312	1.887	Jan 2022	0.000		0.000		-		0.000	0.000	5.199	0.000	
MPCAD - DTE C - Support	MIPR	Aberdeen Test Center (ATC) : Aberdeen Proving Ground, MD	2.264	0.457	Nov 2021	0.000		0.000		-		0.000	0.000	2.721	0.000	
CSIRP - DTE C - JHU-APL	MIPR	Johns Hopkins University - Applied Physics Lab : Laurel, MD	0.400	1.367	May 2022	0.000		0.000		-		0.000	0.000	1.767	0.000	
CSIRP - DTE C - Environmental Testing	Various	Various : N/A	0.574	1.177	Jun 2022	0.000		0.000		-		0.000	0.000	1.751	0.000	
JBTDS - DTE SB - V&V of JBTDS Military Utility Model	Various	Institute for Defense Analysis (IDA) : Alexandria, VA	0.875	0.285	Mar 2022	0.000		0.000		-		0.000	0.000	1.160	0.000	
JBTDS - DTE SB - ARCA Chamber and Record Test Support	C/FFP	Battelle Memorial Institute : Columbus, OH	1.564	0.380	Nov 2021	0.000		0.000		-		0.000	0.000	1.944	0.000	
JBTDS - DTE SB - Identifier Live Agent Trials / Developmental Testing	MIPR	Various : N/A	9.265	1.401	Nov 2021	0.000		0.000		-		0.000	14.788	25.454	0.000	
JBTDS - OTE S - Operational Assessment	MIPR	Various : N/A	1.799	0.080	Nov 2021	0.000		0.000		-		0.000	0.000	1.879	0.000	
NBCRV SSU - DTE C - Test and Evaluation	Various	Various : N/A	-	2.869	Mar 2022	0.000		0.000		-		0.000	0.000	2.869	0.000	

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Chemical and Biological Defense Program												Date: March 2023			
Appropriation/Budget Activity 0400 / 5						R-1 Program Element (Number/Name) PE 0604384BP / Chemical and Biological Defense Program - EMD						Project (Number/Name) CA5 / Contamination Avoidance (SDD)			

Test and Evaluation (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
NBCRV SSU - DTE C - Component Level Testing	MIPR	Various : N/A	-	3.789	Jan 2022	0.000		0.000		-		0.000	0.000	3.789	0.000
NBCRV SSU - DTE S - System Level Testing	MIPR	Various : N/A	-	1.472	Feb 2022	0.000		0.000		-		0.000	0.000	1.472	0.000
Subtotal			39.831	21.256		0.000		0.000		-		0.000	14.788	75.875	N/A

Management Services (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
AET DEFENSE - PM/MS S - IPT Support/Program Management	MIPR	JPEO Chem, Bio, Rad, and Nuc Defense (JPEO-CBRND) : Aberdeen Proving Ground, MD	-	0.081	Dec 2021	0.000		0.000		-		0.000	0.000	0.081	0.000
AVCAD - PM/MS S - Management Services	MIPR	Various : N/A	6.312	1.674	Nov 2021	0.000		0.000		-		0.000	0.000	7.986	0.000
MPCAD - PM/MS S - Program Management Support	MIPR	Various : N/A	10.492	1.159	Dec 2021	0.000		0.000		-		0.000	0.000	11.651	0.000
CSIRP - PM/MS C - PM/MS S Program Management Support	Various	Various : N/A	1.262	1.369	Oct 2021	0.000		0.000		-		0.000	0.000	2.631	0.000
JBTDS - PM/MS S - Program Management Support	MIPR	Various : N/A	21.756	0.333	Nov 2021	0.000		0.000		-		0.000	0.000	22.089	0.000
NBCRV SSU - PM/MS C - Program Management Support	MIPR	Various : N/A	-	2.275	Oct 2021	0.000		0.000		-		0.000	0.000	2.275	0.000
ROSETTA - PM/MS S - Program Management Support	MIPR	Various : N/A	0.870	0.154	Oct 2021	0.000		0.000		-		0.000	0.000	1.024	0.000
Subtotal			40.692	7.045		0.000		0.000		-		0.000	0.000	47.737	N/A

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Exhibit R-4, RDT&E Schedule Profile: PB 2024 Chemical and Biological Defense Program **Date:** March 2023

Appropriation/Budget Activity 0400 / 5	R-1 Program Element (Number/Name) PE 0604384BP / <i>Chemical and Biological Defense Program - EMD</i>	Project (Number/Name) CA5 / <i>Contamination Avoidance (SDD)</i>
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	FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027				FY 2028			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
CSIRP - OTA Award and Execution for Development Objectives Strategy #3																												
CSIRP - Test and Evaluation of Prototypes - Development Objectives Strategy #3																												
JBTDS - MS C-Milestone C																												
JBTDS - LRIP Contract Award																												
JBTDS - PVT																												
JBTDS - MOT&E																												
JBTDS - FRP-Full Rate Production Decision																												
JBTDS - FRP Award																												
JBTDS - IOC-Initial Operational Capability																												
NBCRV SSU - Component Test & System Level Test 1																												
NBCRV SSU - Modification Work Order IPR																												
NBCRV SSU - Design and Fabrication Phase 3 (CS2.2)																												
NBCRV SSU - Limited User Test (LUT)																												
NBCRV SSU - Design and Fabrication Phase 2 (CS2.1)																												
NBCRV SSU - Initial Operational Test and Evaluation (IOT&E)																												
NBCRV SSU - FRP-Full Rate Production Decision																												
ROSETTA - Testing & Demonstrations (M8)																												
ROSETTA - Engineering Design																												
ROSETTA - OTA Contract Award																												

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Chemical and Biological Defense Program		Date: March 2023
Appropriation/Budget Activity 0400 / 5	R-1 Program Element (Number/Name) PE 0604384BP / <i>Chemical and Biological Defense Program - EMD</i>	Project (Number/Name) CA5 / <i>Contamination Avoidance (SDD)</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
AET DEFENSE - Technology Assessments/Systems Engineering	1	2022	4	2028
AVCAD - EMD Contract	1	2022	2	2023
AVCAD - MS C-Milestone C	2	2023	2	2023
AVCAD - LRIP-Low Rate Initial Production	2	2023	1	2026
AVCAD - FRP-Full Rate Production Decision	1	2026	1	2026
AVCAD - IOC-Initial Operational Capability	2	2026	2	2026
MPCAD - DT&E-Developmental Test and Evaluation - EMD Contract/LRIP contract	1	2022	3	2024
MPCAD - MS C-Milestone C - Liquid / Solid MS C	3	2023	3	2023
MPCAD - LRIP-Low Rate Initial Production	3	2023	3	2024
MPCAD - MS C-Milestone C - Vapor / Quant MS C	2	2024	2	2024
MPCAD - FRP-Full Rate Production Decision	4	2024	4	2024
MPCAD - IOC-Initial Operational Capability	4	2027	4	2027
MPCAD - FOC-Full Operational Capability	4	2028	4	2028
CSIRP - Test and Evaluation of Prototypes - Development Objectives Strategy #1	1	2022	2	2023
CSIRP - Transition Decision - Development Objectives Strategy #1	3	2023	3	2023
CSIRP - OTA Award and Execution for Development Objectives Strategy #2	3	2023	3	2024
CSIRP - Test and Evaluation of Prototypes - Development Objectives Strategy #2	3	2023	3	2025
CSIRP - Transition Decision - Development Objectives Strategy #2	3	2025	3	2025
CSIRP - OTA Award and Execution for Development Objectives Strategy #3	3	2025	3	2028
CSIRP - Test and Evaluation of Prototypes -Development Objectives Strategy #3	4	2025	3	2028
JBTDS - MS C-Milestone C	3	2023	3	2023
JBTDS - LRIP Contract Award	4	2023	4	2023

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Chemical and Biological Defense Program **Date:** March 2023

Appropriation/Budget Activity 0400 / 5	R-1 Program Element (Number/Name) PE 0604384BP / <i>Chemical and Biological Defense Program - EMD</i>	Project (Number/Name) CA5 / <i>Contamination Avoidance (SDD)</i>
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Events	Start		End	
	Quarter	Year	Quarter	Year
JBTDS - PVT	3	2024	3	2024
JBTDS - MOT&E	4	2024	4	2024
JBTDS - FRP-Full Rate Production Decision	4	2025	4	2025
JBTDS - FRP Award	4	2025	4	2025
JBTDS - IOC-Initial Operational Capability	2	2028	2	2028
NBCRV SSU - Component Test & System Level Test 1	1	2022	1	2024
NBCRV SSU - Modification Work Order IPR	3	2023	3	2024
NBCRV SSU - Design and Fabrication Phase 3 (CS2.2)	1	2024	1	2025
NBCRV SSU - Limited User Test (LUT)	4	2023	1	2024
NBCRV SSU - Design and Fabrication Phase 2 (CS2.1)	1	2022	2	2022
NBCRV SSU - Initial Operational Test and Evaluation (IOT&E)	1	2026	2	2026
NBCRV SSU - FRP-Full Rate Production Decision	3	2026	3	2026
ROSETTA - Testing & Demonstrations (M8)	1	2022	2	2022
ROSETTA - Engineering Design	4	2022	2	2023
ROSETTA - OTA Contract Award	3	2022	4	2027

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Chemical and Biological Defense Program **Date:** March 2023

Appropriation/Budget Activity 0400 / 5	R-1 Program Element (Number/Name) PE 0604384BP / Chemical and Biological Defense Program - EMD	Project (Number/Name) CO5 / Collective Protection (SDD)
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COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
CO5: <i>Collective Protection (SDD)</i>	-	2.888	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.888
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-	-	-

A. Mission Description and Budget Item Justification

This project supports Engineering and Manufacturing Development and Low Rate Initial Production of Joint Service Chemical, Biological, and Radiological (CBR) Collective Protection (CP) systems that are smaller, lighter, less costly to produce and maintain, and more logistically supportable. CP systems provide spaces safe from the effects of CBR contamination enabling mission accomplishment in CBR environments.

Efforts included in this Project are:

- (1) Joint Expeditionary Collective Protection (JECF) Family of Systems

The Joint Expeditionary Collective Protection (JECF) program provides the Joint Expeditionary Forces a collective protection capability that is lightweight, compact, modular, and affordable. JECF is a family of systems, developed in two phases that will allow the application of CP to transportable soft-side shelters, enclosed spaces of opportunity and in remote austere locations as a standalone resource. Phase 1 includes standalone CP systems and kits that provide existing host platforms and structures with Chemical Biological Radiological Nuclear (CBRN) protection. Phase 2 includes kits that provide CBRN protection to other host platforms and structures that were not explicitly designed in Phase 1. JECF will be capable of protecting personnel groups of varying size, unencumbered by Individual Protective Equipment (IPE), from the effects of CB agents, Toxic Industrial Materials (TIMs), radiological particles, heat, dust, and sand. The employment of JECF will reduce the need for personnel and equipment decontamination and is a strategic deterrence against state adversaries and non-state actors from using weapons of mass destruction. FY22 is the last year of BA5 funding for this program.

B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2022	FY 2023	FY 2024
Title: 1) JECF	2.888	-	-
Description: Phase 2 system Development and Demonstration Events			
Accomplishments/Planned Programs Subtotals	2.888	-	-

C. Other Program Funding Summary (\$ in Millions)

N/A

Remarks

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Chemical and Biological Defense Program		Date: March 2023
Appropriation/Budget Activity 0400 / 5	R-1 Program Element (Number/Name) PE 0604384BP / <i>Chemical and Biological Defense Program - EMD</i>	Project (Number/Name) CO5 / <i>Collective Protection (SDD)</i>

D. Acquisition Strategy

JOINT EXPEDITIONARY COLLECTIVE PROTECTION (JECPC)

JECPC Family of Systems (FoS) (Phase 1 and Phase 2) involves multiple contract types throughout the Engineering and Manufacturing Development (EMD) and Production and Deployment Phases of the program. Having achieved a Full Rate Production (FRP) decision for Phase 1 Systems in December 2016, the program exercised Fixed Price Incentive (FPI) production options in FY17 & FY18 through the now expired contract with Leidos in support of Initial Operational Capability (IOC). A competitive build-to print follow-on production delivery order contract was awarded June 2019 to Production Products Manufacturing and will support the remaining production of Phase 1 Systems to meet Full Operational Capability (FOC). Phase 2 systems were developed as engineering changes to the Phase 1 systems under a separate competitive delivery order awarded March 2019 to Leidos. Phase 2 systems underwent limited developmental and operational testing which led to a successful FRP decision. Production options are included in the delivery order to meet FOC for Phase 2 systems.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Chemical and Biological Defense Program **Date:** March 2023

Appropriation/Budget Activity 0400 / 5	R-1 Program Element (Number/Name) PE 0604384BP / Chemical and Biological Defense Program - EMD	Project (Number/Name) CO5 / Collective Protection (SDD)
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Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
JECP - HW S - Phase 2 System Product Development/Phase 2 Prototype Manufacturing	C/VariouS	Leidos : Abingdon, MD	8.819	0.854	Nov 2021	0.000		0.000		-		0.000	0.000	9.673	0.000
Subtotal			8.819	0.854		0.000		0.000		-		0.000	0.000	9.673	N/A

Support (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
JECP - DTE C - ES S/LS S - Engineering, Logistics, Technical, IPT Support	MIPR	Various : N/A	6.451	1.119	Nov 2021	0.000		0.000		-		0.000	0.000	7.570	0.000
Subtotal			6.451	1.119		0.000		0.000		-		0.000	0.000	7.570	N/A

Test and Evaluation (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
JECP - OTHS SB - Test & Evaluation IPT/OTE S - Operational Testing/DTE S - Phase 2 Developmental testing	MIPR	Various : N/A	12.442	0.700	Dec 2021	0.000		0.000		-		0.000	0.000	13.142	0.000
Subtotal			12.442	0.700		0.000		0.000		-		0.000	0.000	13.142	N/A

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Exhibit R-4, RDT&E Schedule Profile: PB 2024 Chemical and Biological Defense Program		Date: March 2023
Appropriation/Budget Activity 0400 / 5	R-1 Program Element (Number/Name) PE 0604384BP / <i>Chemical and Biological Defense Program - EMD</i>	Project (Number/Name) CO5 / <i>Collective Protection (SDD)</i>

	FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027				FY 2028			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
JECP - FRP-Full Rate Production Decision - Phase 2	■																											
JECP - IOC-Initial Operational Capability - IOC					■																							
JECP - FOC-Full Operational Capability - FOC																					■							

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Chemical and Biological Defense Program		Date: March 2023
Appropriation/Budget Activity 0400 / 5	R-1 Program Element (Number/Name) PE 0604384BP / <i>Chemical and Biological Defense Program - EMD</i>	Project (Number/Name) CO5 / <i>Collective Protection (SDD)</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
JECP - FRP-Full Rate Production Decision - Phase 2	2	2022	2	2022
JECP - IOC-Initial Operational Capability - IOC	2	2023	2	2023
JECP - FOC-Full Operational Capability - FOC	4	2028	4	2028

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Chemical and Biological Defense Program **Date:** March 2023

Appropriation/Budget Activity 0400 / 5	R-1 Program Element (Number/Name) PE 0604384BP / <i>Chemical and Biological Defense Program - EMD</i>	Project (Number/Name) DE5 / <i>Decontamination (SDD)</i>
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COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
DE5: <i>Decontamination (SDD)</i>	-	7.485	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	7.485
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-	-	-

A. Mission Description and Budget Item Justification

This project supports the development of Contamination Mitigation (ConMit) systems utilizing solutions that remove and/or detoxify contaminated material without damaging combat equipment, platforms, personnel, or the environment, helping sustain a resilient force posture, one of the efforts outlined in the National Defense Strategy. ConMit systems provide a force restoration capability for units that become contaminated. Development efforts will provide systems that reduce operational impact and logistics burden, reduce sustainment costs, increase safety, and minimize environmental effects associated with decontamination and contamination mitigation operations. Experimentation and demonstration will be used in this phase to reduce risk and inform supporting materiel solutions, Concept of Operations and Tactics, Techniques & Procedures. After FY 2022, the Chemical Biological Defense Program (CBDP) RDT&E Projects were restructured to align with the CBDP portfolio construct. DE5 efforts in FY 2022 progress to Projects EN5 and MT5. This restructuring provides standardization and alignment across CBDP research, development and acquisition efforts.

Efforts included in this Project are:

- (1) Decontamination Family of Systems (DFoS) Contamination Indicator Decontamination Assurance System (CIDAS) Blister **Progresses to MT5 in FY2023**,
- (2) Forward Area Mobility Spray - System (FAMS-S) **Progresses to MT5 in FY2023**, and
- (3) Major Defense Acquisition Program (MDAP) **Progresses to EN5 in FY2023**

The Decontamination Family of Systems Contamination Indicator Decontamination Assurance System (DFoS CIDAS) Blister program addresses traditional blister agents, two separate threat scenarios that require different materiel solutions, modernizing a key capability to help build a more lethal force, as outlined in the National Defense Strategy. In FY24, the program will conduct a Manufacturing Readiness Assessment (MRA) and a Physical Configuration Audit (PCA) with the Prime Contractor and complete Operational Testing in support of Full Rate Production (FRP)/Fielding Decision.

The FAMS-S will provide Special Operations Forces (SOF) and SOF Task Forces (SOTFs) with transportable, rapidly-deployable decontamination systems in three variants: man-portable, small vehicle-mounted, and large vehicle-mounted systems to rapidly decontaminate chemical and biological (CB) agents from the exterior of vehicles and support equipment to a level that is clean enough for re-use during missions without the need for donning CB personal protective equipment. This will maximize tactical flexibility and fighting strength while minimizing the logistical burden and the cost of conducting Countering Weapons of Mass Destruction (CWMD) and CB operations. FAMS-S is a Middle Tier Acquisition (MTA) program.

The MDAP Chemical Biological Radiological and Nuclear (CBRN) Survivability Initiative ensures weapon system programs at all Acquisition Category (ACAT) levels, as well as non-DoD agency programs such as those at the Department of Homeland Security (DHS), meet their CBRN defense requirements. In FY24, this effort continues

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Chemical and Biological Defense Program **Date:** March 2023

Appropriation/Budget Activity 0400 / 5	R-1 Program Element (Number/Name) PE 0604384BP / <i>Chemical and Biological Defense Program - EMD</i>	Project (Number/Name) DE5 / <i>Decontamination (SDD)</i>
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to facilitate and coordinate the research, development, test and evaluation, procurement, delivery, and life cycle sustainment of affordable CBRN defense materiel solutions for each program's documented CBRN requirements.

B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2022	FY 2023	FY 2024
Title: 1) DFoS CIDAS BLISTER	2.564	-	-
Description: Blister Indicator Kits and Large Scale Applicators (LSA)			
Title: 2) FAMS-S	2.681	-	-
Description: Small and large variant prototype development and close out of remaining DT/OT activities will complete.			
Title: 3) MDAP	2.240	-	-
Description: CBRN Survivability Support			
Accomplishments/Planned Programs Subtotals			
	7.485	-	-

C. Other Program Funding Summary (\$ in Millions)

<u>Line Item</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u> <u>Base</u>	<u>FY 2024</u> <u>OCO</u>	<u>FY 2024</u> <u>Total</u>	<u>FY 2025</u>	<u>FY 2026</u>	<u>FY 2027</u>	<u>FY 2028</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
• DE4: <i>Decontamination (ACD&P)</i>	14.747	-	-	-	-	-	-	-	-	0.000	14.747
• EN5: <i>Enabling Investments (SDD)</i>	-	13.392	13.835	-	13.835	13.884	14.179	14.197	14.261	Continuing	Continuing
• MT5: <i>Mitigate (SDD)</i>	-	74.225	88.441	-	88.441	92.279	91.431	87.773	93.250	Continuing	Continuing
• JD0050: <i>Decontamination Family Of Systems (DFoS)</i>	7.797	4.795	6.062	-	6.062	8.673	8.820	16.518	5.996	Continuing	Continuing
• PHM025: <i>Forward Air Mobility Spray System (FAMS-S)</i>	-	4.607	4.824	-	4.824	4.724	4.724	4.724	4.889	Continuing	Continuing

Remarks

D. Acquisition Strategy

DFoS CONTAMINATION INDICATOR DECON ASSURANCE SPRAY BLISTER (DFoS CIDAS BLISTER)

The Decontamination Family of Systems Contamination Indicator Detection Assurance System (DFoS CIDAS) Blister program will follow an evolutionary acquisition strategy. The program office coordinated with Science and Technology efforts to identify blister technologies that met Service requirements. After further development, in 4QFY19 a sole-source performance based indefinite delivery indefinite quantity contract was awarded to develop blister indicator and small scale applicator systems with options for production. The program will leverage the contract to procure blister indicator kits and conduct test and evaluation events for the Engineering & Manufacturing Development (EMD) phase in preparation of Milestone C/Full Rate Production (FRP).

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Chemical and Biological Defense Program		Date: March 2023
Appropriation/Budget Activity 0400 / 5	R-1 Program Element (Number/Name) PE 0604384BP / <i>Chemical and Biological Defense Program - EMD</i>	Project (Number/Name) DE5 / <i>Decontamination (SDD)</i>

FORWARD AREA MOBILITY SPRAY SYSTEM (FAMS-S)

The FAMS-S will be developed using Middle Tier Acquisition (MTA) to advance decontamination technology and capability for Special Operations Forces (SOF) and Special Operations Task Forces (SOTF) application to tactical and strategic platforms in accordance with MTA authorities and regulations and the Capability Development Document (CDD). FAMS-S will reduce technological risk by reviewing existing materials and technologies as well as designs, configurations, and test data from mature legacy and commercial decontamination systems. The program will utilize the CWMD Other Transaction Authority (OTA) agreement to competitively award projects to three vendors for the man-portable and three vendors for the vehicle-mounted variants followed by a prototype down-select. The program will perform technical evaluations, undergo developmental and operational testing, and early user assessments to inform the final prototype design across each variant in preparation for the man-portable variant production decision in FY23.

MAJOR DEFENSE ACQUISITION PROGRAM (MDAP)

The MDAP program will leverage JPEO-CBRN expertise and product portfolios to provide non-CBD programs with CBRN Survivability and Force Protection capabilities

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Chemical and Biological Defense Program **Date:** March 2023

Appropriation/Budget Activity 0400 / 5	R-1 Program Element (Number/Name) PE 0604384BP / <i>Chemical and Biological Defense Program - EMD</i>	Project (Number/Name) DE5 / <i>Decontamination (SDD)</i>
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Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
DFoS CIDAS BLISTER - HW S - Small Scale / Large Scale Applicators/ Kits	SS/ Various	FLIR Systems, Inc. : Stillwater, OK	2.269	0.624	Nov 2021	0.000		0.000		-		0.000	0.000	2.893	0.000
FAMS-S - HW S - System Development and Prototype Refinement	C/CPIF	ATI Solutions, Inc. : Tysons Corner, VA	0.876	0.686	Jan 2022	0.000		0.000		-		0.000	0.000	1.562	0.000
Subtotal			3.145	1.310		0.000		0.000		-		0.000	0.000	4.455	N/A

Support (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
DFoS CIDAS BLISTER - ES S - IPT and Technical Support	MIPR	Various : N/A	0.980	0.385	Dec 2021	0.000		0.000		-		0.000	0.000	1.365	0.000
FAMS-S - ES S - Systems Engineer/Technical SME Support	MIPR	Various : N/A	0.272	0.686	Jan 2022	0.000		0.000		-		0.000	0.000	0.958	0.000
MDAP - TD/D SB - IPT and Technical Support	MIPR	Various : N/A	2.480	2.081	Nov 2021	0.000		0.000		-		0.000	0.000	4.561	0.000
Subtotal			3.732	3.152		0.000		0.000		-		0.000	0.000	6.884	N/A

Test and Evaluation (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
DFoS CIDAS BLISTER - OTHS - OTHS - DT/OT	MIPR	Various : N/A	1.003	1.363	Dec 2021	0.000		0.000		-		0.000	0.000	2.366	0.000
FAMS-S - DTE SB - Decon Solution Analysis	Various	TBD : N/A	0.100	1.042	Feb 2022	0.000		0.000		-		0.000	0.000	1.142	0.000

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Exhibit R-4, RDT&E Schedule Profile: PB 2024 Chemical and Biological Defense Program **Date:** March 2023

Appropriation/Budget Activity 0400 / 5	R-1 Program Element (Number/Name) PE 0604384BP / <i>Chemical and Biological Defense Program - EMD</i>	Project (Number/Name) DE5 / <i>Decontamination (SDD)</i>
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FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027				FY 2028			
1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4

DFoS CIDAS BLISTER - Sustainment Cost Reduction Plan (SCRCP)	██████████																										
DFoS CIDAS BLISTER - DT&E-Developmental Test and Evaluation - Phase 1	██████████																										
DFoS CIDAS BLISTER - System Verification Review (SVR)/Production Readiness Review						██																					
DFoS CIDAS BLISTER - Functional Configuration Audit (FCA)							██																				
DFoS CIDAS BLISTER - DT&E-Developmental Test and Evaluation - Phase 2										██████████																	
DFoS CIDAS BLISTER - OT&E-Operational Test and Evaluation - CIDAS Blister										██																	
DFoS CIDAS BLISTER - Manufacturing Readiness Assessment										██																	
DFoS CIDAS BLISTER - Physical Configuration Audit										██																	
DFoS CIDAS BLISTER - MS C-Milestone C																											
DFoS CIDAS BLISTER - FRP-Full Rate Production Decision																											
DFoS CIDAS BLISTER - IOC-Initial Operational Capability																											
DFoS CIDAS BLISTER - FOC-Full Operational Capability - CIDAS Blister																											
FAMS-S - PDR-Preliminary Design Review - Man-Portable Variant			██																								
FAMS-S - CDR-Critical Design Review - Man-Portable Variant							██																				

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Exhibit R-4, RDT&E Schedule Profile: PB 2024 Chemical and Biological Defense Program **Date:** March 2023

Appropriation/Budget Activity 0400 / 5	R-1 Program Element (Number/Name) PE 0604384BP / <i>Chemical and Biological Defense Program - EMD</i>	Project (Number/Name) DE5 / <i>Decontamination (SDD)</i>
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	FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027				FY 2028			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
FAMS-S - MTA Outcome Decision Memorandum-Middle Tier Acquisition Outcome Decision Memorandum - Man-Portable Variant							■																					
FAMS-S - OT&E-Operational Test and Evaluation - Man-Portable Variant							■																					
FAMS-S - PDR-Preliminary Design Review - Small/Large Variants				■																								
FAMS-S - OT&E-Operational Test and Evaluation - Small/Large Variants											■																	
FAMS-S - CDR-Critical Design Review - Small/Large Variants												■																
FAMS-S - MTA Outcome Decision Memorandum-Middle Tier Acquisition Outcome Decision Memorandum - Small/Large Variants												■																
FAMS-S - IOC-Initial Operational Capability - All Variants																■												
FAMS-S - FOC-Full Operational Capability - All Variants																												■
MDAP - Engage with services to develop relationships for CBRN requirements																												

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Chemical and Biological Defense Program		Date: March 2023
Appropriation/Budget Activity 0400 / 5	R-1 Program Element (Number/Name) PE 0604384BP / <i>Chemical and Biological Defense Program - EMD</i>	Project (Number/Name) DE5 / <i>Decontamination (SDD)</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
DFoS CIDAS BLISTER - Sustainment Cost Reduction Plan (SCRP)	1	2022	3	2022
DFoS CIDAS BLISTER - DT&E-Developmental Test and Evaluation - Phase 1	2	2022	4	2022
DFoS CIDAS BLISTER - System Verification Review (SVR)/Production Readiness Review	3	2023	3	2023
DFoS CIDAS BLISTER - Functional Configuration Audit (FCA)	4	2023	4	2023
DFoS CIDAS BLISTER - DT&E-Developmental Test and Evaluation - Phase 2	1	2024	1	2025
DFoS CIDAS BLISTER - OT&E-Operational Test and Evaluation - CIDAS Blister	1	2024	1	2024
DFoS CIDAS BLISTER - Manufacturing Readiness Assessment	1	2024	1	2024
DFoS CIDAS BLISTER - Physical Configuration Audit	2	2024	2	2024
DFoS CIDAS BLISTER - MS C-Milestone C	4	2024	4	2024
DFoS CIDAS BLISTER - FRP-Full Rate Production Decision	4	2024	4	2024
DFoS CIDAS BLISTER - IOC-Initial Operational Capability	2	2027	2	2027
DFoS CIDAS BLISTER - FOC-Full Operational Capability - CIDAS Blister	2	2028	2	2028
FAMS-S - PDR-Preliminary Design Review - Man-Portable Variant	3	2022	3	2022
FAMS-S - CDR-Critical Design Review - Man-Portable Variant	2	2023	2	2023
FAMS-S - MTA Outcome Decision Memorandum-Middle Tier Acquisition Outcome Decision Memorandum - Man-Portable Variant	3	2023	3	2023
FAMS-S - OT&E-Operational Test and Evaluation - Man-Portable Variant	2	2023	2	2023
FAMS-S - PDR-Preliminary Design Review - Small/Large Variants	4	2022	4	2022
FAMS-S - OT&E-Operational Test and Evaluation - Small/Large Variants	2	2024	2	2024
FAMS-S - CDR-Critical Design Review - Small/Large Variants	3	2024	3	2024
FAMS-S - MTA Outcome Decision Memorandum-Middle Tier Acquisition Outcome Decision Memorandum - Small/Large Variants	3	2024	3	2024

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Chemical and Biological Defense Program **Date:** March 2023

Appropriation/Budget Activity 0400 / 5	R-1 Program Element (Number/Name) PE 0604384BP / <i>Chemical and Biological Defense Program - EMD</i>	Project (Number/Name) DE5 / <i>Decontamination (SDD)</i>
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Events	Start		End	
	Quarter	Year	Quarter	Year
FAMS-S - IOC-Initial Operational Capability - All Variants	3	2024	2	2026
FAMS-S - FOC-Full Operational Capability - All Variants	4	2028	4	2028
MDAP - Engage with services to develop relationships for CBRN requirements	1	2022	4	2028

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Chemical and Biological Defense Program **Date:** March 2023

Appropriation/Budget Activity 0400 / 5	R-1 Program Element (Number/Name) PE 0604384BP / <i>Chemical and Biological Defense Program - EMD</i>	Project (Number/Name) IP5 / <i>Individual Protection (SDD)</i>
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COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
IP5: <i>Individual Protection (SDD)</i>	-	18.690	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	18.690
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-	-	-

A. Mission Description and Budget Item Justification

This project provides Engineering & Manufacturing Development Phase and Low Rate Initial Production (EMD/LRIP) for individual protection equipment, with the goal of providing equipment that allows the individual Soldier, Sailor, Airman, or Marine to operate in a contaminated Nuclear, Biological and Chemical (NBC) environment with little or no degradation of his/her performance. After FY 2022, the Chemical Biological Defense Program (CBDP) RDT&E Projects were restructured to align with the CBDP portfolio construct. IP5 efforts in FY 2022 progress to Projects PT5 and UN5. This restructuring provides standardization and alignment across CBDP research, development and acquisition efforts.

Efforts included in this Project are:

- (1) Joint Service Aircrew Mask for Strategic Aircraft (JSAM SA),
- (2) Special Purpose Unit Rapid Capability Development and Deployment (SPU RCDD) - ****Progresses to UN5 in FY2023****,
- (3) UIPE FoS General Purpose (GP) - ****Progresses to PT5 in FY2023****, and
- (4) UIPE FoS Air - ****Progresses to PT5 in FY2023****

Joint Service Aircrew Mask (JSAM) Strategic Aircraft (SA) will provide individual respiratory, ocular, and percutaneous protection of chemical and biological warfare agents, and select toxic industrial chemicals for United States Air Force (USAF), Aeromedical personnel, United States Navy (USN), United States Marine Corps (USMC), and United States Army (USA) strategic aircrew. The mask components will be optimized to minimize their impact on the wearer's performance to continue lethality in a chemical biological (CB) environment and maximize its ability to interface with aircrew protective clothing. JSAM SA will provide pressure breathing for altitude for aircraft that do not require pressure breathing for gravity. JSAM SA will integrate with aircraft subsystems which include aviation life support equipment, aircrew flight equipment, aircraft seating, portable aircrew systems, communications systems, and aircraft oxygen systems. FY22 is the last year of BA5 funding for this program as they approach FOC in FY25.

SPU RCDD facilitates Joint Special Operations Command (JSOC) rapid response requirements to near-term and emergent chemical-biological defensive capabilities. This includes select elements from across the Special Operations Force (SOF) Enterprise such as CBRN Assessment Response Teams (CARTs) and other Joint Force enabling units such as the 20th Chemical, Biological, Radiological, Nuclear and Explosives Command. SPU RCDD mitigates risk across the Chemical Biological Defense Program (CBDP) by creating a portfolio of operationally-relevant CB capabilities that can be quickly transitioned in response to the articulated, emergent capability needs of the geographic combatant commanders. These objectives are met by the early transitioning of promising science and technologies (S&T); the focused conduct of combat evaluations and mission-oriented operational assessments to assess technological and mission suitability; and the active leveraging of existing Commercial-Off-The-Shelf (COTS) and Government-Off-The-Shelf (GOTS) products along with novel redesign approaches to optimize existing solutions to new challenges supported by "buy-try-decide-acquire" acquisition strategies. SPU RCDD initiates efforts such as respiratory breathing systems, biological identification,

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Chemical and Biological Defense Program **Date:** March 2023

Appropriation/Budget Activity 0400 / 5	R-1 Program Element (Number/Name) PE 0604384BP / <i>Chemical and Biological Defense Program - EMD</i>	Project (Number/Name) IP5 / <i>Individual Protection (SDD)</i>
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unmanned aerial and ground platform sensor integration, development of enhanced and augmented reality systems, and modernization of protective Chemical and Biological ensembles that have gone through requirements validation and continues product enhancement development and technology upgrades on currently fielded SOF equipment to counter emerging threats.

The Uniform Integrated Protective Ensemble Family of Systems General Purpose (UIPE FoS GP) is part of a family of systems that will give the Warfighter percutaneous protection from operationally relevant traditional, non-traditional, and advanced Chemical, Biological, Radiological and Nuclear (CBRN)/Toxic Industrial Material (TIM) threats likely to be encountered during joint force operations. The legacy chemical biological garment is nearing the end of its service life and does not meet updated requirements such as emerging threats, aerosol protection, and flame resistance. The UIPE FoS GP is a two-piece lightweight (compared to the legacy system) duty uniform replacement that has an aerosol liner, is flame resistant, and does not reduce Warfighter effectiveness in the areas of mobility and thermal burden. In FY24, the program will conduct a Multi Service Operational Test and Evaluation (MOT&E) and continue low rate production.

The Tactical All-Hazards Threat Protective Ensemble (TATPE) will provide high risk Special Operations Forces (SOF) and Explosive Ordnance Disposal (EOD) personnel with increased protection against non-traditional and advanced threat agents during CWMD crisis and response missions in a more athletic fit combining a level of protection and performance not previously available together. TATPE will capitalize on the protection factor of commercial Level A with design modifications to align with the necessary operational requirements. The TATPE is a system consisting of a protective garment that integrates with a Self-Contained Breathing Apparatus (SCBA), M53 protective mask, and cooling and hydration systems. The TATPE serves as an additional tool in the arsenal until technology matures to the point of delivering a similar capability applied against the range of military operations in all environments under all conditions. In FY22, the TATPE obtained a MS C Low Rate Initial Production/Full Rate Production decision and expects to achieve an Initial Operations Capability (IOC) for SOF, EOD, and Special Mission Units within SOCOM.

Uniform Integrated Protection Ensemble (UIPE) Family of Systems (FoS) Air program will provide the Warfighter percutaneous protection from operationally relevant traditional and non-traditional Chemical, Biological, Radiological, Nuclear (CBRN) threats. UIPE FoS Air will improve aircrew performance and survivability under CBRN conditions by reducing thermal burden and bulk, while increasing mobility and resulting in an increase operational effectiveness. The UIPE FoS Air program is composed of two variants. The UIPE FoS Air Chemical, Biological, Radiological Layer (CBRL) to address the specific requirements of the United States Air Force (USAF) tactical/ejection fixed wing platforms and the Two Piece Undergarment (2PUG) to address the remaining USAF and United States Navy / United States Marine Corps tactical/ejection seat (rotary wing) and non-ejection (fixed wing) platforms. FY23 is last year of BA5 funding, program is transitioning to production.

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2022	FY 2023	FY 2024
Title: 1) JSAM SA Description: Completed Operational Testing and Evaluation (OT&E)	1.005	-	-
Title: 2) SPU RCDD - Advanced Development Description: This line includes Product Development, Test and Evaluation, Management Services, and Support to mature technology across multiple commodity areas in order to rapidly field solutions in response to emergent threats.	4.478	-	-
Title: 3) UIPE FOS GP	9.349	-	-

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Chemical and Biological Defense Program **Date:** March 2023

Appropriation/Budget Activity 0400 / 5	R-1 Program Element (Number/Name) PE 0604384BP / Chemical and Biological Defense Program - EMD	Project (Number/Name) IP5 / Individual Protection (SDD)
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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2022	FY 2023	FY 2024
Description: Development of the next generation protective ensembles.			
Title: 4) UIPE FOS AIR	3.858	-	-
Description: Design, Test, and Integration of the Two Piece Undergarment (2PUG)			
Accomplishments/Planned Programs Subtotals	18.690	-	-

C. Other Program Funding Summary (\$ in Millions)

Line Item	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
• IP7: Individual Protection (Op Sys Dev)	11.659	-	-	-	-	-	-	-	-	0.000	11.659
• PT5: Protect (SDD)	-	87.923	97.975	-	97.975	69.858	66.259	52.871	67.776	Continuing	Continuing
• UN5: Understand (SDD)	-	126.071	182.726	-	182.726	137.991	127.671	108.908	68.088	Continuing	Continuing
• UN7: Understand (Op Sys Dev)	-	40.414	50.603	-	50.603	58.881	71.869	68.839	50.628	Continuing	Continuing
• JI0002: JS Aircrew Mask (JSAM)	29.744	20.823	-	-	-	-	-	-	-	0.000	105.077
• PHM018: SPU Rapid Capability Development And Demo (SPU RCDD)	10.834	9.914	49.455	-	49.455	20.689	20.180	24.216	26.638	Continuing	Continuing
• PHM032: Uniform Integrated Protective Ensemble FOS Gloves (UIPE FOS GLOVES)	-	-	4.978	-	4.978	6.215	7.974	8.328	8.926	Continuing	Continuing
• PHM033: Uniform Integrated Protective Ensemble General Purpose (UIPE FOS GP)	4.456	30.145	55.100	-	55.100	111.350	111.783	112.106	113.401	Continuing	Continuing
• PHM034: Uniform Integrated Protection Ensemble FOS Air (UIPE FOS AIR)	47.798	23.407	25.794	-	25.794	26.195	26.403	17.586	0.492	Continuing	Continuing

Remarks

D. Acquisition Strategy

JOINT SERVICE AIRCREW MASK STRATEGIC AIRCRAFT (JSAM SA)

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Chemical and Biological Defense Program		Date: March 2023
Appropriation/Budget Activity 0400 / 5	R-1 Program Element (Number/Name) PE 0604384BP / <i>Chemical and Biological Defense Program - EMD</i>	Project (Number/Name) IP5 / <i>Individual Protection (SDD)</i>
<p>The contract strategy consists of two sole-source contracts with Avon Protection Systems, the manufacturer of the fielded M53 mask. The first contract, which was awarded on 31 July 2013, covers all activities during the Engineering and Manufacturing Development (EMD) phase to include all LRIP builds. The second contract, which was awarded on 4 January 2019 to Avon Protection Systems, will cover the activities during the Production and Deployment (PD) phase including all Full Rate Production (FRP) builds for the Services.</p> <p>SPU RAPID CAPABILITY DEVELOPMENT AND DEPLOYMENT (SPU RCDD)</p> <p>The SPU RCDD overall acquisition strategy allows for rapid prototyping and testing of novel and modified COTS or GOTS systems against mission critical capabilities to enhance mission success. The SPU RCDD will use technical and functional evaluations of currently fielded items to identify materiel that requires modernization and incorporate operationally-relevant system developments. This will be accomplished through competitive contracting vehicles such as Multiple Award Indefinite Delivery Indefinite Quantify Task Order and the Countering Weapons of Mass Destruction Other Transaction Authority (CWMD OTA) for the development of prototype test assets. The SPU RCDD will use Government Agencies for prototype development, test and evaluation, and technical support.</p> <p>UNIFORM INTEGRATED PROTECTIVE ENSEMBLE GENERAL PURPOSE (UIPE FOS GP)</p> <p>The Uniform Integrated Protective Ensemble Family of Systems General Purpose (UIPE FoS GP) program used an Other Transaction Authority (OTA) and Government designed prototypes produced in conjunction with an Industry Partner to acquire prototypes for early user testing. Warfighter feedback, trade space analysis, and chemical testing resulted in three government designed candidates being down selected in 3QFY20. These three candidates are designed to minimize operational burden and provide improved form, fit, function, and integration with the current Warfighter kits compared to legacy systems. Additional testing, review of the results, stakeholder guidance, and a risk analysis led to the selection of two variants. During 3QFY22, one variant will be selected to enter the Operational Assessment and Developmental/Operational Testing. UIPE FoS GP will be executing multiple awards in the next 3 years, where production occurring before the milestone to allow for completion of UIPE evaluation (effectiveness, suitability and survivability) prior to award of a high ceiling production contract. This will allow the vendor to better estimate pricing (labor and material) with an initial production ramp up; and mitigates schedule risk for award of a high ceiling production contract.</p> <p>TATPE completed all EMD activities with FY21 RDT&E and transitioned to procurement in FY22.</p> <p>UNIFORM INTEGRATED PROTECTION ENSEMBLE FOS AIR (UIPE FOS AIR)</p> <p>The Uniform Integrated Protection Ensemble (UIPE) Family of Systems (FoS) Air utilizes a streamlined acquisition strategy that identifies mature technology and capitalizes on work accomplished by the United States Air Force (USAF) Integrated Aircrew Ensemble (IAE) and UIPE FoS General Purpose programs. The UIPE FoS Air will utilize an Milestone A-C acquisition strategy that will accelerate fielding to the Warfighter. The contract strategy leverages the USAF IAE Small Business Innovation Research (SBIR) Phase III contract to procure UIPE FoS Air Chemical, Biological, Radiological Layer (CBRL). The UIPE FoS Air Two Piece Undergarment (2PUG) will be procured utilizing a Government design on a separate contract.</p>		

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Chemical and Biological Defense Program **Date:** March 2023

Appropriation/Budget Activity 0400 / 5	R-1 Program Element (Number/Name) PE 0604384BP / Chemical and Biological Defense Program - EMD	Project (Number/Name) IP5 / Individual Protection (SDD)
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Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
SPU RCDD - HW C - Assault Respirator	Various	Various : N/A	0.564	0.046	Nov 2021	0.000		0.000		-		0.000	0.000	0.610	0.000
SPU RCDD - HW C - Prototype Procurement	Various	Various : N/A	4.239	1.780	Dec 2021	0.000		0.000		-		0.000	0.000	6.019	0.000
SPU RCDD - HW S - Low Temperature Plasma Mass Spectrometer (LTPMS)	C/CPFF	Advanced Technologies International : Summerville, SC	-	0.821	Jan 2022	0.000		0.000		-		0.000	0.000	0.821	0.000
Subtotal			4.803	2.647		0.000		0.000		-		0.000	0.000	7.450	N/A

Support (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
JSAM SA - TD/D S - Logistics, Engineering, and IPT Support	MIPR	Various : N/A	1.030	0.768	Nov 2021	0.000		0.000		-		0.000	0.000	1.798	0.000
SPU RCDD - ES C - Engineering Support	Various	Various : N/A	0.672	0.311	Dec 2021	0.000		0.000		-		0.000	0.000	0.983	0.000
UIPE FOS GP - ES C - Engineering & Technical IPT Support / SME Support	Various	Various : N/A	1.049	0.807	Nov 2021	0.000		0.000		-		0.000	0.000	1.856	0.000
UIPE FOS GP - ILS S - Integrated Log Support-System	Various	Various : N/A	-	0.595	Nov 2021	0.000		0.000		-		0.000	0.000	0.595	0.000
UIPE FOS AIR - ES S - Engineering and IPT Support	Various	Various : N/A	-	0.578	Nov 2021	0.000		0.000		-		0.000	0.000	0.578	0.000
Subtotal			2.751	3.059		0.000		0.000		-		0.000	0.000	5.810	N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Chemical and Biological Defense Program **Date:** March 2023

Appropriation/Budget Activity 0400 / 5	R-1 Program Element (Number/Name) PE 0604384BP / Chemical and Biological Defense Program - EMD	Project (Number/Name) IP5 / Individual Protection (SDD)
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Test and Evaluation (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
JSAM SA - DTE S - DT/OT	MIPR	Various : N/A	4.197	0.167	Nov 2021	0.000		0.000		-		0.000	0.000	4.364	0.000
SPU RCDD - DTE C - Testing and Evaluation	MIPR	U.S. Army Combat Capabilities Development Command (DEVCOM) Chemical Biological Center (CBC) : Aberdeen Proving Ground, MD	0.218	0.753	Dec 2021	0.000		0.000		-		0.000	0.000	0.971	0.000
UIPE FOS GP - DTE C - DT/OT	Various	Various : N/A	2.816	7.247	Nov 2021	0.000		0.000		-		0.000	0.000	10.063	0.000
UIPE FOS AIR - DTE C - System Level Testing	Various	Various : N/A	3.043	2.991	Nov 2021	0.000		0.000		-		0.000	0.000	6.034	0.000
Subtotal			10.274	11.158		0.000		0.000		-		0.000	0.000	21.432	N/A

Management Services (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
JSAM SA - PM/MS S - Program Management Support	MIPR	Various : N/A	1.846	0.070	Nov 2021	0.000		0.000		-		0.000	0.000	1.916	0.000
SPU RCDD - PM/MS C - Program Management Support	Various	Various : N/A	0.979	0.767	Nov 2021	0.000		0.000		-		0.000	0.000	1.746	0.000
UIPE FOS GP - PM/MS C - Program Management Support	Various	Various : N/A	0.673	0.700	Nov 2021	0.000		0.000		-		0.000	0.000	1.373	0.000
UIPE FOS AIR - PM/MS C - Program Management Services	MIPR	Various : N/A	0.269	0.289	Nov 2021	0.000		0.000		-		0.000	0.000	0.558	0.000
Subtotal			3.767	1.826		0.000		0.000		-		0.000	0.000	5.593	N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Chemical and Biological Defense Program									Date: March 2023				
Appropriation/Budget Activity 0400 / 5				R-1 Program Element (Number/Name) PE 0604384BP / Chemical and Biological Defense Program - EMD				Project (Number/Name) IP5 / Individual Protection (SDD)					
	Prior Years	FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	21.595	18.690		0.000		0.000		-		0.000	0.000	40.285	N/A

Remarks

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Exhibit R-4, RDT&E Schedule Profile: PB 2024 Chemical and Biological Defense Program		Date: March 2023
Appropriation/Budget Activity 0400 / 5	R-1 Program Element (Number/Name) PE 0604384BP / <i>Chemical and Biological Defense Program - EMD</i>	Project (Number/Name) IP5 / <i>Individual Protection (SDD)</i>

	FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027				FY 2028			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
JSAM SA - OT&E-Operational Test and Evaluation - DT/OT (Capability, Integration, Airworthiness Certification)	██████████																											
JSAM SA - FOC-Full Operational Capability													██████████															
SPU RCDD - Modernize CBRN Materiel	██████████				██████████				██████████				██████████				██████████				██████████							
SPU RCDD - Develop Modular Self Contained Breathing Apparatus (MSCBA)	██████████				██████████				██████████				██████████															
SPU RCDD - Develop Enhanced Warfighter Augmented Training (EWAT)	██████████				██████████				██████████				██████████															
SPU RCDD - Prototype Novel CBRN Equipment	██████████				██████████				██████████				██████████				██████████				██████████							
SPU RCDD - Develop Low Temperature Plasma Mass Spectrometer (LTPMS)	██████████				██████████				██████████				██████████															
SPU RCDD - Develop Optimized CBRN Hydration System (OCHS)	██████████				██████████				██████████																			
SPU RCDD - Develop Assault Respirator	██████████				██████████				██████████																			
SPU RCDD - Develop USSOCOM-specific UGV/UAS Sensor Integration	██████████				██████████				██████████																			
UIPE FOS GP - TATPE Technical Testing	██████████																											
UIPE FOS GP - MS C-Milestone C - TATPE			██████████																									
UIPE FOS GP - TATPE Production Contract Award			██████████																									
UIPE FOS GP - FRP-Full Rate Production Decision - TATPE			██████████																									
UIPE FOS GP - IOC-Initial Operational Capability - TATPE													██████████															

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Exhibit R-4, RDT&E Schedule Profile: PB 2024 Chemical and Biological Defense Program **Date:** March 2023

Appropriation/Budget Activity 0400 / 5	R-1 Program Element (Number/Name) PE 0604384BP / Chemical and Biological Defense Program - EMD	Project (Number/Name) IP5 / Individual Protection (SDD)
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	FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027				FY 2028			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
UIPE FOS GP - FOC-Full Operational Capability - TATPE																												
UIPE FOS GP - DT/OT																												
UIPE FOS GP - CDR-Critical Design Review																												
UIPE FOS GP - Production Initiation Contract																												
UIPE FOS GP - Operational Assessment																												
UIPE FOS GP - Manufacturing Readiness Assessment (MRA)																												
UIPE FOS GP - Joint Independent Logistics Assessment (JILA)																												
UIPE FOS GP - MS C-Milestone C																												
UIPE FOS GP - Capability Development Document (CDD) Update (if needed)																												
UIPE FOS GP - Production Contract Award																												
UIPE FOS GP - OT&E-Operational Test and Evaluation																												
UIPE FOS GP - FRP-Full Rate Production Decision																												
UIPE FOS GP - IOC-Initial Operational Capability																												
UIPE FOS AIR - Aircraft Integration Testing																												
UIPE FOS AIR - Swatch and System Level Testing																												
UIPE FOS AIR - Fixed Wing Ejection Aircraft Integration Testing																												
UIPE FOS AIR - Fixed Wing Non-Ejection Aircraft Testing																												

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Chemical and Biological Defense Program			Date: March 2023
Appropriation/Budget Activity 0400 / 5	R-1 Program Element (Number/Name) PE 0604384BP / <i>Chemical and Biological Defense Program - EMD</i>	Project (Number/Name) IP5 / <i>Individual Protection (SDD)</i>	

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
JSAM SA - OT&E-Operational Test and Evaluation - DT/OT (Capability, Integration, Airworthiness Certification)	1	2022	4	2022
JSAM SA - FOC-Full Operational Capability	2	2025	2	2025
SPU RCDD - Modernize CBRN Materiel	1	2022	4	2027
SPU RCDD - Develop Modular Self Contained Breathing Apparatus (MSCBA)	1	2022	4	2024
SPU RCDD - Develop Enhanced Warfighter Augmented Training (EWAT)	1	2022	4	2024
SPU RCDD - Prototype Novel CBRN Equipment	1	2022	4	2027
SPU RCDD - Develop Low Temperature Plasma Mass Spectrometer (LTPMS)	1	2022	4	2024
SPU RCDD - Develop Optimized CBRN Hydration System (OCHS)	1	2022	2	2023
SPU RCDD - Develop Assault Respirator	1	2022	4	2023
SPU RCDD - Develop USSOCOM-specific UGV/UAS Sensor Integration	1	2022	4	2023
UIPE FOS GP - TATPE Technical Testing	1	2022	2	2022
UIPE FOS GP - MS C-Milestone C - TATPE	3	2022	3	2022
UIPE FOS GP - TATPE Production Contract Award	4	2022	4	2022
UIPE FOS GP - FRP-Full Rate Production Decision - TATPE	4	2022	4	2022
UIPE FOS GP - IOC-Initial Operational Capability - TATPE	2	2024	2	2024
UIPE FOS GP - FOC-Full Operational Capability - TATPE	3	2025	3	2025
UIPE FOS GP - DT/OT	2	2022	3	2023
UIPE FOS GP - CDR-Critical Design Review	3	2022	3	2022
UIPE FOS GP - Production Initiation Contract	2	2023	2	2023
UIPE FOS GP - Operational Assessment	1	2024	1	2024
UIPE FOS GP - Manufacturing Readiness Assessment (MRA)	2	2023	2	2023

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Chemical and Biological Defense Program **Date:** March 2023

Appropriation/Budget Activity 0400 / 5	R-1 Program Element (Number/Name) PE 0604384BP / <i>Chemical and Biological Defense Program - EMD</i>	Project (Number/Name) IP5 / <i>Individual Protection (SDD)</i>
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Events	Start		End	
	Quarter	Year	Quarter	Year
UIPE FOS GP - Joint Independent Logistics Assessment (JILA)	3	2023	4	2023
UIPE FOS GP - MS C-Milestone C	4	2023	4	2023
UIPE FOS GP - Capability Development Document (CDD) Update (if needed)	4	2023	4	2023
UIPE FOS GP - Production Contract Award	1	2025	1	2025
UIPE FOS GP - OT&E-Operational Test and Evaluation	2	2024	2	2024
UIPE FOS GP - FRP-Full Rate Production Decision	1	2026	1	2026
UIPE FOS GP - IOC-Initial Operational Capability	4	2028	4	2028
UIPE FOS AIR - Aircraft Integration Testing	1	2022	2	2022
UIPE FOS AIR - Swatch and System Level Testing	1	2022	4	2022
UIPE FOS AIR - Fixed Wing Ejection Aircraft Integration Testing	1	2022	4	2023
UIPE FOS AIR - Fixed Wing Non-Ejection Aircraft Testing	1	2022	4	2023
UIPE FOS AIR - Rotary Wing Aircraft Integration Testing	1	2022	4	2023
UIPE FOS AIR - Prototype Development (2PUG)	1	2022	4	2022
UIPE FOS AIR - IOC-Initial Operational Capability - CBRL	2	2022	2	2022
UIPE FOS AIR - Human Factors Testing	3	2022	3	2022
UIPE FOS AIR - Safe to Fly Certification	4	2022	4	2023
UIPE FOS AIR - FOC-Full Operational Capability - CBRL	4	2022	4	2022
UIPE FOS AIR - Developmental/Operational Testing (DT/OT)	1	2022	4	2022
UIPE FOS AIR - Safe-to-Fly and Airworthiness Testing	1	2023	4	2023
UIPE FOS AIR - Capability Development Document (CDD) Update	2	2023	2	2023
UIPE FOS AIR - FRP-Full Rate Production Decision - 2PUG	2	2023	2	2023
UIPE FOS AIR - IOC-Initial Operational Capability - 2PUG	2	2024	2	2024
UIPE FOS AIR - FOC-Full Operational Capability - 2PUG	4	2028	4	2028

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Chemical and Biological Defense Program										Date: March 2023		
Appropriation/Budget Activity 0400 / 5					R-1 Program Element (Number/Name) PE 0604384BP / Chemical and Biological Defense Program - EMD				Project (Number/Name) MB5 / Medical Biological Defense (SDD)			
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
MB5: Medical Biological Defense (SDD)	-	138.156	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	138.156
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This Project supports Engineering and Manufacturing Development and Low Rate Initial Production (EMD/LRIP) of medical countermeasures, development of reagents, assays, diagnostic equipment, Biosurveillance and supporting efforts. After FY 2022, the Chemical Biological Defense Program (CBDP) RDT&E Projects were restructured to align with the CBDP portfolio construct. MB5 efforts in FY 2022 progress to Projects UN5, PT5, MT5 and EN5. This restructuring provides standardization and alignment across CBDP research, development and acquisition efforts.

Efforts included in this Project are:

- (1) Antiviral Therapeutics Program (AV TX) **Progresses to MT5 in FY2023**,
- (2) Botulinum Monoclonal Antibodies (BOT MAB) **Progresses to PT5 in FY2023**,
- (3) Chem Bio Incident Preparedness and Response - Advanced Development and Manufacturing (CBIPR - ADM) **Progresses to EN5 in FY2023**,
- (4) Countering Emerging Threats Rapid Acquisition and Investigation of Drugs for Repurposing (CET RAIDR) **Progresses to MT5 in FY2023**,
- (5) Defense Biological Products Assurance Program (DBPAP) **Progresses to UN5 in FY2023**,
- (6) Next Generation Diagnostic System (NGDS) 2 Chemical Diagnostic (NGDS 2 CHEMDX) **Progresses to UN5 in FY2023**,
- (7) Next Generation Diagnostic System (NGDS) 2 Man Portable Diagnostic System (NGDS 2 MPDS) **Progresses to UN5 in FY2023** , and
- (8) Special Immunizations Program (VAC SIP) **Progresses to PT5 in FY2023**

The Antiviral Therapeutics (AV TX) program will develop and deliver U.S. Food & Drug Administration (FDA) approved antiviral therapeutics for the warfighter. Based on the current gap in defense to the warfighter, the initial therapeutic candidate is now for a treatment against the Marburg virus in lieu of Ebola Zaire to follow for approval of a PanFilo therapeutic. Other pathogens on the biological warfare threat lists, include viruses of interest from Filoviridae, Arenaviridae, Bunyaviridae, and Flaviviridae. Developed broad spectrum antiviral therapeutics will be employed after suspected or confirmed exposure to the relevant threat agents and AV TX Medical Countermeasures (MCMs) will ameliorate the effect of threat agents to the warfighter. In the event of a natural occurring outbreak, antiviral therapeutics can be provided to ensure freedom of operation.

The Botulinum Monoclonal Antibodies (BOT MAB) program will provide protection from Botulinum neurotoxin (BoNT) which is classified by the Centers for Disease Control and Prevention (CDC) as a category A threat, one that poses the highest risk to the public and national security. This Medical Countermeasure (MCM) will prevent (pre-exposure) and reduce the incidence or progression of botulism disease, following exposure to BoNT serotypes A/B. The drug product contains a total of six monoclonal antibodies, three for BoNT type A and three for BoNT type B, and the planned route of administration is Intra-Muscular (IM) injection.

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Chemical and Biological Defense Program	Date: March 2023
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Appropriation/Budget Activity 0400 / 5	R-1 Program Element (Number/Name) PE 0604384BP / <i>Chemical and Biological Defense Program - EMD</i>	Project (Number/Name) MB5 / <i>Medical Biological Defense (SDD)</i>
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The CBIPR-ADM program ensures prioritization to domestic biopharmaceutical manufacturing capacities, capabilities, and infrastructure (e.g. the DoD-ADM Facility and other strategic partners) that are operationally ready to rapidly develop and manufacture medical countermeasures (MCMs) against current and emerging chemical and biological threats including pandemic response. Prioritization is achieved by establishing and enhancing proven biopharmaceutical manufacturing platform technologies and infrastructure at these facilities. Thus, these facilities will have the capability to accelerate development of MCMs at all stages of development, enhance preparedness for existing threats, and rapidly respond to emerging threats as part of a medical integrated layered defense. MCMs that benefit from these efforts include: Vaccines for Viral Agents, Vaccines for Bacterial Agents and Toxins, monoclonal antibodies, antibody fragments and conjugates for therapeutic and prophylactic use across all agent classes. Funds to support prioritization and operational readiness were previously provided via individual product development and manufacturing funding lines. The Department is now providing dedicated funds. The CBIPR-ADM return on investment is an increased level of preparedness and responsiveness. In FY24, the CBIPR-ADM program continues to establish and enhance new manufacturing platform technologies and infrastructure that will enable the development of MCMs against chemical and biological threats.

The Countering Emerging Threats Rapid Acquisition and Investigation of Drugs for Repurposing (CET RAIDR) program will develop repurposed drugs as medical countermeasures towards known, potential, and emerging threats, bridging the gap from when a threat is identified until targeted countermeasures such as vaccines are available. CET RAIDR will leverage lessons learned in Coronavirus Aid, Relief, and Economic Security (CARES) Act funded efforts under Coronavirus Disease (COVID) Repurposed Therapeutics (CR TX) to address repurposing of therapeutics. This effort will also use Enhanced Biodefense (ENBD) funding starting in FY23 to evaluate additional drugs candidates for repurposing.

The Defense Biological Product Assurance Program (DBPAP) serves as the principal resource of high quality, validated, and standardized biological detection assays and reagents that meet the requirements of the warfighter and Joint biological defense systems. DBPAP pursues an array of analytical tools to verify assay performance and predict effective medical countermeasure solutions that are critical to preparedness. The DBPAP enables an Ordering System for Critical Assays and Reagents (OSCAR), where multiple government agencies and customers can place orders, track order status, and monitor ordering history. In FY24 DBPAP will continue to support optimization and expansion of biological threat agents reference materials and assays to known and emerging threats.

The NGDS 2 ChemDx program will provide a rapid, hand-held, point-of-care device, for the quantitative detection of acetyl cholinesterase (AChE) levels in blood samples, an indicator of possible Nerve Agent exposure in individuals. NGDS 2 ChemDx will be employed by the Army, Air Force, Navy, Marines and SOCOM at multiple echelons of healthcare. NGDS 2 ChemDx test results are to be used to aid in the diagnosis and treatment of individuals suspected of having exposure to chemical nerve agents.

The NGDS 2 MPDS program will provide a simple-to-use, portable diagnostic device capability that can be used in austere battlefield environments to assist in the diagnosis of infectious diseases and biological warfare agents. The MPDS will enable earlier patient diagnosis, improve decision support for treatment, evacuation and command situational awareness, and mitigate the effects of exposure to unknown infectious disease and biological agents.

The SIP continually manages, updates, and executes the Investigational New Drugs (INDs) of selected prophylaxis, treatments and diagnostics development products which provide additional protection to individuals that are at high risk of exposure to CBRN agents. DoD has the mission to maintain IND vaccines in Good

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Chemical and Biological Defense Program **Date:** March 2023

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Manufacturing Practice (GMP) storage and to conduct the periodic potency and stability testing of these materials to support submissions to the FDA. In FY23 SIP continues storage of product until destruction. VAC SIP restructures to the Rapid Access to Products in Development (RAPID) program in FY24.

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2022	FY 2023	FY 2024
Title: 1) AV TX Description: Enabling Technologies	14.152	-	-
Title: 2) BOT MAB Description: Clinical and Nonclinical Studies	26.364	-	-
Title: 3) BOT MAB Description: Manufacturing	33.000	-	-
Title: 4) CBIPR-ADM Description: ADM Infrastructure	10.131	-	-
Title: 5) CET RAIDR Description: Advance Development	7.708	-	-
Title: 6) CET RAIDR Description: Pandemic Preparedness	11.500	-	-
Title: 7) DBPAP Description: Development	7.588	-	-
Title: 8) NGDS 2 CHEMDX Description: Engineering & Manufacturing Development	2.693	-	-
Title: 9) NGDS 2 CHEMDX Description: Product Management	2.126	-	-
Title: 10) NGDS 2 MPDS Description: Product Development	13.437	-	-

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Chemical and Biological Defense Program **Date:** March 2023

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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2022	FY 2023	FY 2024
Title: 11) NGDS 2 MPDS Description: Program Management and Support	2.974	-	-
Title: 12) VAC SIP Description: Storage, Distribution, Potency Testing	6.483	-	-
Accomplishments/Planned Programs Subtotals			
	138.156	-	-

C. Other Program Funding Summary (\$ in Millions)											
Line Item	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
• EN4: <i>Enabling Investments (ACD&P)</i>	-	6.781	47.272	-	47.272	51.579	9.792	9.840	9.840	Continuing	Continuing
• EN5: <i>Enabling Investments (SDD)</i>	-	13.392	13.835	-	13.835	13.884	14.179	14.197	14.261	Continuing	Continuing
• MT5: <i>Mitigate (SDD)</i>	-	74.225	88.441	-	88.441	92.279	91.431	87.773	93.250	Continuing	Continuing
• PT4: <i>Protect (ACD&P)</i>	-	175.219	179.158	-	179.158	135.096	107.341	123.538	139.376	Continuing	Continuing
• PT5: <i>Protect (SDD)</i>	-	87.923	97.975	-	97.975	69.858	66.259	52.871	67.776	Continuing	Continuing
• UN5: <i>Understand (SDD)</i>	-	126.071	182.726	-	182.726	137.991	127.671	108.908	68.088	Continuing	Continuing
• JX0210: <i>Defense Biological Products Assurance Program (DBPAP)</i>	2.760	2.736	2.736	-	2.736	2.736	2.736	2.736	2.736	Continuing	Continuing
• PHM039: <i>Botulinum Monoclonal Antibodies (BOT MAB)</i>	-	-	-	-	-	-	33.601	-	-	Continuing	Continuing
• SA0043: <i>Next Gen Diag 2 Chemical Diagnostics (NGDS 2 CHEM DX)</i>	-	-	1.881	-	1.881	9.579	10.982	11.898	11.861	Continuing	Continuing
• SA0044: <i>Next Gen Diag 2 Man Portable Diagnostic System (NGDS 2 MPDS)</i>	0.336	-	-	-	-	7.949	7.291	4.752	2.290	Continuing	Continuing

Remarks

D. Acquisition Strategy
ANTI-VIRAL THERAPEUTICS (AV TX)

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Chemical and Biological Defense Program		Date: March 2023
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The Antiviral Therapeutics (AV TX) program acquisition strategy supports the development of therapeutics against Marburg virus bio-warfare threats. The overall regulatory approach of the program remains to pursue development for Food and Drug Administration (FDA) approval under the Animal Rule. The acquisition strategy is for the Marburg indication and will leverage collected safety data and large-scale manufacturing from the COVID efforts. This product was transitioned from Science and Technology (S&T).

BOTULINUM MONOCLONAL ANTIBODIES (BOT MAB)

The BOT MAB program was initiated by the Medical Countermeasure Platform Technologies (MCMPT). The regulatory approach of the program is to pursue development of products for U.S. Food & Drug Administration (FDA) approval. The program will conduct clinical and non-clinical studies to confirm duration of protection and on-set of protection. The performer will complete small model development and procure long lead items during the Technology Maturation and Risk Reduction (TMRR) phase in order to mitigate risk and accelerate the schedule activities for Biologics License Application (BLA) submission during the Product & Development (P&D) phase. The performer will continue large scale manufacturing during the Engineering and Manufacturing Development (EMD) phase in order to accelerate the schedule activities for the prophylactic indication.

CHEM BIO INCIDENT PREPAREDNESS AND RESPONSE - (CBIPR-ADM)

By establishing new capabilities at the DoD-ADM Facility and other strategic partners, the CBIPR-ADM line ensures that the DoD will have priority access to critical technologies and infrastructure that are operationally ready to support the rapid development and manufacture of Medical Countermeasures (MCMs). This approach ensures that the DoD's efforts are not limited to a single facility. In FY24, the CBIPR-ADM line will continue to establish, enhance, and optimize new manufacturing platform technologies and infrastructure to support the production of MCMs. These new manufacturing technologies can come from any government sources (including Joint Science & Technology Office for Chemical Biological Defense (JSTO-CBD), the Walter Reed Army Institute of Research (WRAIR), the Biomedical Advanced Research and Development Authority (BARDA), etc. when mature enough for BA4 funding) and/or other external sources and targets of opportunity from industry.

COUNTERING EMERGING THREATS RAPID ACQUISITION AND INVESTIGATION OF DRUGS FOR REPURPOSING (CET RAIDR)

The Countering Emerging Threats - Rapid Acquisition and Investigation of Drugs for Repurposing (CET RAIDR) program will leverage lessons learned from the COVID-19 response to conduct studies to evaluate U.S. Food & Drug Administration (FDA) approved and late-stage development products against CBRN threats. Data generated from these efforts will be used to support interim capabilities.

DEFENSE BIOLOGICAL PRODUCTS ASSURANCE PROGRAM (DBPAP)

DBPAP utilizes best buying principles and acquisition rigor for alignment to requirements to perform an "enabling" function for certain programs of record (e.g., Analytical Lab System (ALS), Common Analytical Lab System (CALs), Next Generation Diagnostic System (NGDS)) and other enterprise partners. The DBPAP uses better buying

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Chemical and Biological Defense Program	Date: March 2023
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Appropriation/Budget Activity	R-1 Program Element (Number/Name)	Project (Number/Name)
0400 / 5	PE 0604384BP / <i>Chemical and Biological Defense Program - EMD</i>	MB5 / <i>Medical Biological Defense (SDD)</i>

power to consolidate requirements for “commodity-like” biological detection products. The DBPAP coordinates closely with the Joint, Science and Technology Office to enhance the DBPAP reference material holdings in the Unified Culture Collection (UCC); improve antibodies and expand the portfolio of DBPAP immunoassays and reagents; and develop new molecular assays. The DBPAP uses a mix of competitive commercial contracts and funding of government laboratories to produce high quality assays and reagents.

NEXT GEN DIAG 2 CHEMICAL DIAGNOSTICS (NGDS 2 CHEMDX)

NGDS Increment 2 ChemDx is using an Other Transactions Authority (OTA) agreement to take advantage of nontraditional Defense contractor offerings, leveraging commercial technology to develop a capability for the diagnosis of nerve agent exposure in individuals. The OTA agreement holder is conducting system development, clinical trials and pre-developmental testing. ChemDx will use Department of Defense (DoD) test agencies to conduct Development Testing and operational user evaluations. Clinical trials will inform approval of the ChemDx system by the U.S. Food and Drug Administration for Prescription Home Use.

NEXT GEN DIAG 2 MAN PORTABLE DIAGNOSTIC SYSTEM (NGDS 2 MPDS)

NGDS 2 MPDS is currently in engineering and manufacturing development (EMD). MPDS is using Other Transactions Authority (OTA) agreements to take advantage of nontraditional Defense contractor offerings, leveraging commercial technology for Warfighter use. MPDS will use the agreement holder to conduct system development, clinical trials and pre-developmental testing (pre-DT) instrument testing. MPDS will also be using DoD clinical trial sites to support the agreement holder. MPDS will be using Department of Defense (DoD) agencies to conduct DT, operational assessment (OA), and Initial Operational Test & Evaluation (IOT&E). For the Production/Deployment Phase, the NGDS 2 MPDS will be using an existing COVID-established Indefinite Delivery/Indefinite Quantity (IDIQ) contract with the EMD performer to procure production systems, support, and assays.

SPECIAL IMMUNIZATION PROGRAM (VAC SIP)

The SIP program manages the continual storage, testing, compliance, and distribution activities associated with Investigational New Drugs (INDs) for legacy prophylactic medical countermeasures, as well as the recent Bot and Plague vaccine candidates. Additionally, the SIP maintains interagency agreements with US Army Medical Research and Development Command to support testing and compliance requirements. This Department of Defense program supports the Federal interagency with this effort, as well as academic and industry partners.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Chemical and Biological Defense Program												Date: March 2023			
Appropriation/Budget Activity 0400 / 5						R-1 Program Element (Number/Name) PE 0604384BP / Chemical and Biological Defense Program - EMD						Project (Number/Name) MB5 / Medical Biological Defense (SDD)			

Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
AV TX - Nonclinical Trials - OTA	C/FP	Gilead Sciences : San Francisco, CA	18.903	5.223	Nov 2021	0.000		0.000		-		0.000	0.000	24.126	0.000
AV TX - Product Development	Various	Various : N/A	-	2.175	Jun 2022	0.000		0.000		-		0.000	0.000	2.175	0.000
CBIPR-ADM - Infrastructure	C/CPFF	Ology Bioservices, Inc. : Alachua, FL	-	9.553	Mar 2022	0.000		0.000		-		0.000	0.000	9.553	0.000
CET RAIDR - Direct Product Support	Various	Various : N/A	-	1.927	Nov 2021	0.000		0.000		-		0.000	0.000	1.927	0.000
DBPAP - HW C - Development of Select Biological Threat Agent Reference Materials and Assays	MIPR	Various : N/A	6.761	1.698	Mar 2022	0.000		0.000		-		0.000	0.000	8.459	0.000
NGDS 2 CHEMDX - HW C - Product Management	Various	Various : N/A	-	1.485	Jan 2022	0.000		0.000		-		0.000	0.000	1.485	0.000
NGDS 2 CHEMDX - HW C - Product Development	C/CPFF	MRIGlobal : Kansas City, MO	1.849	2.860	Jan 2022	0.000		0.000		-		0.000	0.000	4.709	0.000
NGDS 2 MPDS - HW C - Product Management	Various	Various : N/A	2.505	2.627	Nov 2021	0.000		0.000		-		0.000	0.000	5.132	0.000
NGDS 2 MPDS - HW C - Man Portable Diagnostic System (MPDS)	C/CPFF	Cepheid : Sunnyvale, CA	21.112	10.942	Jan 2022	0.000		0.000		-		0.000	0.000	32.054	0.000
Subtotal			51.130	38.490		0.000		0.000		-		0.000	0.000	89.620	N/A

Support (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
AV TX - PM/MS - Sustainment	Various	US Army Medical Research Institute of Infectious Disease (USAMRIID) : Fort Detrick, MD	4.627	2.175	Dec 2022	0.000		0.000		-		0.000	0.000	6.802	0.000

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Chemical and Biological Defense Program												Date: March 2023			
Appropriation/Budget Activity 0400 / 5						R-1 Program Element (Number/Name) PE 0604384BP / Chemical and Biological Defense Program - EMD						Project (Number/Name) MB5 / Medical Biological Defense (SDD)			

Support (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
DBPAP - Select Biological Threat Agent Reference Material Support	MIPR	Various : N/A	6.807	1.732	Mar 2022	0.000		0.000		-		0.000	0.000	8.539	0.000
DBPAP - Select Biological Threat Agent Reference Material Regulatory/Quality Assurance (QA) Support	MIPR	U.S. Army Combat Capabilities Development Command (DEVCOM) Chemical Biological Center (CBC) : Aberdeen Proving Ground, MD	6.350	1.747	Mar 2022	0.000		0.000		-		0.000	0.000	8.097	0.000
NGDS 2 CHEMDX - ES C - Studies and Support	Various	Various : N/A	-	0.042	Mar 2022	0.000		0.000		-		0.000	0.000	0.042	0.000
NGDS 2 MPDS - ES C - Studies and Support	Various	Various : N/A	0.129	0.256	Jan 2022	0.000		0.000		-		0.000	0.000	0.385	0.000
Subtotal			17.913	5.952		0.000		0.000		-		0.000	0.000	23.865	N/A

Test and Evaluation (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
BOT MAB - DTE C - BOT MONO	C/CPFF	Resilience Government Services, Inc. : Alachua, Florida	14.437	50.799	Apr 2022	0.000		0.000		-		0.000	52.034	117.270	0.000
CET RAIDR - DTE C - Screening of Drugs for Repurposing	Various	Various : N/A	-	15.550	Dec 2021	0.000		0.000		-		0.000	0.000	15.550	0.000
NGDS 2 MPDS - OTHT S - Analytical/Clinical Testing	MIPR	US Army Medical Research and Development Command (USAMRDC) : Fort Detrick, MD	0.364	1.093	Feb 2022	0.000		0.000		-		0.000	0.000	1.457	0.000

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Chemical and Biological Defense Program **Date:** March 2023

Appropriation/Budget Activity 0400 / 5	R-1 Program Element (Number/Name) PE 0604384BP / Chemical and Biological Defense Program - EMD	Project (Number/Name) MB5 / Medical Biological Defense (SDD)
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Test and Evaluation (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
NGDS 2 MPDS - DTE S - System Test & Evaluation	MIPR	Various : N/A	1.454	0.067	Feb 2022	0.000		0.000		-		0.000	0.000	1.521	0.000
VAC SIP - OTHT C - Storage and Distribution of Vaccines	SS/FP	Fisher BioServices : Rockville, MD	3.154	0.593	Jan 2022	0.000		0.000		-		0.000	0.000	3.747	0.000
VAC SIP - OTHT C - Potency Testing of Vaccines	C/CPFF	Battelle Memorial Institute : Columbus, OH	1.112	4.210	Jan 2022	0.000		0.000		-		0.000	0.000	5.322	0.000
VAC SIP - OTHT C - Potency Testing of Vaccines	MIPR	US Army Medical Research Institute of Infectious Disease (USAMRIID) : Fort Detrick, MD	17.501	1.680	Jan 2022	0.000		0.000		-		0.000	0.000	19.181	0.000
Subtotal			38.022	73.992		0.000		0.000		-		0.000	52.034	164.048	N/A

Management Services (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
AV TX - PM/MS - SB - Program Management	Various	JPEO Chem, Bio, Rad, and Nuc Defense (JPEO-CBRND) : Aberdeen Proving Ground, MD	10.445	1.074	Dec 2021	0.000		0.000		-		0.000	0.000	11.519	0.000
AV TX - PM/MS - SB - Management Support (Biological Therapeutics)	Various	JPM CBRN Medical : Ft. Detrick, MD	3.287	3.505	Feb 2022	0.000		0.000		-		0.000	0.000	6.792	0.000
BOT MAB - Program Management Support	Various	JPM CBRN Medical, JPEO-CBRND : Fort Detrick, MD	4.338	4.060	Dec 2021	0.000		0.000		-		0.000	4.765	13.163	0.000
BOT MAB - CBRN Medical Support	Various	JPEO Chem, Bio, Rad, and Nuc Defense (JPEO-	1.700	4.505	Apr 2022	0.000		0.000		-		0.000	5.577	11.782	0.000

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Chemical and Biological Defense Program **Date:** March 2023

Appropriation/Budget Activity 0400 / 5	R-1 Program Element (Number/Name) PE 0604384BP / Chemical and Biological Defense Program - EMD	Project (Number/Name) MB5 / Medical Biological Defense (SDD)
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Management Services (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
		CBRND) : Aberdeen Proving Ground, MD													
CBIPR-ADM - Program Management Support	Various	JPL CBRND Enabling Biotechnologies, JPEO-CBRND : Fort Detrick, MD	-	0.578	Feb 2022	0.000		0.000		-		0.000	0.000	0.578	0.000
CET RAIDR - PM/MS SB - Indirect Management Support	Various	Various : N/A	-	1.731	Nov 2021	0.000		0.000		-		0.000	0.000	1.731	0.000
DBPAP - PM/MS C - Product Management Contractor Support	SS/FFP	Various : N/A	3.907	0.975	Feb 2022	0.000		0.000		-		0.000	0.000	4.882	0.000
DBPAP - PM/MS C - Product Management Support	Various	Various : N/A	7.776	1.436	Jan 2022	0.000		0.000		-		0.000	0.000	9.212	0.000
NGDS 2 CHEMDX - PM/MS S - Management Services	Various	Various : N/A	0.167	0.432	Nov 2021	0.000		0.000		-		0.000	0.000	0.599	0.000
NGDS 2 MPDS - PM/MS S - Management Services	Various	Various : N/A	5.040	1.426	Nov 2021	0.000		0.000		-		0.000	0.000	6.466	0.000
Subtotal			36.660	19.722		0.000		0.000		-		0.000	10.342	66.724	N/A

	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract	
Project Cost Totals		143.725	138.156	0.000	0.000	-	0.000	62.376	344.257	N/A

Remarks

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Exhibit R-4, RDT&E Schedule Profile: PB 2024 Chemical and Biological Defense Program **Date:** March 2023

Appropriation/Budget Activity 0400 / 5	R-1 Program Element (Number/Name) PE 0604384BP / <i>Chemical and Biological Defense Program - EMD</i>	Project (Number/Name) MB5 / <i>Medical Biological Defense (SDD)</i>
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	FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027				FY 2028			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
AV TX - sNDA (Marburg)																												
AV TX - Natural History Study (Marburg)																												
AV TX - Animal Efficacy Studies (Marburg)																												
BOT MAB - Platform Development																												
BOT MAB - Clinical and Nonclinical																												
BOT MAB - Manufacturing																												
BOT MAB - MS B-Milestone B																												
BOT MAB - MS C-Milestone C																												
BOT MAB - Biologics License Application (BLA) Submission																												
CBIPR-ADM - MCM Enabling Manufacturing Technologies																												
CBIPR-ADM - MCM Development and Manufacturing Support (Infrastructure)																												
CET RAIDR - Advance Development Efforts to Repurpose FDA Approved Products																												
DBPAP - Acquire and Distribute Quality Select Biological Reference Materials and Assays while Storing and Analyzing Related Data																												
NGDS 2 CHEMDX - MS B-Milestone B																												
NGDS 2 CHEMDX - EMD																												
NGDS 2 CHEMDX - MS C-Milestone C																												
NGDS 2 MPDS - EMD																												
NGDS 2 MPDS - MS C-Milestone C - LRIP																												
NGDS 2 MPDS - FRP-Full Rate Production Decision																												

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Exhibit R-4, RDT&E Schedule Profile: PB 2024 Chemical and Biological Defense Program **Date:** March 2023

Appropriation/Budget Activity 0400 / 5	R-1 Program Element (Number/Name) PE 0604384BP / <i>Chemical and Biological Defense Program - EMD</i>	Project (Number/Name) MB5 / <i>Medical Biological Defense (SDD)</i>
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	FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027				FY 2028			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
VAC SIP - Storage, distribution, potency testing, biosurety compliance activities																												

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Chemical and Biological Defense Program		Date: March 2023
Appropriation/Budget Activity 0400 / 5	R-1 Program Element (Number/Name) PE 0604384BP / <i>Chemical and Biological Defense Program - EMD</i>	Project (Number/Name) MB5 / <i>Medical Biological Defense (SDD)</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
AV TX - sNDA (Marburg)	4	2023	2	2024
AV TX - Natural History Study (Marburg)	1	2022	1	2023
AV TX - Animal Efficacy Studies (Marburg)	1	2022	4	2023
BOT MAB - Platform Development	1	2022	4	2025
BOT MAB - Clinical and Nonclinical	1	2022	3	2025
BOT MAB - Manufacturing	1	2022	4	2025
BOT MAB - MS B-Milestone B	2	2022	2	2022
BOT MAB - MS C-Milestone C	2	2023	2	2023
BOT MAB - Biologics License Application (BLA) Submission	4	2025	4	2025
CBIPR-ADM - MCM Enabling Manufacturing Technologies	1	2022	4	2028
CBIPR-ADM - MCM Development and Manufacturing Support (Infrastructure)	1	2022	4	2028
CET RAIDR - Advance Development Efforts to Repurpose FDA Approved Products	1	2023	4	2028
DBPAP - Acquire and Distribute Quality Select Biological Reference Materials and Assays while Storing and Analyzing Related Data	1	2022	4	2028
NGDS 2 CHEMDX - MS B-Milestone B	1	2022	1	2022
NGDS 2 CHEMDX - EMD	1	2023	2	2025
NGDS 2 CHEMDX - MS C-Milestone C	2	2025	2	2025
NGDS 2 MPDS - EMD	1	2022	1	2026
NGDS 2 MPDS - MS C-Milestone C - LRIP	2	2025	2	2025
NGDS 2 MPDS - FRP-Full Rate Production Decision	2	2026	2	2026
VAC SIP - Storage, distribution, potency testing, biosurety compliance activities	1	2022	4	2023

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Chemical and Biological Defense Program										Date: March 2023		
Appropriation/Budget Activity 0400 / 5					R-1 Program Element (Number/Name) PE 0604384BP / <i>Chemical and Biological Defense Program - EMD</i>				Project (Number/Name) MC5 / <i>Medical Chemical Defense (SDD)</i>			
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
MC5: <i>Medical Chemical Defense (SDD)</i>	-	38.936	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	38.936
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This project supports efforts in the Engineering and Manufacturing Development (EMD) phase of the acquisition strategy for prophylactic, pre-treatment, and therapeutic drugs and diagnostic medical devices for the protection, treatment, detection, and medical management of chemical warfare agent exposures. This project provides for the research and development of safety studies, manufacturing scale-up, process validation, drug interaction, performance test, and submission of the Food and Drug Administration (FDA) drug licensure application(s). In FY2023, the CBDP RDT&E Projects have been restructured to align to the CBDP portfolio. MC5 efforts in FY2022 progress to the Mitigate (MT5) portfolio. This restructuring is intended to provide standardization and alignment across CBDP research, development and acquisition efforts.

Efforts included in this Project are:

- (1) Advanced Anticonvulsant System (AAS),
- (2) Alternative Autoinjector Manufacturer Capability (AUTOINJ) ****Progresses to MT5 in FY2023****,
- (3) Improved Nerve Agent Treatment System Centrally Acting (INATS CA) ****Progresses to MT5 in FY2023****, and
- (4) Rapid Opioid Countermeasure System (ROCS)

The AAS program provides for midazolam in an autoinjector for treatment of nerve agent induced seizures. Midazolam, injected intramuscularly, will treat traditional nerve agent and non-traditional agent-induced seizures and prevent subsequent neurological damage. Midazolam is more water-soluble than diazepam (the currently fielded medication to control nerve agent-induced seizures) and terminates nerve agent-induced seizures more quickly than diazepam. AAS will not eliminate the need for other protective and therapeutic systems. FY22 is the last year of RDT&E funding and completes a Phase 1 clinical study from a new manufacturer and submits a New Drug Application (NDA).

The INATS CA program provides a centrally-acting anticholinergic agent to increase survivability and decrease morbidity after exposure to toxic nerve agent threats. Scopolamine was selected for development after an extensive analysis of alternatives and review of data by the Science and Technology community. Added to the currently fielded system, the INATS CA program will improve overall medical outcomes and will be utilized as both a vial for use at definitive care and a stand-alone auto-injector for use in the field. INATS CA continues autoinjector development and manufacturing activities of the drug product and autoinjector device, as well as continues non-clinical animal studies.

The ROCS program supports the discovery, characterization, development, and fielding of FDA-approved therapeutic Medical Countermeasures (MCMs) to protect the Joint Service warfighter against operational exposures to the opioid class of pharmaceutical-based agents (PBAs), a high priority. The ROCS program will

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Chemical and Biological Defense Program **Date:** March 2023

Appropriation/Budget Activity 0400 / 5	R-1 Program Element (Number/Name) PE 0604384BP / <i>Chemical and Biological Defense Program - EMD</i>	Project (Number/Name) MC5 / <i>Medical Chemical Defense (SDD)</i>
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develop a naloxone autoinjector as a rescue treatment that will counteract the adverse effects from exposure to opioids. The ROCS will be developed using a Middle Tier Acquisition (MTA) approach. FY22 is the last year of RDT&E funding and completes manufacturing activities, including manufacturing of the drug product and autoinjector device, and completes regulatory activities such as preparation and submission of the New Drug Application (NDA) for approval.

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2022	FY 2023	FY 2024
Title: 1) AAS - NDA Submission Description: New Drug Application (NDA) Submission Activities	3.157	-	-
Title: 2) AUTOINJ - Manufacturing Description: Manufacturing	3.000	-	-
Title: 3) AUTOINJ - Prototyping and Testing Description: Prototyping and Testing	1.000	-	-
Title: 4) AUTOINJ - Development Description: Development	2.000	-	-
Title: 5) AUTOINJ - Government Testing Description: Government Testing	0.188	-	-
Title: 6) AUTOINJ - FDA Coordination Description: FDA Coordination	1.093	-	-
Title: 7) AUTOINJ - Reconstituted Drug Autoinjector Description: Reconstituted Drug Autoinjector Development for Improved Stability	6.577	-	-
Title: 8) INATS CA - Clinical Description: Clinical	0.400	-	-
Title: 9) INATS CA - Manufacturing Description: Manufacture drug product and device development	4.237	-	-
Title: 10) INATS CA - Non-Clinical	8.659	-	-

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Chemical and Biological Defense Program		Date: March 2023
Appropriation/Budget Activity 0400 / 5	R-1 Program Element (Number/Name) PE 0604384BP / <i>Chemical and Biological Defense Program - EMD</i>	Project (Number/Name) MC5 / <i>Medical Chemical Defense (SDD)</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2022	FY 2023	FY 2024
Description: Non-Clinical Testing to support FDA approval			
Title: 11) ROCS - Manufacturing	7.471	-	-
Description: Manufacturing			
Title: 12) ROCS - Regulatory	1.154	-	-
Description: FDA & Regulatory activities			
Accomplishments/Planned Programs Subtotals	38.936	-	-

C. Other Program Funding Summary (\$ in Millions)

Line Item	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
• MC7: <i>Medical Chemical Defense (Op Sys Dev)</i>	1.013	-	-	-	-	-	-	-	-	0.000	1.013
• MT5: <i>Mitigate (SDD)</i>	-	74.225	88.441	-	88.441	92.279	91.431	87.773	93.250	Continuing	Continuing
• MT7: <i>Mitigate (Op Sys Dev)</i>	-	5.098	3.074	-	3.074	1.987	1.819	1.845	1.862	Continuing	Continuing
• JM6677: <i>Advanced Anticonvulsant System (AAS)</i>	4.243	18.147	24.101	-	24.101	15.301	-	-	-	Continuing	Continuing
• PHM015: <i>Rapid Opioid Countermeasure System (ROCS)</i>	4.349	-	-	-	-	-	-	-	-	0.000	4.349
• PHM040: <i>Improved Nerve Agent Treatment Centrally Acting (INATS CA)</i>	-	-	-	-	-	-	-	6.511	33.883	Continuing	Continuing

Remarks

D. Acquisition Strategy

ADVANCED ANTICONVULSANT SYSTEM (AAS)

The Advanced Anticonvulsant System (AAS), consists of Midazolam in an autoinjector for treatment of seizures, to include those caused by nerve agent. A contractor shall be responsible for conducting activities associated with drug development in a manner consistent with eventual approval by the Food and Drug Administration (FDA). The contractor shall sponsor the drug to the FDA and hold all approvals and/or licenses. The Contractor will need to initiate and complete studies that comply with new FDA requirements for manufacturing and quality for autoinjector products, ultimately leading to FDA approval. Upon FDA approval, sufficient quantities of

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Chemical and Biological Defense Program		Date: March 2023
Appropriation/Budget Activity 0400 / 5	R-1 Program Element (Number/Name) PE 0604384BP / <i>Chemical and Biological Defense Program - EMD</i>	Project (Number/Name) MC5 / <i>Medical Chemical Defense (SDD)</i>

product to meet Initial Operational Capability (IOC) and Full Operational Capability (FOC) will be purchased through a follow-on sole source procurement contract. Subsequent purchases for product sustainment will be made by the Defense Logistics Agency. Post marketing commitments and requirements are anticipated as a result of the FDA approval and will be the responsibility of the contractor and the government.

ALTERNATE AUTOINJECTOR MANUFACTURER CAPABILITY (AUTOINJ)

The AUTOINJ will identify an alternative source(s) to develop and provide required Food and Drug Administration (FDA) approved autoinjector-delivered nerve agent antidote and treatment capabilities to the Department of Defense (DoD). The AUTOINJ effort leverages novel technologies and industrial base expansion in order to develop the autoinjector products. AUTOINJ uses contracts and Other Transactional Agreements (OTAs) in which the performer shall be responsible for conducting development and testing activities consistent with current FDA regulations. The contractor shall sponsor the combination product to the FDA and hold all approvals and/or licenses. Upon FDA approval, purchases for product sustainment will be made by the Defense Logistics Agency.

IMPROVED NERVE AGENT TREATMENT CENTRALLY ACTING (INATS CA)

In the Engineering and Manufacturing Development (EMD) phase, the Government will engage with commercial partner(s) to ensure that development and manufacture is in accordance with Food and Drug Administration (FDA) regulations. For scopolamine autoinjector development INATS CA uses contracts and Other Transactional Agreements (OTAs) in which the performer shall be responsible for conducting development and testing activities consistent with current FDA regulations. The contractor shall sponsor the combination product to the FDA and hold all approvals and/or licenses. Upon FDA approval, a follow-on procurement agreement will be used to procure initial operational capability (IOC) / full operational capability (FOC).

RAPID OPIOID COUNTERMEASURE SYSTEM (ROCS)

The ROCS program is a Joint Acquisition Category (ACAT) III Medical Countermeasure (MCM) Middle Tier Acquisition Program of Record (POR). ROCS utilized existing naloxone autoinjector capabilities identified from focused Market Research and developed an FDA approved product under Other Transaction Authority (OTA) agreement. The program is currently in the procurement phase and will transition to the Primary Pharmaceutical Vendor (PPV) program.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Chemical and Biological Defense Program **Date:** March 2023

Appropriation/Budget Activity 0400 / 5	R-1 Program Element (Number/Name) PE 0604384BP / Chemical and Biological Defense Program - EMD	Project (Number/Name) MC5 / Medical Chemical Defense (SDD)
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Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
AAS - NDA Submission Activities	C/CPFF	RAFA Laboratories : N/A	3.345	2.221	Dec 2021	0.000		0.000		-		0.000	0.000	5.566	0.000
AAS - Product Management	C/CPFF	JPM CBRN Medical, JPEO-CBRND : Fort Detrick, MD	0.944	0.362	Nov 2021	0.000		0.000		-		0.000	0.000	1.306	0.000
AUTOINJ - Program Management	C/FFP	JPM CBRN Medical, JPEO-CBRND : Fort Detrick, MD	3.060	1.737	Nov 2021	0.000		0.000		-		0.000	0.000	4.797	0.000
AUTOINJ - HW C - Diazepam Autoinjector	C/CPFF	Emergent Biosolutions : Gaithersburg/ Rockville, MD	18.045	3.725	Nov 2021	0.000		0.000		-		0.000	0.000	21.770	0.000
AUTOINJ - HW C - Dual Drug Delivery Device (D4) Prototype	C/CPFF	Emergent Biosolutions : Gaithersburg/ Rockville, MD	1.785	0.300	Dec 2021	0.000		0.000		-		0.000	0.000	2.085	0.000
AUTOINJ - HW C - RAD-A	C/CPFF	Various : N/A	-	6.577	Nov 2022	0.000		0.000		-		0.000	0.000	6.577	0.000
INATS CA - Product Management	C/CPFF	JPM CBRN Medical, JPEO-CBRND : Fort Detrick, MD	2.602	1.674	Mar 2022	0.000		0.000		-		0.000	0.000	4.276	0.000
INATS CA - HW C - Clinical	C/CPFF	Battelle Memorial Institute : Columbus, OH	3.198	0.400	Apr 2022	0.000		0.000		-		0.000	0.000	3.598	0.000
INATS CA - HW C - Manufacturing	C/FFP	Aktivax : Boulder, CO	4.716	4.237	Dec 2021	0.000		0.000		-		0.000	0.000	8.953	0.000
INATS CA - HW C - Non-Clinical	C/CPFF	Battelle Memorial Institute : Columbus, OH	9.397	2.132	Nov 2021	0.000		0.000		-		0.000	0.000	11.529	0.000
ROCS - Product Management	Various	JPM CBRN Medical, JPEO-CBRND : Fort Detrick, MD	0.711	0.357	Feb 2022	0.000		0.000		-		0.000	0.000	1.068	0.000
ROCS - HW C - Manufacturing	C/CPFF	kaleo : Richmond, VA	8.026	4.798	Nov 2021	0.000		0.000		-		0.000	0.000	12.824	0.000

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Chemical and Biological Defense Program **Date:** March 2023

Appropriation/Budget Activity 0400 / 5	R-1 Program Element (Number/Name) PE 0604384BP / Chemical and Biological Defense Program - EMD	Project (Number/Name) MC5 / Medical Chemical Defense (SDD)
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Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
ROCS - HW C - Regulatory	C/CPFF	kaleo : Richmond, VA	-	1.154	Oct 2021	0.000		0.000		-		0.000	0.000	1.154	0.000
Subtotal			55.829	29.674		0.000		0.000		-		0.000	0.000	85.503	N/A

Support (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Subtotal			-	-		-		-		-		-	-	-	N/A

Management Services (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
AAS - Management Services	Various	JPEO Chem, Bio, Rad, and Nuc Defense (JPEO-CBRND) : Aberdeen Proving Ground, MD	0.389	0.574	Dec 2021	0.000		0.000		-		0.000	0.000	0.963	0.000
AUTOINJ - Management Services	Various	JPEO Chem, Bio, Rad, and Nuc Defense (JPEO-CBRND) : Aberdeen Proving Ground, MD	6.766	1.519	Dec 2021	0.000		0.000		-		0.000	0.000	8.285	0.000
INATS CA - Management Services	Various	JPM CBRN Medical, JPEO-CBRND : Fort Detrick, MD	4.322	1.061	Dec 2021	0.000		0.000		-		0.000	0.000	5.383	0.000
INATS CA - Management Services	Various	JPEO Chem, Bio, Rad, and Nuc Defense (JPEO-CBRND) : Aberdeen Proving Ground, MD	-	3.792	Dec 2021	0.000		0.000		-		0.000	0.000	3.792	0.000

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Chemical and Biological Defense Program		Date: March 2023
Appropriation/Budget Activity 0400 / 5	R-1 Program Element (Number/Name) PE 0604384BP / <i>Chemical and Biological Defense Program - EMD</i>	Project (Number/Name) MC5 / <i>Medical Chemical Defense (SDD)</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
AAS - NDA Submission-New Drug Application Submission	1	2022	3	2022
AAS - FDA Approval-Food and Drug Administration Approval	4	2022	4	2022
AAS - RFP-Development Request for Proposal Release Decision	1	2024	1	2024
AAS - IOC-Initial Operational Capability	4	2023	4	2023
AAS - FOC-Full Operational Capability	4	2025	4	2025
AUTOINJ - Development	1	2022	4	2023
AUTOINJ - Manufacturing	1	2022	4	2023
AUTOINJ - Prototyping and Testing	1	2022	2	2023
AUTOINJ - Dual Drug Delivery Device (D4)	1	2022	1	2025
AUTOINJ - Government Testing	1	2022	2	2022
AUTOINJ - RAD - A	2	2023	4	2027
INATS CA - MS B-Milestone B	2	2022	2	2022
INATS CA - Clinical Trials	1	2022	4	2024
INATS CA - Manufacturing/Auto-Injector	1	2022	2	2025
INATS CA - Non-Clinical Studies	1	2022	2	2025
INATS CA - NDA Submission-New Drug Application Submission	1	2026	3	2026
INATS CA - FDA Approval-Food and Drug Administration Approval	3	2026	1	2028
INATS CA - SNAPP Modernization - BA7	1	2022	4	2025
INATS CA - PB Extended Release Tablet Development - BA7	1	2023	1	2026
ROCS - Manufacturing Activities	1	2022	4	2022
ROCS - FDA Approval-Food and Drug Administration Approval - FDA Approval & PMRs	1	2022	4	2022

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Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Chemical and Biological Defense Program **Date:** March 2023

Appropriation/Budget Activity 0400: <i>Research, Development, Test & Evaluation, Defense-Wide / BA 6: RDT&E Management Support</i>	R-1 Program Element (Number/Name) PE 0605384BP / <i>Chemical and Biological Defense Program</i>
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COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
Total Program Element	0.000	116.573	126.432	74.382	0.000	74.382	73.757	75.320	75.378	73.142	Continuing	Continuing
DW6: <i>Major Range And Test Facility Base (Mgmt Support)</i>	-	63.914	63.390	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	127.304
LS6: <i>Laboratory Support (Mgmt Support)</i>	-	8.659	10.187	10.290	0.000	10.290	10.290	10.290	10.290	10.290	Continuing	Continuing
MS6: <i>Management Support (Mgmt Support)</i>	-	41.950	52.855	64.092	0.000	64.092	63.467	65.030	65.088	62.852	Continuing	Continuing
DT6: <i>Joint Doctrine And Training Support (Mgmt Support)</i>	-	0.836	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.836
O49: <i>Joint Concept Development (Mgmt Support)</i>	-	1.214	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.214

A. Mission Description and Budget Item Justification

This program element (PE) resources to research, development, test, and evaluation (RDT&E) management support as a key enabler across the Understand, Protect, Mitigate, and Enabling Investments portfolios. Chemical Biological Defense Program (CBDP) investments provide an integrated, layered capability to enable combating weapons of mass destruction (CWMD) missions ranging from combat operations to Department of Defense (DoD) support to domestic incident prevention and response. The Projects in this PE support sustainment and modernization of laboratory infrastructure, test capabilities, studies and analyses, Joint doctrine and training, and program and financial management support. FY24 funding accelerates characterization and situational awareness of emerging biothreats and accelerates delivery of improved protection from and mitigation of biothreats, including rapid repurposing of available therapeutics and development of new vaccines.

Individual Projects include:

- Major Range and Test Facility Base (MRTFB) (DW6): Operating support to West Desert Test Center (WDTC) and BioTesting Division (Chemical Biological Center) for the required institutional test operating costs (e.g., institutional civilian and contractor labor; repair and maintenance of test instrumentation, equipment, and facilities; and replacement of test equipment). Beginning in FY24, Project DW6 will functionally transfer program and funding to the 2040 appropriation, PE 0605601A / Project WD1, West Desert Test Center.

- Laboratory Support (LS6): Operating support for sustainment and modernization efforts for surety laboratory infrastructure in order to maintain and enhance DoD infrastructure capabilities to counter an expanding threat space, exploit advances in technology, and develop and transition CB defense equipment and countermeasures to the Warfighter.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Chemical and Biological Defense Program **Date:** March 2023

Appropriation/Budget Activity 0400: <i>Research, Development, Test & Evaluation, Defense-Wide I BA 6: RDT&E Management Support</i>	R-1 Program Element (Number/Name) PE 0605384BP / <i>Chemical and Biological Defense Program</i>
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- Management Support (MS6): Management support for the DoD CBDP to allow program overview and integration of overall medical and non-medical programs by the Assistant Secretary of Defense for Nuclear, Chemical, and Biological Defense Programs (ASD(NCB)), through the Deputy Assistant Secretary of Defense for Chemical Biological Defense (DASD(CBD)).

- Joint Doctrine and Training Support (DT6) and Joint Concept Development (O49) are no longer active FY24 Projects due to budget restructuring.

B. Program Change Summary (\$ in Millions)	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Previous President's Budget	115.503	124.475	125.966	-	125.966
Current President's Budget	116.573	126.432	74.382	-	74.382
Total Adjustments	1.070	1.957	-51.584	-	-51.584
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-2.243			
• Congressional Rescissions	-	-			
• Congressional Adds	-	4.200			
• Congressional Directed Transfers	-	-			
• Reprogrammings	6.362	-			
• SBIR/STTR Transfer	-2.923	-			
• Other Adjustments	-2.369	-	-51.584	-	-51.584

Congressional Add Details (\$ in Millions, and Includes General Reductions)

Project: DW6: *Major Range And Test Facility Base (Mgmt Support)*

Congressional Add: *Chemical/Biological Defense Testing*

Congressional Add Subtotals for Project: DW6

Congressional Add Totals for all Projects

	FY 2022	FY 2023
	5.000	4.200
	5.000	4.200
	5.000	4.200

Change Summary Explanation

Funding: FY 2022 (+\$5.000 Million): Congressional Add for chemical/biological defense testing is reflected in the Previous President's Budget total.

FY 2022 (+\$6.362 Million): Below threshold reprogramming increase from prior year execution balances to support transfer of funding to Nuclear, Chemical, and Biological (NCB) high priority efforts and the Departments higher priorities.

FY 2022 (-\$2.923 Million): Transfer of funding to support Small Business Innovative Research/Small Business Technology Transfer efforts.

FY 2022 (-\$2.369 Million): CBDP funding transferred to Nuclear, Chemical, and Biological (NCB) high priority efforts.

FY 2023 (-\$2.243 Million): Congressional Directed Reductions.

FY 2023 (+\$4.200 Million): Congressional Add for major range and test facility base management support.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Chemical and Biological Defense Program		Date: March 2023
Appropriation/Budget Activity 0400: <i>Research, Development, Test & Evaluation, Defense-Wide / BA 6:</i> <i>RDT&E Management Support</i>	R-1 Program Element (Number/Name) PE 0605384BP / <i>Chemical and Biological Defense Program</i>	

FY 2024 (-\$51.584 Million): Decrease due Project DW6 functional transfer of program and funding to the 2040 appropriation, PE 0605601A / Project WD1, West Desert Test Center (-\$63.028 Million); and additional adjustments to increase situational awareness of biodefense materiel readiness (+\$5.200 Million), Departmental inflation rate adjustments (+\$1.687 Million), and routine program adjustments to balance overall portfolio efforts (+\$4.557 Million).

Schedule: N/A

Technical: N/A

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Chemical and Biological Defense Program										Date: March 2023		
Appropriation/Budget Activity 0400 / 6					R-1 Program Element (Number/Name) PE 0605384BP / <i>Chemical and Biological Defense Program</i>				Project (Number/Name) DW6 / <i>Major Range And Test Facility Base (Mgmt Support)</i>			
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
DW6: <i>Major Range And Test Facility Base (Mgmt Support)</i>	-	63.914	63.390	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	127.304
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Major Range and Test Facility Base (MRTFB) Research, Development, Test, and Evaluation (RDT&E) Management Support Project provides for the Dugway Proving Ground (DPG) MRTFB technical and operational capability for proving Department of Defense (DoD) Chemical and Biological (CB) and Non Traditional Agent (NTA) defense materiel, equipment, and systems from concept through production to include associated special operations Tactics, Techniques, and Procedures Development (TTPD) activities.

Efforts included in this Project are:

- (1) Combat Capability Development Command (DEVCOM) Chemical and Biological Center BioTesting Division (BTD-CBC)
- (2) West Desert Test Center (WDTC)

Together WDTC and BTD-CBC are the reliance centers for all DoD CB defense testing and provide the United States' only combined range, chamber, toxic chemical lab, and bio-safety level 3 Biological Select Agent and Toxin (BSAT) aerosol test capability. WDTC and BTD-CBC use unique, state-of-the-art chemical and life-science test facilities and test chambers to perform CB defense testing of protective gear, decontamination systems, detectors, equipment, and non-materiel CB defense solutions while maintaining safety, security, and surety of chemical agents and biological pathogens. WDTC also provides surveyed and instrumented outdoor ranges and specialized structures for CB simulant agent dissemination in operationally threat-relevant environments and TTPD activities.

Beginning in FY24, the PE 0605384BP / Project DW6, MRTFB RDT&E Management Support will functionally transfer program and funding from appropriation 0400, to the 2040 appropriation, PE 0605601A / Project WD1, West Desert Test Center.

B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2022	FY 2023	FY 2024
Title: 1) BTB TEST - MRTFB	7.609	7.641	-
Description: Funding maintains MRTFB test and evaluation (T&E) mission readiness at Bio Testing Division for biological surety laboratory operations, bio-safety risk management, and defensive T&E mission support activities. Lothar Salomon Life Sciences Test Facility (LSTF) and Baker complex contains biosafety level (BSL) 1, 2, and 3 laboratories for testing biological weapons detectors, individual protective clothing and equipment, decontamination systems, and material survivability in a bioweapon contaminated environment. LSTF is the sole DoD facility certified to challenge developmental defensive test equipment with			

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Chemical and Biological Defense Program		Date: March 2023
Appropriation/Budget Activity 0400 / 6	R-1 Program Element (Number/Name) PE 0605384BP / <i>Chemical and Biological Defense Program</i>	Project (Number/Name) DW6 / <i>Major Range And Test Facility Base (Mgmt Support)</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2022	FY 2023	FY 2024
<p>aerosolized biological warfare agents, including bacteria, viruses, and biological toxins, in BSL-3 chambers. Represents the MRTFB activity's institutional and overhead T&E mission support activities not financed by DoD MRTB users.</p> <p>FY 2023 Plans: Continue T&E mission support activities (civilian labor, travel, training, communications, printing and reproduction, supplies, equipment acquisition, contract support, and purchased equipment maintenance) not chargeable to a test customer to maintain mission readiness of biological developmental and operational T&E capability.</p> <p>FY 2023 to FY 2024 Increase/Decrease Statement: Program/project funding transferred to another funding line. In FY24, PE 0605384BP / Project DW6, MRTFB RDT&E Management Support will realign from appropriation 0400 to the 2040 appropriation, PE 0605601A / Project WD1, West Desert Test Center.</p>			
<p>Title: 2) DPG - WDTC, MRTFB Civilian Pay</p> <p>Description: MRTFB Civilian Pay</p> <p>FY 2023 Plans: Funds will continue to support the overhead costs of civilian labor, with the balance customer funded. Test customers will continue to pay all costs directly attributable to the use of a test facility or resource for testing of a particular program. West Desert Test Center (WDTC) will continue to provide a specially trained support staff to operate and maintain all critical testing systems.</p> <p>FY 2023 to FY 2024 Increase/Decrease Statement: Program/project funding transferred to another funding line. In FY24, PE 0605384BP / Project DW6, MRTFB RDT&E Management Support will realign from appropriation 0400 to the 2040 appropriation, PE 0605601A / Project WD1, West Desert Test Center.</p>	26.882	27.715	-
<p>Title: 3) DPG - WDTC, MRTFB Mission Support</p> <p>Description: MRTFB Mission Support - Provides ongoing sustainment of existing chemical test instrumentation and equipment at WDTC necessary for chemical laboratories, chemical/biological field and simulant chamber, data science test mission readiness, and staff functions not chargeable to a test customer. Supports annual service contracts for test equipment operations, diagnostics, calibration, and certification, as well as routine life-cycle and use-related replacement of existing field, test related administrative, and analytical instrumentation components and systems. Supports test facility maintenance, handling and disposal of hazardous materials, transportation, postage, administrative supplies, tools, software, spare parts, mission unique installation costs, temporary duty/training of civilian and contractor personnel, personnel certifications, printing, reproduction, and communications.</p> <p>FY 2023 Plans:</p>	12.431	12.588	-

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Chemical and Biological Defense Program **Date:** March 2023

Appropriation/Budget Activity 0400 / 6	R-1 Program Element (Number/Name) PE 0605384BP / <i>Chemical and Biological Defense Program</i>	Project (Number/Name) DW6 / <i>Major Range And Test Facility Base (Mgmt Support)</i>
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B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2022	FY 2023	FY 2024
<p>Funds will provide continued sustainment of existing test instrumentation and equipment at WDTC in support of operations; support annual service contracts for equipment operation, diagnostics, and calibration, as well as routine life-cycle and use-related replacement of existing field, administrative, and analytical instrumentation components and systems; support test facility maintenance, handling and disposal of hazardous materials, transportation, postage, administrative supplies, tools, software, spare parts, mission unique installation costs, temporary duty/training of civilian and contractor personnel, certifications, printing and reproduction, and communications.</p> <p>FY 2023 to FY 2024 Increase/Decrease Statement: Program/project funding transferred to another funding line. In FY24, PE 0605384BP / Project DW6, MRTFB RDT&E Management Support will realign from appropriation 0400 to the 2040 appropriation, PE 0605601A / Project WD1, West Desert Test Center.</p>			
<p>Title: 4) DPG - WDTC, MRTFB Contractor Support</p> <p>Description: MRTFB Contractor Support</p> <p>FY 2023 Plans: Funds will continue to support contractor labor costs not billable to customers. Contract labor augments core civilian T&E personnel with additional expertise, capabilities, and/or capacity. Functions include chemical and biological analysis, test field support, planning and test report documentation; range operations, warehousing, project management, maintenance to test facilities and data acquisition. For some skillsets, no government civilians perform the work.</p> <p>FY 2023 to FY 2024 Increase/Decrease Statement: Program/project funding transferred to another funding line. In FY24, PE 0605384BP / Project DW6, MRTFB RDT&E Management Support will realign from appropriation 0400 to the 2040 appropriation, PE 0605601A / Project WD1, West Desert Test Center.</p>	11.992	11.246	-
Accomplishments/Planned Programs Subtotals	58.914	59.190	-

	FY 2022	FY 2023
<p>Congressional Add: Chemical/Biological Defense Testing</p> <p>FY 2022 Accomplishments: Continued testing upgrades and modernization to support chemical/biological defense testing at West Desert Test Center and DEVCOM CBC BioTesting Division.</p> <p>FY 2023 Plans: Fund Major Range and Test Facility Base management support operations.</p>	5.000	4.200
Congressional Adds Subtotals	5.000	4.200

C. Other Program Funding Summary (\$ in Millions)
N/A

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Chemical and Biological Defense Program		Date: March 2023
Appropriation/Budget Activity 0400 / 6	R-1 Program Element (Number/Name) PE 0605384BP / <i>Chemical and Biological Defense Program</i>	Project (Number/Name) DW6 / <i>Major Range And Test Facility Base (Mgmt Support)</i>

C. Other Program Funding Summary (\$ in Millions)

Remarks

D. Acquisition Strategy

N/A

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Chemical and Biological Defense Program										Date: March 2023		
Appropriation/Budget Activity 0400 / 6					R-1 Program Element (Number/Name) PE 0605384BP / <i>Chemical and Biological Defense Program</i>				Project (Number/Name) LS6 / <i>Laboratory Support (Mgmt Support)</i>			
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
LS6: <i>Laboratory Support (Mgmt Support)</i>	-	8.659	10.187	10.290	0.000	10.290	10.290	10.290	10.290	10.290	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Laboratory Support Research, Development, Test, and Evaluation (RDT&E) Management Support Project provides Department of Defense (DoD) laboratory infrastructure sustainment and modernization to upgrade key systems to current state-of-the-art capabilities. Ensures that the necessary surety operations can be conducted effectively and safely in support of the Chemical and Biological Defense Program (CBDP). As a force multiplier, this Project will provide more robust capabilities to the CBDP and ensure continuity of operations and environmental compliance.

Efforts included in this Project are:

- (1) U.S. Army Combat Capabilities Development Command (DEVCOM) Chemical Biological Center (CBC) Laboratory Infrastructure, and
- (2) U.S. Army Medical Research and Development Command (MRDC) Laboratory Infrastructure

DEVCOM Chemical Biological Center (CBC) laboratory infrastructure provides sustainment and modernization to research and develop CB defense capabilities that enable the Joint Force to fight and win in contested environments. CBC explores, assesses, and demonstrates operational utility of Integrated Early Warning and Integrated Layered Defense approaches that impact the Warfighter's ability to manage operational decisions while playing a critical role in modernizing the Army and DoD's Biodefense capabilities. CBC assesses and characterizes emerging threats in order to prevent use and avoid surprise in addition to exploring technology integration of CB defense capabilities into combat platforms thus unencumbering the Warfighter.

MRDC laboratory infrastructure provides for laboratory operations, facilities sustainment, and regulatory compliance for critical CB defense activities at the U.S. Army Medical Research Institute for Infectious Diseases (USAMRIID) and the U.S. Army Medical Research Institute for Chemical Defense (USAMRICD) to counter an expanding threat space, exploit advances in technology, and develop and transition CB defense equipment and countermeasures to the Warfighter.

B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2022	FY 2023	FY 2024
Title: 1) LABINF - Chemical Biological Center (CBC) Laboratory Infrastructure	7.399	8.850	8.849
Description: Provides the necessary sustainment and modernization needed at key tier 1 laboratories at DEVCOM CBC. Affords DEVCOM CBC the ability to provide innovative chemical, biological, radiological, nuclear and explosive (CBRNE) defense capabilities that enable the joint warfighter's dominance on the battlefield and interagency defense of the homeland.			
FY 2023 Plans:			

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Chemical and Biological Defense Program		Date: March 2023
Appropriation/Budget Activity 0400 / 6	R-1 Program Element (Number/Name) PE 0605384BP / <i>Chemical and Biological Defense Program</i>	Project (Number/Name) LS6 / <i>Laboratory Support (Mgmt Support)</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2022	FY 2023	FY 2024
<p>Continuation of the sustainment and modernization efforts that support chemical and biological research, development, and life-cycle engineering capabilities at DEVCOM CBC. Continue testing and characterization to inform detection, protection, and decontamination capabilities as it relates to CB Protection systems and concepts. Continue Organization for the Prohibition of Chemical Weapons (OPCW) support mission to both the Warfighter and Homeland Defense. Conduct carbon testing and SMARTMAN mask tests to protect both the Warfighter and First Responders. Continue execution of Operational Toxicology research. Perform testing, validation, and certification of product lot acceptance and shelf-life extension for all Department of Defense (DoD) activated carbon products.</p> <p>FY 2024 Plans: Continues sustainment and modernization efforts that support chemical and biological research, development, and life-cycle engineering capabilities at DEVCOM CBC. Supports permeation testing of military issued gloves, airline hoses, and other permeable, semi-permeable, and non-permeable materials used to support the warfighter. Supports First Article Production Lot Acceptance testing as dictated by various military specifications. Modernizes two steam baths used in the decontamination of chemical agent contaminated test articles that support both the warfighter and first responders.</p> <p>FY 2023 to FY 2024 Increase/Decrease Statement: Minor change due to routine program adjustments.</p>			
<p>Title: 2) LABINF - Medical Research and Development Command (MRDC) Laboratory Infrastructure</p> <p>Description: U.S. Army Medical Research Institute for Infectious Diseases (USAMRIID) and the U.S. Army Medical Research Institute for Chemical Defense (USAMRICD) provides support to laboratory infrastructure for laboratory operations, facilities sustainment, and regulatory compliance for critical chemical biological defense activities.</p> <p>FY 2023 Plans: Funds will continue to support laboratory infrastructure for laboratory operations, facilities sustainment, and regulatory compliance for critical chemical biological defense activities at USAMRIID and USAMRICD. Activities supported include elements of laboratory support operations, maintenance and repair of existing capabilities, chemical agent security, quality systems compliance, chemical and biological safety, and/or research protections. Sustain Joint Worldwide Intelligence Communications System (JWICS) access at USAMRICD for Top Secret (TS) and TS/Sensitive Compartmented Information (SCI) onsite communication. The SCIF will assist with ensuring USAMRICD meets all security regulations and policies related to its chemical defense mission.</p> <p>FY 2024 Plans: Continue support laboratory infrastructure for laboratory operations, facilities sustainment, and regulatory compliance for critical chemical and biological defense activities at USAMRIID and USAMRICD. Support includes elements of laboratory support operations, maintenance and repair of existing capabilities, chemical and biological agent security, quality systems compliance,</p>	1.260	1.337	1.441

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Chemical and Biological Defense Program		Date: March 2023
Appropriation/Budget Activity 0400 / 6	R-1 Program Element (Number/Name) PE 0605384BP / <i>Chemical and Biological Defense Program</i>	Project (Number/Name) LS6 / <i>Laboratory Support (Mgmt Support)</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2022	FY 2023	FY 2024
chemical and biological safety, key maintenance contracts, and/or research protections. Reimburse provider for JWICS access at USAMRICD for TS and TS/SCI onsite communication. The SCIF ensures USAMRICD meets all security regulations and policies related to its chemical defense mission.			
<i>FY 2023 to FY 2024 Increase/Decrease Statement:</i> Minor change due to routine program adjustments.			
Accomplishments/Planned Programs Subtotals	8.659	10.187	10.290

C. Other Program Funding Summary (\$ in Millions)

N/A

Remarks

D. Acquisition Strategy

N/A

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Chemical and Biological Defense Program **Date:** March 2023

Appropriation/Budget Activity 0400 / 6	R-1 Program Element (Number/Name) PE 0605384BP / <i>Chemical and Biological Defense Program</i>	Project (Number/Name) MS6 / <i>Management Support (Mgmt Support)</i>
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COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To	Total
											Complete	Cost
MS6: <i>Management Support (Mgmt Support)</i>	-	41.950	52.855	64.092	0.000	64.092	63.467	65.030	65.088	62.852	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Management Support Research, Development, Test, and Evaluation (RDT&E) Project provides management support for the Department of Defense (DoD) Chemical and Biological Defense Program (CBDP). It includes program oversight and integration of overall non-Chemical Biological Radiological Nuclear (CBRN) Defense Equipment (non-CDE) and CBRN Defense Equipment (CDE) programs by the Assistant Secretary of Defense for Nuclear, Chemical, and Biological Defense Programs (ASD(NCB)) and defense programs through the Deputy Assistant Secretary of Defense for Chemical and Biological Defense (DASD(CBD)).

Efforts included in this Project are:

- (1) Biological Select Agent and Toxins (BSAT) Biorisk Program Office (BBPO),
- (2) Biodefense Materiel Readiness Common Operating Picture (BDMR COP),
- (3) Executive Agent Management (EA MGT),
- (4) Joint Acquisition CB Knowledge System Defense Business System (JACKS DBS),
- (5) Joint Concepts, Studies, and Analysis (JCSA),
- (6) Joint Requirements Office Management (JRO MGT),
- (7) Joint Test Infrastructure Working Group (JTIWG),
- (8) Office of the Secretary of Defense Management (OSD MGT),
- (9) Joint CBRN Defense Program Analysis and Integration Office Management (PAIO MGT), and
- (10) Workforce and Biosafety - Enhanced Biodefense (WB-ENBD)

BSAT BBPO supports the DoD EA and EA Responsible Official (EARO) for BSAT Biosafety and Biosecurity Programs in their responsibilities for mission oversight, technical review, inspection, harmonization of biosafety and biosecurity protocols and procedures across DoD laboratories handling BSAT. Efforts also support the Scientific Gaps in Biorisk Research Program (SGBRP) to address gaps in scientific knowledge to facilitate validation of BSAT protocols and procedures. Closing these gaps will reduce the inherent risks associated with BSAT research in CBDP laboratories and supports research and development work on priority agents. Research projects, selected from an order of merit list are funded for one year.

The BDMR COP will increase situational awareness of biodefense readiness through a biodefense logistics common operating picture (COP) to ensure preparedness and enable a more rapid response to biological threats. The platform will enable the biodefense enterprise to monitor assets and acquisition programs to consolidate data streams into executive dashboards, working level planning tools to provide material readiness status, and provide supply chain visibility and illuminations. This situational awareness of required biodefense materiel capabilities, including medical and non-medical personal protective equipment, will also enable leaders to track

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Chemical and Biological Defense Program	Date: March 2023
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Appropriation/Budget Activity 0400 / 6	R-1 Program Element (Number/Name) PE 0605384BP / <i>Chemical and Biological Defense Program</i>	Project (Number/Name) MS6 / <i>Management Support (Mgmt Support)</i>
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and manage the necessary capabilities to protect the Total Force and mitigate the effects of biological incidents. This effort will enable a holistic approach to addressing supply chain risk management, resiliency and security to across the entire biological defense aperture.

EA MGT, as the DoD Executive Agent for the CBDP, is responsible for coordinating and integrating research, development, test, and evaluation and acquisition requirements of the Military Departments and National Guard Bureau; and reviewing all funding requirement through the Planning, Programming, Budgeting, and Execution (PPBE) process for the CBDP enterprise.

JACKS DBS is a flexible, web-hosted CBRN data warehouse that provides the Warfighter, first responders and other users with a centralized, authoritative, and comprehensive source of CBRN information. JACKS also supports the acquisition domain by utilizing cutting edge information technology solutions and business intelligence tools to provide the Joint Force with the ability to mine data and create interactive data visualizations.

JCSA, through the Joint Requirements Office (JRO) for CBRN Defense, a Chairman's Controlled Activity aligned under the Joint Staff J8, is responsible for supporting foundational Joint Concepts development, studies, and analyses to enable requirements and capabilities development of both medical and physical CBRN defense systems; coordinates WMD/CBRN threat information requirements; and conducts integrated CBRN risk assessments.

JRO MGT, through the Joint Requirements Office (JRO) for CBRN Defense, a Chairman's Controlled Activity aligned under the Joint Staff J8, is responsible for representing the Services and Combatant Commands (CCMD) in the requirements generation process for the development of Joint materiel and non-materiel solutions in the medical and physical CBRN defense mission areas. Directly supports the improvement of CBRN defense-related leadership development, education, and training at the Joint and Service levels and provides technical and subject matter expert support in the areas of CBRN Defense/Countering Weapons of Mass Destruction (CWMD), including during CCMD exercises.

JTIWG, through the Chemical, Biological, Radiological and Nuclear Defense (CBRND) Test and Evaluation (T&E) Executive, is responsible for the planning, balancing, and oversight of test infrastructure and test technology requirements to support Developmental Testing (DT) and Operational Testing (OT) of DoD CBRND systems. The JTIWG program supports T&E Early Involvement; test threat planning; T&E studies; and T&E standards planning and development to support CBRND testing for all Services to include medical T&E efforts. The CBRND T&E Executive oversees the Enterprise processes to develop and sustain standardized T&E methodologies and validated instrumentation and infrastructure to ensure the adequacy of test for CBRND systems in alignment with acquisition milestones and associated decision points. The CBRND T&E Executive provides the T&E infrastructure investment strategy and coordinates investment planning and T&E capabilities validation among the Joint Service Community to ensure that program needs are met. The CBRND T&E Executive oversees the T&E processes to ensure end to end feedback loops to support to the Warfighter.

OSD MGT performs program reviews/assessments, provides programmatic PPBE oversight/analysis, provides Congressional issue analysis and support, and financial management. OSD MGT also provides the CBDP Enterprise all aspects of accounting, to include financial statements, reconciliation of budgetary and proprietary accounts, and compliance.

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Chemical and Biological Defense Program **Date:** March 2023

Appropriation/Budget Activity 0400 / 6	R-1 Program Element (Number/Name) PE 0605384BP / <i>Chemical and Biological Defense Program</i>	Project (Number/Name) MS6 / <i>Management Support (Mgmt Support)</i>
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PAIO MGT conducts independent analysis and provides objective advice to the CBDP and the Countering Weapons of Mass Destruction (CWMD) stakeholders to inform senior leader decision-making across the DoD and whole of government partners. PAIO ensures CBRN defense programs mission areas, policies, and processes support operational requirements, promote efficiency and readiness, and meet national security objectives.

WB-ENBD provides centralized DoD expertise, implements biosafety improvements, and adds protections for CBDP defense industrial supply chain and intellectual property.

B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2022	FY 2023	FY 2024
<p>Title: 1) OSD BIOSAFETY</p> <p>Description: Biological Select Agent and Toxins (BSAT) Support</p> <p>FY 2023 Plans: Continue to maintain the Joint Interagency Biorisk Program System (JIBS) (Defense BSAT Business System), continue to perform laboratory site visits, participate and oversee laboratory inspections, execute stakeholders meetings, Biorisk Scientific Review Panel (BSRP) meetings, Scientific Gaps in Biorisk Research Program (SGBRP) committees, contribute towards harmonization of the biosafety and biosecurity across Department of Defense (DoD) BSAT registered laboratories.</p> <p>FY 2024 Plans: Continue to maintain the Joint Interagency Biorisk Program System (JIBS) (Defense BSAT Business System), continue to perform laboratory site visits, participate and oversee laboratory inspections, execute stakeholders meetings, BSRP meetings, SGBRP committees, contribute towards harmonization of the biosafety and biosecurity across DoD BSAT registered laboratories.</p> <p>FY 2023 to FY 2024 Increase/Decrease Statement: Minor change due to routine program adjustments.</p>	1.956	1.824	1.955
<p>Title: 2) BSAT RSRCH SPT</p> <p>Description: Scientific Gaps in Biorisk Research Program (SGBRP) Support</p> <p>FY 2023 Plans: Select gap research projects based on a new order of merit list, while remaining in accordance with the Scientific Gap Biorisk Research Program (SGBRP) Charter.</p> <p>FY 2024 Plans: Select gap research projects based on a new order of merit list, while remaining in accordance with the Scientific Gap Biorisk Research Program (SGBRP) Charter.</p> <p>FY 2023 to FY 2024 Increase/Decrease Statement:</p>	0.806	0.748	0.806

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Chemical and Biological Defense Program		Date: March 2023
Appropriation/Budget Activity 0400 / 6	R-1 Program Element (Number/Name) PE 0605384BP / <i>Chemical and Biological Defense Program</i>	Project (Number/Name) MS6 / <i>Management Support (Mgmt Support)</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2022	FY 2023	FY 2024
Minor change due to routine program adjustments.			
<p>Title: 3) BDMR COP</p> <p>Description: Enables a logistic common operating picture (COP) framework and platform for biodefense supply chain risk management.</p> <p>FY 2024 Plans: Initiate management support and activities for the execution of a logistic COP to enable situational awareness across biodefense materials to include both medical and non-medical personal protective equipment. Supports multiple support contracts to enable a holistic view to ensure complete readiness across biological defense material solutions.</p> <p>FY 2023 to FY 2024 Increase/Decrease Statement: Additional investment to advance the overarching goals aligned with the 2022 National Biodefense Strategy and Implementation Plan (NBS).</p>	-	-	5.200
<p>Title: 4) EA MGT</p> <p>FY 2023 Plans: Funds will continue providing support to the DoD EA to conduct coordination and integration of the RDT&E and acquisition requirements of the military departments for CB warfare defense programs of the DoD and review all funding requirements for the CBDP as codified in public law and DoDD 5160.05E.</p> <p>FY 2024 Plans: Provide subject matter expertise and acquisition program management to work across research, development, test and evaluation and acquisition functions. Conduct reviews and assessments of current CBRN strategy, guidance and plans to identify and inform solutions for issues requiring EA decision, coordination, and integration.</p> <p>FY 2023 to FY 2024 Increase/Decrease Statement: Increase due to change in program/project schedule.</p>	0.940	0.872	1.024
<p>Title: 5) JACKS DBS</p> <p>Description: Provided CBRN Enterprise Services and Support</p> <p>FY 2023 Plans: Funds will update and streamline the JACKS user interface with a more modern look and feel. The updates to the user interface will provide users with a better overall user experience and enable them to find the information they need faster. Additionally, the</p>	3.128	3.246	3.650

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Chemical and Biological Defense Program		Date: March 2023
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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2022	FY 2023	FY 2024
<p>changes to the user interface will help improve data quality and integrity by making it easier to identify, report, and correct data fed to JACKS from external systems.</p> <p>FY 2024 Plans: JACKS will begin developing and deploying data marts into the JACKS Data Warehouse to reposition JACKS data into compartmentalized areas. The JACKS data marts will enable JACKS users to quickly make informed business decisions by curating authoritative Chemical Biological Defense Program data from various sources into a centralized location.</p> <p>FY 2023 to FY 2024 Increase/Decrease Statement: Minor change due to routine program adjustments.</p>			
<p>Title: 6) JCSA</p> <p>FY 2023 Plans: Funds will conduct the follow-on study/assessment to the FY20 CBRN Response Enterprise Capability Based Assessment. Initiate a Post-Integrated Early Warning Doctrine, Organization, Training, Materiel, Leadership and Education, Personnel, and Facilities (DOTMLPF-P) Change Recommendation Study/Assessment. Sponsor the first Personal Contamination Mitigation (Wound and Ocular Decontamination) Analysis of Alternatives. Plan and conduct all modelling and scenario development in support of CASSANDRA 24, the preeminent CBRN-focused Operational Risk Analysis exercise. Continue to update detailed operational risk analyses to support CBDP leadership decisions.</p> <p>FY 2024 Plans: Funds will be used to conduct studies/assessments and analysis in support of approved acquisition program requirements development to meet milestone decisions in coordination with the DASD(CBD) and CBDP Component organizations. Funding will additionally be used to plan and conduct CASSANDRA 24, the preeminent CBRN-focused Operational Risk Analysis exercise. Lastly, funds will continue to support detailed operational risk analyses to support CBDP leadership decisions and Joint Force planning constructs.</p>	-	1.320	1.320
<p>Title: 7) JRO MGT</p> <p>FY 2023 Plans: Funds will continue to represent the Services and Combatant Commands (CCMD) in the requirements generation process for Joint materiel and non-materiel solutions in the medical and physical CBRN defense mission areas; conduct foundational studies for the combating weapons of mass destruction (CWMD) / CBRN defense community; provide support to Joint and Multi-service doctrine development, including the preparation of various Joint publications which then inform Multi-service Tactics, Techniques and Procedures (MTTPs). Continue to support CBRN/CWMD training efforts at various Joint Senior Leadership schools. Continue to support COCOM scenario development and controller/evaluator training and provide expertise to CCMD exercises. Continue to chair the CWMD Working Group to ensure synchronized Joint Capabilities Integration and Development</p>	7.868	8.499	9.158

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Chemical and Biological Defense Program		Date: March 2023
Appropriation/Budget Activity 0400 / 6	R-1 Program Element (Number/Name) PE 0605384BP / <i>Chemical and Biological Defense Program</i>	Project (Number/Name) MS6 / <i>Management Support (Mgmt Support)</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2022	FY 2023	FY 2024
<p>System (JCIDS) documents are appropriately vetted and staffed prior to being brought to the Protection Functional Capabilities Board. Continue to chair the CBRN Support to Command and Control Sub-working Group supporting the C4Cyber Functional Capabilities Board (FCB) include the preparation and validation of Capability Development Packages and Capability Packages.</p> <p>FY 2024 Plans: Funds will continue to represent the Services and Combatant Commands (CCMD) in the requirements generation process for Joint materiel and non-materiel solutions in the medical and physical CBRN defense mission areas; conduct foundational studies for the combating weapons of mass destruction (CWMD) / CBRN defense community; provide support to Joint and Multi-service doctrine development, including the preparation of various Joint publications which then inform Multi-service Tactics, Techniques and Procedures (MTTPs). Continue to support CBRN/CWMD training efforts at various Joint Senior Leadership schools. Continue to support CCMD scenario development and controller/evaluator training and provide expertise to CCMD exercises. Continue to chair the CWMD Working Group to ensure synchronized Joint Capabilities Integration and Development System (JCIDS) documents are appropriately vetted and staffed prior to being brought to the Protection Functional Capabilities Board (P-FCB). Continue to chair the CBRN Support to Command and Control Sub-working Group supporting the C4Cyber Functional Capabilities Board (FCB) include the preparation and validation of Capability Development Packages and Capability Packages.</p> <p>FY 2023 to FY 2024 Increase/Decrease Statement: Minor change due to routine program adjustments.</p>			
<p>Title: 8) JTIWG</p> <p>FY 2023 Plans: Continue T&E Executive mission support to ensure credible testing; T&E Early Involvement; T&E Studies; evaluation and decision support for CBDP systems; support the DOT&E for OSD T&E Oversight; support the NCB in infrastructure planning; continue efforts to develop, refine, and/or streamline processes for identifying, assessing, and addressing gaps in T&E capabilities to ensure timely support to acquisition programs. Continue mission to improve the quality and reduce the costs of test planning and execution; eliminate unnecessary redundancies in test infrastructure. Continue efforts to identify and mitigate critical Test and Evaluation Gaps in order to reduce cost/test schedule impacts to near-term programs. Continue to align and streamline policies and processes to support more efficient and effective management and sustainment of test infrastructure and methodologies.</p> <p>FY 2024 Plans: Continue Test and Evaluation (T&E) Executive mission support to ensure credible testing; T&E Early Involvement; T&E Studies; evaluation and decision support for CBDP systems; support the Director of Operational T&E (DOT&E) for OSD T&E Oversight; support the NCB in infrastructure planning; continue efforts to develop, refine, and/or streamline processes for identifying, assessing, and addressing gaps in T&E capabilities to ensure timely support to acquisition programs. Continue mission to improve the quality and reduce the costs of test planning and execution; eliminate unnecessary redundancies in</p>	5.664	5.831	6.286

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Chemical and Biological Defense Program		Date: March 2023
Appropriation/Budget Activity 0400 / 6	R-1 Program Element (Number/Name) PE 0605384BP / <i>Chemical and Biological Defense Program</i>	Project (Number/Name) MS6 / <i>Management Support (Mgmt Support)</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2022	FY 2023	FY 2024
test infrastructure. Continue efforts to identify and mitigate critical T&E capability gaps in order to reduce cost/test schedule impacts to near-term programs. Continue aligning and streamlining policies and processes to support more efficient and effective management and sustainment of test infrastructure and methodologies. FY 2023 to FY 2024 Increase/Decrease Statement: Minor change due to routine program adjustments.			
Title: 9) OSD MGT FY 2023 Plans: Funds will continue performing program oversight/reviews/assessments, leading PPBE processes, and supporting strategic and Congressional engagements. Funds Defense Finance and Accounting Service transactions and direct support. Continues to support financial management and audit functions for the CBDP Enterprise including all aspects of accounting; financial statements; reconciliation of budgetary and proprietary accounts, processing of commitments and obligations; financial accounting compliance; funds management and control; management of the Managers' Internal Control Program and financial systems integration and coordination. FY 2024 Plans: Funds continue performing program reviews/assessments, providing planning, programming, budgeting, and execution (PPBE) oversight/analysis, and providing Congressional issue analysis and support. Supporting financial management services provided by the Defense Threat Reduction Agency (DTRA), such as funding distribution and execution reporting. Continue to provide the CBDP Enterprise all aspects of accounting; financial statements; reconciliation of budgetary and proprietary accounts, processing of commitments and obligations; financial accounting compliance; funds management and control; management of the Managers' Internal Control Program and financial systems integration and coordination. FY 2023 to FY 2024 Increase/Decrease Statement: Increased support for strategic high priority efforts.	13.698	15.565	18.001
Title: 10) PAIO MGT FY 2023 Plans: Funds will continue to analyze and evaluate CWMD defense plans, programs, and budgets in relation to U.S. defense objectives, projected threats, allied contributions, estimated costs, and resource constraints. Review, analyze, and evaluate CWMD defense programs for execution of approved strategies and policies. Promote improved analytical skills and competencies, tools, data, and methods for analyzing CWMD defense planning and the allocation of resources. Ensure that the costs/budget justification for	7.890	8.592	9.692

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Chemical and Biological Defense Program		Date: March 2023
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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2022	FY 2023	FY 2024
<p>CWMD defense programs are presented accurately and completely. Provide independent analytic advice and evaluate alternative policies to ensure that CWMD defense programs can be implemented.</p> <p>FY 2024 Plans: Funds will continue to analyze and evaluate CWMD defense plans, programs, and budgets in relation to U.S. defense objectives, projected threats, allied contributions, estimated costs, and resource constraints. Review, analyze, and evaluate CWMD defense programs for execution of approved strategies and policies. Promote improved analytical skills and competencies, tools, data, and methods for analyzing CWMD defense planning and the allocation of resources. Ensure that the costs/budget justification for CWMD defense programs are presented accurately and completely. Provide independent analytic advice and evaluate alternative policies to ensure that CWMD defense programs can be implemented.</p> <p>FY 2023 to FY 2024 Increase/Decrease Statement: Increase due to change in program/project technical parameters.</p>			
<p>Title: 11) WB-ENBD</p> <p>Description: This effort will focus on Biodefense and Biosafety Expertise & Technology Protection & Supply Chain Risk Management (Biosecurity)</p> <p>FY 2023 Plans: Supported CBDP biosafety and biosecurity (biorisk) priorities through biosafety personnel retention and development, biorisk research to close gaps in scientific knowledge to facilitate validation of DoD biological agent procedures and protocols, and tools to manage and ensure DoD biorisk. Implementing an enduring capability to surveil, address threats, and mitigate risks related to the CBDP supply chain, its cybersecurity, protection of intellectual property, and information security.</p> <p>FY 2024 Plans: Support CBDP biosafety and biosecurity (biorisk) priorities through biosafety personnel retention and development, biorisk research to close gaps in scientific knowledge to facilitate validation of DoD biological agent procedures and protocols, and tools to manage and ensure DoD biorisk. Continue implementing an enduring capability to surveil, address threats, and mitigate risks related to the CBDP supply chain, its cybersecurity, protection of intellectual property, and information security.</p> <p>FY 2023 to FY 2024 Increase/Decrease Statement: Minor change due to routine program adjustments.</p>	-	6.358	7.000
Accomplishments/Planned Programs Subtotals	41.950	52.855	64.092

C. Other Program Funding Summary (\$ in Millions) N/A

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Chemical and Biological Defense Program		Date: March 2023
Appropriation/Budget Activity 0400 / 6	R-1 Program Element (Number/Name) PE 0605384BP / <i>Chemical and Biological Defense Program</i>	Project (Number/Name) MS6 / <i>Management Support (Mgmt Support)</i>

C. Other Program Funding Summary (\$ in Millions)

Remarks

D. Acquisition Strategy

N/A

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Chemical and Biological Defense Program										Date: March 2023		
Appropriation/Budget Activity 0400 / 6					R-1 Program Element (Number/Name) PE 0605384BP / <i>Chemical and Biological Defense Program</i>				Project (Number/Name) DT6 / <i>Joint Doctrine And Training Support (Mgmt Support)</i>			
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
DT6: <i>Joint Doctrine And Training Support (Mgmt Support)</i>	-	0.836	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.836
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Joint Doctrine and Training Support Research, Development, Test, and Evaluation (RDT&E) Management Support Project provides the Joint Requirements Office for Chemical, Biological, Radiological and Nuclear Defense (JRO-CBRND) Training and Leader Education program directly supporting the Chemical Biological Defense Program (CBDP). In FY2023, the CBDP RDT&E Projects have been restructured to align to the CBDP Portfolio. DT6 efforts in FY2022 progress to the Management Support (MS6) portfolio. This restructuring is intended to provide standardization and alignment across CBDP research, development and acquisition efforts.

Efforts included in this Project are:

- (1) Joint Requirements Office Doctrine and Training (JRO DT) ****Progresses to MS6 in FY2023****

JRO DT develops Joint Chemical, Biological, Radiological, and Nuclear (CBRN) defense capability requirements and the improvement of CBRN defense related education and training at the Joint and Service levels. This requirement provides technical and subject matter expert support in the areas of CBRN Defense (CBRND) and Countering Weapons of Mass Destruction (CWMD). Joint and Service training, leadership development, and education includes: (1) The CBDP Joint Senior Leader Course (JSLC) and (2) Assistance in correcting training and doctrine deficiencies covered in the lessons learned process, combat operations, capability development studies and Department of Defense Inspector General (DoDIG) and Government Accountability Office (GAO) reports. Provide contract support to the CBDP-directed Graduate Fellowship Program in CBRN/CWMD Studies.

B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2022	FY 2023	FY 2024
Title: 1) JRO DT	0.836	-	-
Description: Supports Joint Doctrine, Training, Leader Development & Education.			
Accomplishments/Planned Programs Subtotals	0.836	-	-

C. Other Program Funding Summary (\$ in Millions)

N/A

Remarks

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Chemical and Biological Defense Program		Date: March 2023
Appropriation/Budget Activity 0400 / 6	R-1 Program Element (Number/Name) PE 0605384BP / <i>Chemical and Biological Defense Program</i>	Project (Number/Name) DT6 / <i>Joint Doctrine And Training Support (Mgmt Support)</i>

D. Acquisition Strategy
N/A

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Chemical and Biological Defense Program **Date:** March 2023

Appropriation/Budget Activity 0400 / 6	R-1 Program Element (Number/Name) PE 0605384BP / <i>Chemical and Biological Defense Program</i>	Project (Number/Name) O49 / <i>Joint Concept Development (Mgmt Support)</i>
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COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
O49: <i>Joint Concept Development (Mgmt Support)</i>	-	1.214	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.214
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-	-	-

A. Mission Description and Budget Item Justification

The Joint Concept Development Research, Development, Test, and Evaluation (RDT&E) Management Support Project supports the Joint Requirements Office and the Chairman's Risk Assessment Process by producing, coordinating, & executing Chemical, Biological, Radiological, and Nuclear (CBRN) defense studies, experiments, analyses, and architecture, in order to develop future operational concepts and support the efficient and effective generation of CBRN requirements. In FY2023, the CBDP RDT&E Projects have been restructured to align to the CBDP Portfolio. O49 efforts in FY2022 progress to the Management Support (MS6) portfolio. This restructuring is intended to provide standardization and alignment across CBDP research, development and acquisition efforts.

Efforts included in this Project are:

(1) Joint Concepts, Studies, and Analyses (JCSA) ****Progresses to MS6 in FY2023****

JCSA provides specific lines of effort to include: qualitatively characterizing emerging CBRN threats and operational risks to the Joint Force; conducting innovative approaches to deal with technical studies; analyzing Concepts of Operations (CONOPS) for employing and developing capabilities; and analyzing specific issues as part of program development.

B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2022	FY 2023	FY 2024
Title: 1) JCSA	1.214	-	-
Description: Support to JCSA			
Accomplishments/Planned Programs Subtotals	1.214	-	-

C. Other Program Funding Summary (\$ in Millions)

N/A

Remarks

D. Acquisition Strategy

N/A

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Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Chemical and Biological Defense Program **Date:** March 2023

Appropriation/Budget Activity 0400: <i>Research, Development, Test & Evaluation, Defense-Wide / BA 6: RDT&E Management Support</i>	R-1 Program Element (Number/Name) PE 0605502BP / <i>Small Business Innovative Research - Chemical Biological Def</i>
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COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
Total Program Element	0.000	21.179	2.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	23.179
SB6: <i>Small Business Innovative Research (Mgmt Support)</i>	-	21.179	2.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	23.179

A. Mission Description and Budget Item Justification

The overall objective of the Chemical Biological Defense (CBD) Small Business Innovative Research (SBIR) program is to improve the transition or transfer of innovative CBD technologies between Department of Defense (DoD) components and the private sector for mutual benefit. The CBD SBIR program includes those technology efforts that maximize a strong defensive posture in a biological or chemical environment using passive and active means as deterrents. These technologies include chemical and biological detection; information assessment, which includes identification, modeling, and intelligence; contamination avoidance; and protection of both individual soldiers and equipment.

B. Program Change Summary (\$ in Millions)

	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024 Base</u>	<u>FY 2024 OCO</u>	<u>FY 2024 Total</u>
Previous President's Budget	0.000	0.000	0.000	-	0.000
Current President's Budget	21.179	2.000	0.000	-	0.000
Total Adjustments	21.179	2.000	0.000	-	0.000
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	2.000			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	21.179	-			
• Other Adjustments	-	-	0.000	-	0.000

Congressional Add Details (\$ in Millions, and Includes General Reductions)

Project: SB6: *Small Business Innovative Research (Mgmt Support)*

Congressional Add: *Infectious Disease Diagnostics*

	FY 2022	FY 2023
	-	2.000
Congressional Add Subtotals for Project: SB6	-	2.000
Congressional Add Totals for all Projects	-	2.000

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Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Chemical and Biological Defense Program Date: March 2023

Appropriation/Budget Activity	R-1 Program Element (Number/Name)
0400: <i>Research, Development, Test & Evaluation, Defense-Wide</i> / BA 6: <i>RDT&E Management Support</i>	PE 0605502BP / <i>Small Business Innovative Research - Chemical Biological Def</i>

Change Summary Explanation

Funding: FY2022 (+\$21.179 Million): Funding transferred and applied to Small Business Innovative Research program.

FY2023 (+\$2.000 Million): Congressional Add for infectious disease diagnostics.

Schedule: N/A

Technical: N/A

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Chemical and Biological Defense Program										Date: March 2023		
Appropriation/Budget Activity 0400 / 6					R-1 Program Element (Number/Name) PE 0605502BP / <i>Small Business Innovative Research - Chemical Biological Def</i>				Project (Number/Name) SB6 / <i>Small Business Innovative Research (Mgmt Support)</i>			
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
SB6: <i>Small Business Innovative Research (Mgmt Support)</i>	-	21.179	2.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	23.179
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Small Business Innovative Research (SBIR) Program is a Congressionally mandated program established to increase the participation of small business in federal research and development (R&D). Currently, each participating Government agency must reserve 3.2% of its extramural R&D for SBIR awards to competing small businesses. The goal of the SBIR Program is to invest in the innovative capabilities of the small business community to help meet Government R&D objectives while allowing small companies to develop technologies and products which they can then commercialize through sales back to the Government or in the private sector.

The Small Business Technology Transfer (STTR) Program like SBIR, is a Government-wide program, mandated by the Small Business Research and Development Enhancement Act of 1992, Public Law (PL) 102-564. STTR was established as a companion program to the SBIR Program and is executed in essentially the same manner; however, there are several distinct differences. The STTR Program provides a mechanism for participation by university, Federally-Funded Research and Development Centers (FFRDCs), and other non-profit research institutions. Specifically, the STTR Program is designed to provide an incentive for small companies and research at academic institutions and non-profit research and development institutions to work together to move emerging technical ideas from the laboratory to the marketplace to foster high-tech economic development and to advance U.S. economic competitiveness. Each STTR proposal must be submitted by a team which includes a small business (as the prime contractor for contracting purposes) and at least one research institution, which have entered into a Cooperative Research and Development Agreement for the purposes of the STTR effort. Furthermore, the project must be divided up such that the small business performs at least 40% of the work and the research institution(s) performs at least 30% of the work. The remainder of the work may be performed by either party or a third party. The budget is separate from the SBIR budget and is significantly smaller (0.45% of the extramural R&D budget vs. 3.2% for the SBIR Program).

The overall objective of the CBD SBIR/STTR program is to improve the transition or transfer of innovative CBD technologies between DoD components and the private sector for mutual benefit. The CBD program includes those technology efforts that maximize a strong defensive posture in a biological or chemical environment using passive and active means as deterrents. These technologies include chemical and biological detection; information assessment, which includes identification, modeling, and intelligence; contamination avoidance; and protection of both individual soldiers and equipment. The executive agent for the SBIR/STTR portion of the CBDP is the Army Research Office-Washington.

B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2022	FY 2023	FY 2024
Title: 1) ZSBIR	21.179	0.000	0.000
Description: Small Business Innovative Research/Small Business Technology Transfer (SBIR/STTR)			
FY 2023 Plans:			

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Chemical and Biological Defense Program **Date:** March 2023

Appropriation/Budget Activity 0400 / 6	R-1 Program Element (Number/Name) PE 0605502BP / <i>Small Business Innovative Research - Chemical Biological Def</i>	Project (Number/Name) SB6 / <i>Small Business Innovative Research (Mgmt Support)</i>
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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2022	FY 2023	FY 2024
<ul style="list-style-type: none"> - Sensor – Battlespace Environments (\$4.4 Million): Artificial Intelligence (AI)-based Real-time Automatic 3D Reconstruction and 3D Model Generation from Multiple Image Sources for Situational Awareness and Transport and Dispersion Modeling. - Detection – Sensors (\$2.2 Million): Development and Testing of Contact-Free Methods for Classifying the Morphological Properties of Aerosols. - Individual Protection (\$4.4 Million): Non-Perfluoroalkyl and Non-Polyfluoroalkyl Substances (PFAS) Elastomeric Chemical Barrier Materials; Non-PFAS (Perfluoroalkyl or Polyfluoroalkyl Substances) Liquid Repellant Coatings. - Canine Protection (\$2.2 Million): Collapsible and Protective Portable Canine Shelter. - Point Detection (\$3.3 Million): Millimeter Wave Imaging with High-Electron-Mobility Transistors (HEMT) or Schottky Diode Rectifiers. <p>FY 2024 Plans:</p> <ul style="list-style-type: none"> - Medical Pretreatments (estimated funding, \$2.2 Million) - Medical Diagnostics (estimated funding, \$2.2 Million) - Medical Therapeutics – Biological Countermeasures (estimated funding, \$3.3 Million) - Medical Therapeutics – Chemical Countermeasures (estimated funding, \$2.2 Million) 			
Accomplishments/Planned Programs Subtotals	21.179	0.000	0.000

	FY 2022	FY 2023
Congressional Add: Infectious Disease Diagnostics	-	2.000
FY 2023 Plans: Conduct infectious disease diagnostics.		
Congressional Adds Subtotals	-	2.000

C. Other Program Funding Summary (\$ in Millions)

N/A

Remarks

D. Acquisition Strategy

N/A

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Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Chemical and Biological Defense Program **Date:** March 2023

Appropriation/Budget Activity 0400: <i>Research, Development, Test & Evaluation, Defense-Wide I BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 0607384BP / <i>Chemical and Biological Defense (Operational Systems Development)</i>
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COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
Total Program Element	0.000	55.359	65.588	80.495	0.000	80.495	83.683	89.178	84.877	66.102	Continuing	Continuing
UN7: <i>Understand (Op Sys Dev)</i>	-	0.000	40.414	50.603	0.000	50.603	58.881	71.869	68.839	50.628	Continuing	Continuing
PT7: <i>Protect (Op Sys Dev)</i>	-	0.000	20.076	26.818	0.000	26.818	22.815	15.490	14.193	13.612	Continuing	Continuing
MT7: <i>Mitigate (Op Sys Dev)</i>	-	0.000	5.098	3.074	0.000	3.074	1.987	1.819	1.845	1.862	Continuing	Continuing
CA7: <i>Contamination Avoidance (Op Sys Dev)</i>	-	12.244	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	12.244
CM7: <i>Homeland Defense (Op Sys Dev)</i>	-	1.463	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.463
C07: <i>Collective Protection (Op Sys Dev)</i>	-	9.645	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	9.645
DE7: <i>Decontamination (Op Sys Dev)</i>	-	1.020	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.020
IP7: <i>Individual Protection (Op Sys Dev)</i>	-	11.659	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	11.659
IS7: <i>Information Systems (Op Sys Dev)</i>	-	14.589	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	14.589
MB7: <i>Medical Biological Defense (Op Sys Dev)</i>	-	3.726	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	3.726
MC7: <i>Medical Chemical Defense (Op Sys Dev)</i>	-	1.013	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.013

A. Mission Description and Budget Item Justification

This program element (PE) resources Operational System Development across the Understand, Protect, and Mitigate portfolios. Chemical Biological Defense Program (CBDP) investments provide an integrated, layered capability to enable Countering Weapons of Mass Destruction (CWMD) missions ranging from combat operations to Department of Defense (DoD) support to domestic incident prevention and response. The Projects in this PE support the upgrade of systems that have been fielded or have received approval for full-rate production in order to maintain Joint Force readiness.

Individual Projects include:

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Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Chemical and Biological Defense Program	Date: March 2023
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Appropriation/Budget Activity 0400: <i>Research, Development, Test & Evaluation, Defense-Wide I BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 0607384BP / <i>Chemical and Biological Defense (Operational Systems Development)</i>
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- Understand (UN7): Technology refresh, modernization and continuous engineering of software applications and information systems to shape and inform the battlespace against CBRN threats. Continued development and testing of CB sensor equipment to maintain system interoperability with emerging information technology and decrease size, weight, and power requirements to reduce the logistical burden of associated capabilities. Technology refresh of fielded medical diagnostic systems and associated capabilities (e.g., assays) that contribute to the layered medical defenses against biological warfare agents and upgrade of fielded medical nerve agent treatment system that contribute to the layered medical defenses against chemical warfare agent threats facing U.S. Forces in the field.

- Protect (PT7): Efforts to refresh technology of fielded individual and protective equipment that enables the Joint Force to operate in a contaminated chemical, biological, and radiological (CBR) environment with little or no degradation of performance. Technology refresh efforts for fielded collective protection systems that are smaller, lighter, less costly to produce and maintain, and more logistically supportable, enabling mission accomplishment in spaces safe from the effects of CBR contamination.

- Mitigate (MT7): Technology refresh of fielded Contamination Mitigation (ConMit) systems that will remove and/or detoxify contaminated material without damaging combat equipment, personnel, or the environment.

- Contamination Avoidance (CA7), Homeland Defense (CM7), Collective Protection (C07), Decontamination (DE7), Individual Protection (IP7), Information Systems (IS7), Medical Biological Defense (MB7) and Medical Chemical Defense (MC7) are no longer active FY24 Projects due to budget restructuring.

The projects in this PE support operational systems development necessary to maintain operational effectiveness and are, therefore, correctly placed in Budget Activity 7.

B. Program Change Summary (\$ in Millions)	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Previous President's Budget	58.261	68.030	55.189	-	55.189
Current President's Budget	55.359	65.588	80.495	-	80.495
Total Adjustments	-2.902	-2.442	25.306	-	25.306
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-2.442			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-1.937	-			
• SBIR/STTR Transfer	-0.965	-			
• Other Adjustments	-	-	25.306	-	25.306

Change Summary Explanation

Funding: FY 2022 (-\$1.937 Million): Below threshold reprogramming to System Development & Demonstration, Budget Activity 5 in support of sensor and detection efforts.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Chemical and Biological Defense Program		Date: March 2023
Appropriation/Budget Activity 0400: <i>Research, Development, Test & Evaluation, Defense-Wide I BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 0607384BP / <i>Chemical and Biological Defense (Operational Systems Development)</i>	
FY 2022 (-\$0.965 Million): Transfer of funding to support Small Business Innovative Research/Small Business Technology Transfer efforts.		
FY 2023 (-\$2.442 Million): Congressional Directed Reductions.		
FY 2024 (+\$25.306 Million): Increase for Departmental inflation rate adjustments (+\$0.403 Million) and to address modernization, obsolescence and continuous engineering of collective protection systems, sensor equipment and information systems, and CBRN medical devices. These efforts will increase the readiness, sustainability, reliability, and affordability of these systems.		
Schedule: N/A		
Technical: N/A		

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Chemical and Biological Defense Program										Date: March 2023		
Appropriation/Budget Activity 0400 / 7					R-1 Program Element (Number/Name) PE 0607384BP / <i>Chemical and Biological Defense (Operational Systems Development)</i>				Project (Number/Name) UN7 / <i>Understand (Op Sys Dev)</i>			
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
UN7: <i>Understand (Op Sys Dev)</i>	-	0.000	40.414	50.603	0.000	50.603	58.881	71.869	68.839	50.628	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Understand Operational System Development Project provides the Joint Force continued readiness of fielded sensor, information technology and medical diagnostic capabilities and provides size, weight and power improvements to reduce logistical burden on the Warfighter and Services. In FY 2023, the Chemical Biological Defense Program (CBDP) RDT&E Projects were restructured to align with the CBDP portfolio construct. UN7 efforts in FY 2022 remain in Projects CA7, CM7, IP7, IS7, and MB7. This restructuring provided standardization and alignment across CBDP research, development and acquisition efforts.

Efforts included in this Project are:

- (1) Modernization Chemical Biological Radiological Nuclear Information Systems (MOD CBRN IS),
- (2) CBRN Support to Command and Control (CSC2),
- (3) Enhanced Maritime Biological Detection (EMBD),
- (4) Reactive Chemistry Orthogonal Surface and Environmental Threat Ticket Array (ROSETTA),
- (5) Modernization Sensors (MOD SEN),
- (6) Modernization Medical (MOD MED),
- (7) Special Purpose Unit Rapid Capability Development and Deployment (SPU RCDD), and
- (8) Weapons of Mass Destruction - Civil Support Team (WMD CST)

MOD CBRN IS combines CBRN IS (Cloud), Joint Effects Model (JEM), the Joint Warning and Reporting Network (JWARN), and the Software Support Activity within one portfolio. MOD CBRN IS provides for the continuous engineering and sustainment efforts to modernize capabilities and conduct Post Deployment Software Support (PDSS) to fielded CBRN software programs. Activities include: software code updates and modernization to correct deficiencies; compliance with system architectural changes to ensure interoperability; cybersecurity updates ensuring compliance with policies and standards; test and evaluation to identify possible cybersecurity vulnerabilities; configuration management; software redistribution, documentation, and training. In FY24, MOD CBRN IS funding will be consolidated under CBRN Support to Command and Control (CSC2).

Effort consolidates CBRN Support to Command and Control (CSC2) with MOD CBRN IS in order to gain efficiencies of managing funding and programmatic efforts under one line. Additionally, it allows the consolidation of continuous engineering for the currently deployed legacy CBRN information systems (Joint Effects Model (JEM)/Joint Warning and Reporting Network (JWARN), CBRN Information System (CBRN IS)). Effort encompasses the processes, procedures, people, material and information required to support and modernize fielded CBRN information systems and applications. Legacy capabilities and efforts will be transitioned to the CSC2 Capability set in the FY27-29 time frame, maintaining the stopgap capability for CBRN warning, reporting, and effects modeling while setting conditions for the sun

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Chemical and Biological Defense Program	Date: March 2023
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Appropriation/Budget Activity 0400 / 7	R-1 Program Element (Number/Name) PE 0607384BP / <i>Chemical and Biological Defense (Operational Systems Development)</i>	Project (Number/Name) UN7 / <i>Understand (Op Sys Dev)</i>
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setting of the legacy capabilities. The approach to consolidate simplifies software BA7 management under one line and synchronizes the sunset of legacy JEM and JWARN capabilities as replacement capabilities are deployed through CSC2.

The EMBD program will undertake engineering efforts to combat Diminishing Manufacturing Sources and Material Shortages (DMSMS) and maintain a stable production line. The EMBD program will address major obsolescence problems identified by the prime contractor that could affect a stable production line and to ensure new EMBD hardware/software remains procurable, field upgradeable and backwards compatible with previously fielded units. In FY24, EMBD will undertake engineering efforts to resolve obsolescence of the flash memory in the Rapid Agent Aerosol Detector (RAAD), multiple circuit card electrical components and Developmental Testing (DT) of all new components.

ROSETTA is a modernization effort to provide the General Forces a low-cost, easy to use surface and/or vapor hazard detection ticket for a wide range of chemical warfare agents (CWAs) and non-traditional agents (NTAs). These highly-selective, multiplexed array tickets will enable accurate hazard identification in the presence of common battlefield interferents at the tactical-level. ROSETTA is based on colorimetric technology and will be eye-readable and has potential for integration onto unmanned platforms especially micro-sized unmanned aerial sensors. In addition, the ROSETTA tickets will provide improved hazard detection performance with reduced false alarm rate, potential for increased number of chemicals detected, reduced detection time especially for compounds of interest (CWAs, pharmaceutical based agents (PBAs), NTAs and toxic industrial chemicals (TICs)), and potential for integration onto unmanned platforms especially micro-sized unmanned aerial sensors. ROSETTA funding discontinues after FY23, program deemed un-executable in FY24.

The MOD SEN program conducts technology refresh, modernization and continuous engineering of software applications and information systems to shape and inform the battlespace against CBRN threats for the Analytical Laboratory System Modification (ALS MOD), Common Analytical Laboratory System (CALS) Field Confirmatory Analytical Capability Set (FC ACS), CALS Theater Validation Integrated System (TV IS), CBRN Dismounted Reconnaissance System (DRS), M8, and Enhanced Maritime Biological Detection (EMBD) programs. Continued development and testing of CB sensor equipment is planned to address obsolescence of critical equipment and functionality issues for the Services in order to maintain system interoperability with emerging information technology and decrease size, weight and power requirements to reduce logistical burden of associated capabilities. In FY24, MOD SEN supports the evaluation of components for technical refreshment of the CBRN DRS, CALS, ALS MOD, M8, and EMBD.

The MOD MED program supports improvements to fielded systems and supports post-fielding U.S. Food & Drug Administration (FDA) requirements for CBRN medical devices, including FDA-approved autoinjectors and diagnostic equipment, in order to mitigate obsolescence and maintain fielded capabilities. In FY24, MOD MED will continue annual cyber security updates and management of hardware and software configurations for diagnostic systems; initiate development of a Next Generation Diagnostic System Increment 1 (NGDS 1) replacement system to maintain the current Biological Warfare diagnostics capability, and; support Department of Defense (DoD) sponsored regulatory activities for legacy autoinjectors and continue FDA Post-Marketing Commitments.

SPU RCDD facilitates Joint Special Operations Command (JSOC) rapid response requirements to near-term and emergent chemical-biological defensive capabilities. This includes select elements from across the Special Operations Force (SOF) Enterprise such as CBRN Assessment Response Teams (CARTs) and other Joint Force enabling units such as the 20th Chemical, Biological, Radiological, Nuclear and Explosives Command. SPU RCDD mitigates risk across the Chemical Biological

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Chemical and Biological Defense Program **Date:** March 2023

Appropriation/Budget Activity 0400 / 7	R-1 Program Element (Number/Name) PE 0607384BP / <i>Chemical and Biological Defense (Operational Systems Development)</i>	Project (Number/Name) UN7 / <i>Understand (Op Sys Dev)</i>
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Defense Program (CBDP) by creating a portfolio of operationally-relevant CB capabilities that can be quickly transitioned in response to the articulated, emergent capability needs of the geographic combatant commanders. These objectives are met by the early transitioning of promising science and technologies (S&T); the focused conduct of combat evaluations and mission-oriented operational assessments to assess technological and mission suitability; and the active leveraging of existing Commercial-Off-The-Shelf (COTS) and Government-Off-The-Shelf (GOTS) products along with novel redesign approaches to optimize existing solutions to new challenges supported by “buy-try-decide-acquire” acquisition strategies. SPU RCDD initiates efforts such as respiratory breathing systems, biological identification, unmanned aerial and ground platform sensor integration, development of enhanced and augmented reality systems, and modernization of protective Chemical and Biological ensembles that have gone through requirements validation, and continues product enhancement development and technology upgrades on currently fielded SOF equipment to counter emerging threats.

Weapons of Mass Destruction Civil Support Team (WMD CST) supports the fielded system upgrade and ongoing assessment and acquisition of Commercial Off The Shelf (COTS) and Government Off The Shelf (GOTS) analytical detection, protection, decontamination and sampling equipment for survey in order to expand/enhance the operational capabilities of the WMD CST. Program efforts support upgrades of key components of the WMD CST Program that have become obsolete, or are no longer being supported by the manufacturer. In FY24, the WMD CST program continues system-related test activities, including costs of specially fabricated hardware to obtain or validate engineering data on the performance of the system.

B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2022	FY 2023	FY 2024
<p>Title: 1) MOD CBRN IS</p> <p>Description: CBRN Information Systems Modernization</p> <p>FY 2023 Plans: Perform management, preplanned product improvements and continuous engineering efforts to modernize currently fielded capabilities of the Joint Effects Model (JEM), Joint Warning and Reporting Network (JWARN) and CBRN IS hosted on cloud and Joint Service Command and Control (C2) systems. Update host architectures, operating systems, cyber security requirements and North Atlantic Treaty Organization (NATO) standards in order to maintain interoperability, efficiency and functionality and compliance. Continue Government developmental and operational testing on software updates and modernization efforts. Provide program/financial management, costing, contracting, scheduling and acquisition oversight. Provide product support for software redeployment and training to operational forces.</p> <p>FY 2023 to FY 2024 Increase/Decrease Statement: Program/project funding transferred to another funding line. In FY24, MOD CBRN IS funding will be consolidated under CBRN Support to Command and Control (CSC2).</p>	-	18.995	-
<p>Title: 2) CSC2</p> <p>Description: Continuous engineering, and post-production software support of CSC2 and CBRN information systems</p>	-	-	20.485

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Chemical and Biological Defense Program		Date: March 2023
Appropriation/Budget Activity 0400 / 7	R-1 Program Element (Number/Name) PE 0607384BP / <i>Chemical and Biological Defense (Operational Systems Development)</i>	Project (Number/Name) UN7 / <i>Understand (Op Sys Dev)</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2022	FY 2023	FY 2024
<p><i>FY 2024 Plans:</i> Continue engineering, integration, and delivery of the CSC2 capability set in support of the Minimum Viable Capability Release (MVCR). Continue post-production software support of the Legacy CBRN information systems, until the CSC2 is available to deploy. This continued development will include updates to host architectures, operating systems, cyber security requirements and North Atlantic Treaty Organization (NATO) standards. Supports continuous software developmental and operational testing on software updates and modernization efforts. Provide program/financial management, costing, contracting, scheduling and acquisition oversight and product support for software redeployment and training to operational forces.</p> <p><i>FY 2023 to FY 2024 Increase/Decrease Statement:</i> Program/project funding transferred from another funding line. FY23 funding under MOD CBRN IS. Software acquisition pathway requires regular delivery of capabilities within one year of the execution decision. Provide for continuous engineering of the deployed capabilities.</p>			
<p><i>Title:</i> 3) EMBD <i>Description:</i> Product Development, Test and Evaluation, and Management</p> <p><i>FY 2023 Plans:</i> Continue obsolescence support to include production efforts, testing and verification efforts.</p> <p><i>FY 2023 to FY 2024 Increase/Decrease Statement:</i> Program/project funding transferred to another funding line. FY 24 funding is combined under MOD SEN Project UN7 to execute obsolescence needs.</p>	-	1.748	-
<p><i>Title:</i> 4) ROSETTA <i>Description:</i> Product Development, Engineering Design & Testing</p> <p><i>FY 2023 Plans:</i> Continue contract efforts and conduct contractor testing for down select.</p> <p><i>FY 2023 to FY 2024 Increase/Decrease Statement:</i> Program/project terminated in FY 2024.</p>	-	2.447	-
<p><i>Title:</i> 5) MOD SEN <i>Description:</i> Sensors Modernization</p>	-	6.379	11.666

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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2022	FY 2023	FY 2024
<p><i>FY 2023 Plans:</i> Complete evaluation of improved and integrated sensors and personal protective equipment (PPE) for CBRN Dismounted Reconnaissance System (DRS), identifying new electrochemiluminescence (ECL) technology to refresh CBRN DRS, Common Analytical Laboratory System (CALs) and Analytical Laboratory System (ALS) Modification (MOD). Initiate evaluation of Liquid Chromatography Mass Spectrometry (LCMS) technology and assay development to refresh ALS.</p> <p><i>FY 2024 Plans:</i> Complete evaluation of prototyping efforts associated with the CBRN Dismounted Reconnaissance Systems (DRS) Systems Modernization Program (SMP), and the continued technical refreshment of CBRN DRS, Common Analytical Laboratory System (CALs), Analytical Laboratory System (ALS) Modification (MOD), M8, and Enhanced Maritime Biological Detection (EMBD). Plans include laboratory information systems and gas chromatography mass spectrometer refreshments for CALs, suit refreshment and communications updates for DRS, modernizing the M8 to refresh the technology originally manufactured in the 1960s, and software refreshments and electronics components obsolescence for EMBD.</p> <p><i>FY 2023 to FY 2024 Increase/Decrease Statement:</i> Program/project funding transferred from another funding line. In FY24 MOD SEN combines the MOD SEN funding line with ROSETTA (M8 MWO) and EMBD UN7 lines to execute those activities' specific obsolescence needs.</p>			
<p><i>Title:</i> 6) MOD MED - Diagnostic System Upgrades / Assay Development</p> <p><i>Description:</i> Maintain system hardware and software configurations for fielded diagnostics.</p> <p><i>FY 2023 Plans:</i> Annual cyber security updates and management of hardware and software configurations, and develop additional assays for fielded systems.</p> <p><i>FY 2024 Plans:</i> Continue annual cyber security updates and management of hardware and software configurations, and develop additional assays for NGDS 1.</p> <p><i>FY 2023 to FY 2024 Increase/Decrease Statement:</i> Decrease due to change in program/project schedule. Delay of MPDS Milestone C to FY25.</p>	-	5.354	3.024
<p><i>Title:</i> 7) MOD MED - Autoinjector Post Marketing Commitments and Requirements (PMRs/PMCs)</p> <p><i>Description:</i> Food and Drug Administration (FDA) required Post-Marketing Commitments and Requirements for combination products.</p>	-	0.527	1.906

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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2022	FY 2023	FY 2024
<p>FY 2023 Plans: Office Regulatory Affairs (ORA) Support - regulatory activities for legacy autoinjectors.</p> <p>FY 2024 Plans: Support Army, Office of the Surgeon General (OTSG) - Sponsored regulatory activities for legacy autoinjectors. Initiate FDA Post-Marketing Commitments.</p> <p>FY 2023 to FY 2024 Increase/Decrease Statement: Increase due to change in program/project schedule. Due to the delays to Dual Drug Delivery Device (D4) pushing FDA approval to Dec 2024.</p>			
<p>Title: 8) MOD MED - NGDS 1 Tech Refresh</p> <p>Description: NGDS 1 technology refresh</p> <p>FY 2024 Plans: Initiate developmental activities for system to maintain the Biological Warfare diagnostics capability currently provided by NGDS 1.</p> <p>FY 2023 to FY 2024 Increase/Decrease Statement: New effort within MOD MED.</p>	-	-	8.043
<p>Title: 9) SPU RCDD - System Modernization</p> <p>Description: This line includes Product Development, Test and Evaluation, and Management Services, to modernize technology across multiple commodity areas in order to rapidly field solutions in response to emergent threats.</p> <p>FY 2023 Plans: Initiate product enhancement, development, and technology upgrades on currently fielded equipment to counter emerging threats, conduct limited user evaluations and operational assessments, and provide program management support. Continue the Modular Self Contained Breathing Apparatus (M-SCBA) and Enhanced Warfighter Augmented Training (EWAT) product enhancement, development, and technology upgrades, conduct limited user evaluation, and operational assessments, and provide program management support.</p> <p>FY 2024 Plans: Continue product enhancement, development, and technology upgrades on currently fielded equipment to counter emerging threats, conduct limited user evaluations and operational assessments, and provide program management support. Continue</p>	-	1.463	1.835

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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2022	FY 2023	FY 2024
the MSCBA and EWAT product enhancement, development, and technology upgrades, conduct limited user evaluation, and operational assessments, and provide program management support. FY 2023 to FY 2024 Increase/Decrease Statement: Minor change due to routine program adjustments.			
Title: 10) WMD CST Description: System Upgrade and Support FY 2023 Plans: Continue system-related test activities, including costs of specially fabricated hardware to obtain or validate engineering data on the performance of the system. Continue the detailed planning, conduct, support, data reduction, and reports from such testing, as well as hardware items that are consumed or planned to be consumed in the conduct of such operations. Conduct logistics engineering and integrated logistics support (ILS) management (e.g., maintenance support, facilities, personnel, training, testing, and activation of the system). Initiate start of Phase III unmanned aerial sensors (UAS) testing and larger scale Decon effluent testing. FY 2024 Plans: FY24 funding address capability gaps and obsolescence issues that were identified by the commercial of the shelf (COTS) modification (MOD) process in collaboration with the National Guard Bureau. FY 2023 to FY 2024 Increase/Decrease Statement: Minor change due to routine program adjustments.	-	3.501	3.644
Accomplishments/Planned Programs Subtotals	-	40.414	50.603

C. Other Program Funding Summary (\$ in Millions)											
<u>Line Item</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u> <u>Base</u>	<u>FY 2024</u> <u>OCO</u>	<u>FY 2024</u> <u>Total</u>	<u>FY 2025</u>	<u>FY 2026</u>	<u>FY 2027</u>	<u>FY 2028</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
• CA5: Contamination Avoidance (SDD)	84.967	-	-	-	-	-	-	-	-	0.000	84.967
• CA7: Contamination Avoidance (Op Sys Dev)	12.244	-	-	-	-	-	-	-	-	0.000	12.244
• CM7: Homeland Defense (Op Sys Dev)	1.463	-	-	-	-	-	-	-	-	0.000	1.463

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C. Other Program Funding Summary (\$ in Millions)

Line Item	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
• IP5: <i>Individual Protection (SDD)</i>	18.690	-	-	-	-	-	-	-	-	0.000	18.690
• IP7: <i>Individual Protection (Op Sys Dev)</i>	11.659	-	-	-	-	-	-	-	-	0.000	11.659
• IS7: <i>Information Systems (Op Sys Dev)</i>	14.589	-	-	-	-	-	-	-	-	0.000	14.589
• MB7: <i>Medical Biological Defense (Op Sys Dev)</i>	3.726	-	-	-	-	-	-	-	-	0.000	3.726
• UN5: <i>Understand (SDD)</i>	-	126.071	182.726	-	182.726	137.991	127.671	108.908	68.088	Continuing	Continuing
• JS0005: <i>Common Analytical Laboratory System (CALS)</i>	48.258	30.530	7.167	-	7.167	-	-	-	-	0.000	128.728
• JS5230: <i>Modernization CBRN Information Systems (MOD CBRN IS)</i>	0.611	0.656	-	-	-	-	-	-	-	0.000	1.267
• MC0101: <i>CBRN Dismounted Reconnaissance Systems (CBRN DRS)</i>	21.611	47.324	60.492	-	60.492	64.556	37.802	23.292	-	Continuing	Continuing
• PHM018: <i>SPU Rapid Capability Development And Demo (SPU RCDD)</i>	10.834	9.914	49.455	-	49.455	20.689	20.180	24.216	26.638	Continuing	Continuing

Remarks

D. Acquisition Strategy

MODERNIZATION CBRN INFORMATION SYSTEMS (MOD CBRN IS)

MOD CBRN IS funding will be consolidated under CBRN Support to Command and Control (CSC2) starting in FY24 to gain program management efficiencies and to adequately sustain Joint Effects Model (JEM) and Joint Warning and Reporting Network (JWARN) capabilities until a CSC2 capability is available.

CBRN SUPPORT TO C2 (CSC2)

Effort combines the MOD CBRN IS effort with CSC2. The acquisition strategy utilizes a managed portfolio approach to align multiple capabilities in support of continuous engineering and modernization of CBRN Information Systems. This encompasses the continuous engineering to maintain, modernize, and conduct post production and

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deployment support to fielded CBRN software information systems and capabilities. CSC2 will leverage and modernize the existing capabilities formally under the MOD CBRN IS effort to reduce cost and technical risk through the existing infrastructure and software platforms for integration and delivery of the modular capability set. As well as initiate the sun setting of the legacy capabilities associated with MOD CBRN IS.

ENHANCED MARITIME BIOLOGICAL DETECTION (EMBD)

The EMBD program uses a streamlined acquisition strategy utilizing a Full Rate Production (FRP) contract with options for production of EMBD kits and Obsolescence Support in Production (OSIP) to resolve diminishing sources and obsolescence issues. The FY24 OSIP Option will address major obsolescence problems identified by the prime contractor that could affect a stable production line and to ensure new EMBD hardware/software remains procurable, field upgradeable and backwards compatible with previously fielded units. The FY24 OSIP Option will undertake engineering efforts to resolve obsolescence of the flash memory in the Rapid Agent Aerosol Detector (RAAD), multiple circuit card electrical components and Developmental Testing (DT) of all new components.

REACTIVE CHEMISTRY ORTHOGONAL SURFACE AND ENVIRONMENTAL THREAT TICKET ARRAY (ROSETTA)

ROSETTA will use a streamlined approach to rapidly field multiple components of the modernization of the M256A2 kit. This approach is based on technology that will transition from Science and Technology Efforts and/or commercial off the shelf (COTS) products to the M256 kit. These efforts will utilize multiple contract vehicles including Countering Weapons of Mass Destruction (CWMD) Other Transactional Authority (OTA) and Joint Enterprise- Research, Development, Acquisition, Production/Procurement (JERDAP) in order to streamline the acquisition of the products. The ROSETTA funding will complete the acquisition of the M8 component to the M256 kit and will support the acquisition of a pharmaceutical based agent (PBA) ticket, the M256 vapor unmasking tool, and the other non-traditional agents (NTAs) and toxic industrial chemicals (TICs). These products will be transitioned to TACOM for production.

MODERNIZATION SENSORS (MOD SEN)

MOD SEN program uses a Commercial Off-The-Shelf (COTS)/Government Off-The-Shelf (GOTS) approach to manage modernization for multiple CBRN sensor programs. This strategy employs a Non-developmental Item acquisition concept to translate mission needs and emerging technology capabilities into a fieldable component to solve obsolescence and technology update needs. Current planned funding supports CALS TV-IS, FC-ACS, ALS MOD, CBRN DRS, M8 Modification, and EMBD modernization activities. The program maintains baseline capabilities with obsolescence management, technology insertions, and enhancements based on changes in requirements. This program modernizes the Joint Force to combat advancing threats and current capability gaps in analytical laboratory and sensitive site assessment and exploitation capabilities require a system modernization strategy for each system.

MODERNIZATION MEDICAL (MOD MED)

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MOD MED leverages an existing Indefinite Delivery/Indefinite Quantity (IDIQ) Delivery Order contract with the Next Generation Diagnostic System Increment 1 (NGDS 1) original equipment manufacturer for both hardware and software updates, including cybersecurity, as well as for development of additional assays (i.e. tests) to address emerging biological threats and diseases.

MOD MED will mitigate obsolescence of the NGDS 1, by awarding contracts and/or Other Transaction Authority (OTA) agreements to develop, test and evaluate a replacement for the current commercial system, and maintain the existing Biological Warfare diagnostic capability. MOD MED for AUTOINJ will ensure post-marketing commitments and requirements are anticipated as a result of the U.S. Food & Drug Administration (FDA) approval, and will be the responsibility of the performer and the government. AUTOINJ uses contracts and Other Transaction Authority (OTA) agreements in which the performer shall be responsible for conducting post-approval FDA requirements.

SPU RAPID CAPABILITY DEVELOPMENT AND DEPLOYMENT (SPU RCDD)

The SPU RCDD overall acquisition strategy allows for rapid prototyping and testing of novel and modified COTS or GOTS systems against mission critical capabilities to enhance mission success. The SPU RCDD will use technical and functional evaluations of currently fielded items to identify materiel that requires modernization and incorporate operationally-relevant system developments. This will be accomplished through competitive contracting vehicles such as Multiple Award Indefinite Delivery Indefinite Quantify Task Order and the Countering Weapons of Mass Destruction Other Transaction Authority (CWMD OTA) for the development of prototype test assets. The SPU RCDD will use Government Agencies for prototype development, test and evaluation, and technical support.

WMD - CIVIL SUPPORT TEAMS (WMD CST)

The Weapons of Mass Destruction Civil Support Team Program (WMD-CST) is a COTS based program that supports the evaluation of advancements in CBRN commercial off the shelf (COTS)/government-off-the-shelf (GOTS) equipment against the current technology baseline of equipment fielded to the (57) WMD CST Teams, this is to address analytical equipment obsolescence.

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Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
MOD CBRN IS - SW S - Modernization	Various	Various : N/A	-	0.000		13.118	Dec 2022	0.000		-		0.000	0.000	13.118	0.000
CSC2 - Continuous Engineering CBRN-IS	TBD	Various : N/A	-	0.000		0.000		11.681	Dec 2023	-		11.681	Continuing	Continuing	0.000
CSC2 - Modernization CBRN Warning & Reporting	C/CPIF	Various : N/A	-	0.000		0.000		2.137	Jan 2024	-		2.137	Continuing	Continuing	0.000
EMBD - HW SB - Obsolescence Support in Production	C/CPIF	Various : N/A	-	0.000		1.059	Dec 2022	0.000		-		0.000	0.000	1.059	0.000
ROSETTA - HW C - Program and OGA Support	MIPR	Various : N/A	-	0.000		2.203	Apr 2023	0.000		-		0.000	0.000	2.203	0.000
MOD SEN - HW C - Government Team Labor	MIPR	U.S. Army Combat Capabilities Development Command (DEVCOM) Chemical Biological Center (CBC) : Aberdeen Proving Ground, MD	-	0.000		0.345	Nov 2022	0.992	Nov 2023	-		0.992	Continuing	Continuing	0.000
MOD MED - HW C - Product Management	Various	Various : N/A	-	0.000		1.756	Dec 2022	3.520	Dec 2023	-		3.520	Continuing	Continuing	0.000
MOD MED - HW C - Autoinjector ORA	MIPR	U.S. Army Medical Research and Development Command (USAMRDC) : Fort Detrick, MD	-	0.000		0.193	Nov 2022	0.794	Nov 2023	-		0.794	Continuing	Continuing	0.000
MOD MED - HW C - Autoinjector PMR/PMCs	C/CPFF	Kaleo : Richmond, VA	-	0.000		0.334	Sep 2023	0.000		-		0.000	0.000	0.334	0.000
MOD MED - HW C - Next Generation Diagnostic System 1 (NGDS 1)	C/CPFF	BioFire Dx : Salt Lake City, UT	-	0.000		3.029	Feb 2023	2.160	Dec 2023	-		2.160	Continuing	Continuing	0.000

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Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
MOD MED - HW C - NGDS 1 Tech Refresh	C/CFFF	TBD : N/A	-	0.000		0.000		4.792	Mar 2024	-		4.792	Continuing	Continuing	0.000
SPU RCDD - HW C - Prototype development	Various	Various : N/A	-	0.000		1.253	Dec 2022	1.613	Dec 2023	-		1.613	Continuing	Continuing	0.000
WMD CST - HW S - Team Labor	Various	Various : N/A	-	0.000		0.000		0.853	Nov 2023	-		0.853	Continuing	Continuing	0.000
Subtotal			-	0.000		23.290		28.542		-		28.542	Continuing	Continuing	N/A

Support (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
MOD CBRN IS - ES S - milCloud	MIPR	Various : N/A	-	0.000		2.477	Dec 2022	0.000		-		0.000	0.000	2.477	0.000
CSC2 - CBRN-IS Platform Maintenance	MIPR	Various : N/A	-	0.000		0.000		3.763	Jan 2024	-		3.763	Continuing	Continuing	0.000
EMBD - ES S - Software Support	C/CPIF	Various : N/A	-	0.000		0.054	Dec 2022	0.000		-		0.000	0.000	0.054	0.000
MOD SEN - ES C - Science and Engineering Support	MIPR	U.S. Army Combat Capabilities Development Command (DEVCOM) Chemical Biological Center (CBC) : Aberdeen Proving Ground, MD	-	0.000		0.170	Nov 2022	0.000		-		0.000	0.000	0.170	0.000
MOD SEN - ES C - Obsolescent Management	Various	Various : N/A	-	0.000		0.784	Nov 2022	3.408	Nov 2023	-		3.408	Continuing	Continuing	0.000
WMD CST - ES C - Science & Engineering Support	MIPR	Naval Air Warfare Center (Aircraft Division) : Patuxent River, MD	-	0.000		0.120	Jan 2023	0.190	Nov 2023	-		0.190	Continuing	Continuing	0.000

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Support (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
WMD CST - ES C - Government Product Development Team Labor	MIPR	U.S. Army Combat Capabilities Development Command (DEVCOM) Chemical Biological Center (CBC) : Aberdeen Proving Ground, MD	-	0.000		0.384	Feb 2023	0.190	Nov 2023	-		0.190	Continuing	Continuing	0.000
Subtotal			-	0.000		3.989		7.551		-		7.551	Continuing	Continuing	N/A

Test and Evaluation (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
MOD CBRN IS - OTH S - System Testing	MIPR	Various : N/A	-	0.000		1.500	Dec 2022	0.000		-		0.000	0.000	1.500	0.000
CSC2 - System update T&E	TBD	U.S. Navy Space and Naval Warfare (SPAWAR) Systems Center : San Diego, CA	-	0.000		0.000		0.952	Oct 2023	-		0.952	Continuing	Continuing	0.000
EMBD - Obsolescence Support in Production testing and verification	C/CPIF	Various : N/A	-	0.000		0.401	Dec 2022	0.000		-		0.000	0.000	0.401	0.000
MOD SEN - DTE C - Component Test and Evaluation	MIPR	U.S. Army Combat Capabilities Development Command (DEVCOM) Chemical Biological Center (CBC) : Aberdeen Proving Ground, MD	-	0.000		0.959	Nov 2022	0.750	Nov 2023	-		0.750	Continuing	Continuing	0.000

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Test and Evaluation (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
MOD SEN - DTE C - Information Assurance	Various	Various : N/A	-	0.000		0.247	Nov 2022	0.000		-		0.000	0.000	0.247	0.000
MOD SEN - DTE C - System Modernization	Various	Various : N/A	-	0.000		3.274	Nov 2022	4.953	Nov 2023	-		4.953	Continuing	Continuing	0.000
WMD CST - OTHC C - CBRN COTS Component	MIPR	U.S. Army Combat Capabilities Development Command (DEVCOM) Chemical Biological Center (CBC) : Aberdeen Proving Ground, MD	-	0.000		1.120	Feb 2023	1.680	Nov 2023	-		1.680	Continuing	Continuing	0.000
WMD CST - OTHC C - CBRN COTS Component	MIPR	Naval Air Warfare Center (Aircraft Division) : Patuxent River, MD	-	0.000		1.574	Jan 2023	0.367	Nov 2023	-		0.367	Continuing	Continuing	0.000
Subtotal			-	0.000		9.075		8.702		-		8.702	Continuing	Continuing	N/A

Management Services (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
MOD CBRN IS - PM/MS S - Program Management Support	Various	Various : N/A	-	0.000		1.900	Dec 2022	0.000		-		0.000	0.000	1.900	0.000
CSC2 - Program Management Office Support	Various	Various : N/A	-	0.000		0.000		1.952	Oct 2023	-		1.952	Continuing	Continuing	0.000
EMBD - PM/MS S - Program Management Support	MIPR	Various : N/A	-	0.000		0.234	Dec 2022	0.000		-		0.000	0.000	0.234	0.000

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Chemical and Biological Defense Program **Date:** March 2023

Appropriation/Budget Activity 0400 / 7	R-1 Program Element (Number/Name) PE 0607384BP / Chemical and Biological Defense (Operational Systems Development)	Project (Number/Name) UN7 / Understand (Op Sys Dev)
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Management Services (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
ROSETTA - PM/MS S - Program Management Support	MIPR	Various : N/A	-	0.000		0.244	Jan 2023	0.000		-		0.000	0.000	0.244	0.000
MOD SEN - PM/MS C - Program Management Cost	Various	Various : N/A	-	0.000		0.000		1.563	Nov 2023	-		1.563	Continuing	Continuing	0.000
MOD SEN - PM/MS S - Program Management Support	Various	Various : N/A	-	0.000		0.600	Jan 2023	0.000		-		0.000	0.000	0.600	0.000
MOD MED - PM/MS C - Management Services	Various	Various : N/A	-	0.000		0.569	Dec 2022	1.707	Dec 2023	-		1.707	Continuing	Continuing	0.000
SPU RCDD - PM/MS C - Program Management Support	Various	Various : N/A	-	0.000		0.210	Dec 2022	0.222	Dec 2023	-		0.222	Continuing	Continuing	0.000
WMD CST - PM/MS S - Program Management Support	MIPR	Various : N/A	-	0.000		0.303	Dec 2022	0.364	Nov 2023	-		0.364	Continuing	Continuing	0.000
Subtotal			-	0.000		4.060		5.808		-		5.808	Continuing	Continuing	N/A

	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	0.000	40.414	50.603	-	50.603	Continuing	Continuing	N/A

Remarks

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Chemical and Biological Defense Program		Date: March 2023
Appropriation/Budget Activity 0400 / 7	R-1 Program Element (Number/Name) PE 0607384BP / <i>Chemical and Biological Defense (Operational Systems Development)</i>	Project (Number/Name) UN7 / <i>Understand (Op Sys Dev)</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
MOD CBRN IS - Modernization	1	2022	4	2023
MOD CBRN IS - Continuous Engineering/SW Codes Updates	1	2022	4	2023
MOD CBRN IS - Cyber Security Compliance	1	2022	4	2023
MOD CBRN IS - Operating system architecture updates	1	2022	4	2023
MOD CBRN IS - Configuration Management and Test and Evaluation	1	2022	4	2023
MOD CBRN IS - Validation, Verification and Accreditation	1	2022	4	2023
CSC2 - SWP Execution Phase Decision	2	2023	2	2023
CSC2 - Continuous Software DT/OT	3	2023	4	2028
CSC2 - MVP (CDP-1)	4	2023	4	2023
CSC2 - Service Common Operating Environment Integration	1	2024	4	2028
CSC2 - Cyber Security Compliance	1	2024	4	2028
CSC2 - CD-Capability Drop - MVCR Delivery 1 (CDP-1)	4	2024	4	2025
CSC2 - MVP (CDP-2)	4	2024	4	2024
CSC2 - Continuous Engineering & Software Updates	1	2025	4	2028
CSC2 - Operating System Architecture Updates	1	2025	4	2028
CSC2 - CD-Capability Drop - MVCR Delivery 2 (CDP-2)	4	2025	4	2026
CSC2 - Future MVPs	2	2026	4	2028
CSC2 - CD-Capability Drop - Future MVCR Deliveries	4	2026	4	2028
EMBD - IOC-Initial Operational Capability	2	2023	2	2023
EMBD - FRP Production	1	2022	3	2027
EMBD - FOC-Full Operational Capability	4	2028	4	2028

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Chemical and Biological Defense Program **Date:** March 2023

Appropriation/Budget Activity 0400 / 7	R-1 Program Element (Number/Name) PE 0607384BP / <i>Chemical and Biological Defense (Operational Systems Development)</i>	Project (Number/Name) UN7 / <i>Understand (Op Sys Dev)</i>
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Events	Start		End	
	Quarter	Year	Quarter	Year
ROSETTA - Testing & Demonstrations (M8)	1	2022	2	2022
ROSETTA - Engineering Design	4	2022	2	2023
ROSETTA - OTA Contract Award	3	2022	4	2027
MOD SEN - DT/OT for refreshed components and obsolescence management within MOD SEN	1	2023	4	2028
MOD MED - Diagnostic System Upgrades / Assay Development	1	2023	4	2028
MOD MED - NGDS 1 Tech Refresh	4	2023	4	2028
MOD MED - Autoinjector Post Marketing Commitments and Requirements (PMRs/ PMCs)	1	2023	4	2028
SPU RCDD - Modernize CBRN Materiel	1	2022	4	2027
SPU RCDD - Develop Modular Self Contained Breathing Apparatus (MSCBA)	1	2022	4	2024
SPU RCDD - Develop Enhanced Warfighter Augmented Training (EWAT)	1	2022	4	2024
SPU RCDD - Prototype Novel CBRN Equipment	1	2022	4	2027
SPU RCDD - Develop Low Temperature Plasma Mass Spectrometer (LTPMS)	1	2022	4	2024
SPU RCDD - Develop Optimized CBRN Hydration System (OCHS)	1	2022	2	2023
SPU RCDD - Develop Assault Respirator	1	2022	4	2023
SPU RCDD - Develop USSOCOM-specific UGV/UAS Sensor Integration	1	2022	4	2023
WMD CST - Upgrade Fielded Systems	1	2022	4	2027

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Chemical and Biological Defense Program **Date:** March 2023

Appropriation/Budget Activity 0400 / 7	R-1 Program Element (Number/Name) PE 0607384BP / <i>Chemical and Biological Defense (Operational Systems Development)</i>	Project (Number/Name) PT7 / <i>Protect (Op Sys Dev)</i>
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COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
PT7: <i>Protect (Op Sys Dev)</i>	-	0.000	20.076	26.818	0.000	26.818	22.815	15.490	14.193	13.612	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Protect Operational System Development Project provides the Joint Force the continued readiness of fielded collective and individual protective capabilities and provides size, weight and power improvements to reduce logistical burden on the Warfighter and Services. In FY 2023, the Chemical Biological Defense Program (CBDP) RDT&E Projects were restructured to align with the CBDP portfolio construct. PT7 efforts in FY 2022 remain in Projects C07 and IP7. This restructuring provided standardization and alignment across CBDP research, development and acquisition efforts.

Efforts included in this Project are:

- (1) Modernization Protection Collective Protection (MODPROT CP), and
- (2) Modernization Protection Individual Protection (MODPROT IP)

Modernization Protection Collective Protection (MODPROT CP) addresses modernization and obsolescence across the DoD CP portfolio to increase readiness, sustainability, reliability, and affordability of these systems. The obsolescence of critical equipment, if not modernized, will continue to face significantly increased cost and long lead times making the equipment unaffordable and unprocurable to meet major weapon system program's requirements and schedules. MODPROT CP modernizes decades old collective protection equipment reducing costs, shortening lead times, and updating key components to extend service life and ensure affordable and procurable to warfighters. In FY24, MODPROT CP will continue M48A1 Filter Redesign, Collective Protection Modernization for Ships and Buildings, and begin shipboard system installation. Additionally, the program will continue Mobile Platform Filter Modernization to reduce logistics costs and continue conducting collective protection system filter surveillance testing to improve system sustainment.

Modernization Protection Individual Protection (MODPROT IP) addresses obsolescence issues with Individual Protective (IP) equipment and the need to modernize fielded IP with capabilities to meet or exceed the Services requirements. MODPROT IP will also conduct modernization efforts and reverse engineering of maintenance and repair procedures for the Joint Services Mask Leakage Tester (JSMLT). MODPROT IP will also provide mask and filter system upgrades and modernization of fielded protection systems to enhance respiratory and ocular protection resulting in an increased lethality of fighter aircraft by mitigating risk due to operationally unsuitable aircrew Chemical Biological Radiological Nuclear (CBRN) masks. Modernization efforts will include technical manual updates and a Logistics Demonstration for an updated, lightweight version of the Joint Protective Aircrew Ensemble (JPACE). Testing and analysis with aircraft will fully validate and refine new Tactics, Techniques and Procedures (TTPs) that allow aircrews to operate without restrictive CBRN protective equipment by determining time and techniques required to reduce cockpit hazards to acceptable levels by flushing with clean air. The impact of funding these programs will address modernization and obsolescence across the DoD IP portfolio to increase readiness, sustainability, reliability, and affordability of these systems. In FY24, MODPROT IP will continue modernization of the Joint Mask Leakage Tester (JSMLT), continue Fixed Wing Aircraft/Aircrew Personal Protective Equipment (PPE) optimization effort for multiple airframes, finalize Second

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Chemical and Biological Defense Program **Date:** March 2023

Appropriation/Budget Activity 0400 / 7	R-1 Program Element (Number/Name) PE 0607384BP / <i>Chemical and Biological Defense (Operational Systems Development)</i>	Project (Number/Name) PT7 / <i>Protect (Op Sys Dev)</i>
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Generation Filter Engineering Change Proposal (ECP), initiate performance characterization for whole life of Individual Protective Equipment (IPE) products, initiate Chemical Biological Incident Response Force (CBIRF) Class 3 Modernization, and initiate Chemical Biological Radiological and Nuclear Response Enterprise Personal Protective Equipment (CRE PPE) Unit Modernization. FY24 increase of \$3M for Personal Protective Equipment (PPE) Modernization efforts.

B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2022	FY 2023	FY 2024
<p>Title: 1) MODPROT CP</p> <p>Description: Upgrades, improvements, and modernizations to fielded collective protection (CP) systems</p> <p>FY 2023 Plans: Continue redesign of M49 gas filters. Continue M48A1 Filter Redesign. Continue Collective Protection Modernization for Ships and Buildings and complete system lab testing and system design packages for platform installation. Continue conducting collective protection system filter surveillance testing to improve system sustainment.</p> <p>FY 2024 Plans: Continue M48A1 Filter Redesign. Continue Collective Protection (CP) Modernization for Ships and Buildings and begin shipboard system installation. Continue Mobile Platform Filter Modernization to reduce logistics costs. Continue conducting CP system filter surveillance testing to improve system sustainment.</p> <p>FY 2023 to FY 2024 Increase/Decrease Statement: Increase due to fact of life change in the program/project. The increase to MODPROT CP is related to the high costs expected from the Shipboard ColPro Modernization project's effort to install prototype hardware on a test ship for evaluation.</p>	-	10.088	13.468
<p>Title: 2) MODPROT IP</p> <p>Description: Upgrades, improvements, and modernizations to fielded individual protection (IP) systems</p> <p>FY 2023 Plans: Continue modernization of the Joint Mask Leakage Tester (JSMLT). Continue Fixed Wing Aircraft/Aircrew PPE optimization effort for multiple airframes. Finalize Second Generation Filter Engineering Change Proposal (ECP). Initiate Third Generation Filter Prototype Developmental Testing (DT).</p> <p>FY 2024 Plans: Continue modernization of the Joint Mask Leakage Tester (JSMLT). Continue Fixed Wing Aircraft/Aircrew Personal Protective Equipment (PPE) optimization effort for multiple airframes. Finalize Second Generation Filter Engineering Change Proposal (ECP). Initiate performance characterization for whole life of Individual Protective Equipment (IPE) products. Initiate Chemical</p>	-	9.988	13.350

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Chemical and Biological Defense Program **Date:** March 2023

Appropriation/Budget Activity 0400 / 7	R-1 Program Element (Number/Name) PE 0607384BP / <i>Chemical and Biological Defense (Operational Systems Development)</i>	Project (Number/Name) PT7 / <i>Protect (Op Sys Dev)</i>
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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2022	FY 2023	FY 2024
Biological Incident Response Force (CBIRF) Class 3 Modernization. Initiate Chemical Biological Radiological and Nuclear Response Enterprise Personal Protective Equipment (CRE PPE) Unit Modernization.			
<i>FY 2023 to FY 2024 Increase/Decrease Statement:</i> Increase due to change in program/project technical parameters. FY24 increase of \$3M for Personal Protective Equipment Modernization efforts.			
Accomplishments/Planned Programs Subtotals	-	20.076	26.818

C. Other Program Funding Summary (\$ in Millions)											
Line Item	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
• IP7: Individual Protection (Op Sys Dev)	11.659	-	-	-	-	-	-	-	-	0.000	11.659
• PHM036: Modernization Protection Collective Protection (MODPROT CP)	1.385	1.385	-	-	-	-	-	1.375	2.517	Continuing	Continuing

Remarks

D. Acquisition Strategy
 MODERNIZATION PROTECTION COLLECTIVE PROTECTION (MODPROT CP)
 Modernization Protection Collective Protection (MODPROT CP) leverages mature technology from contractor developed components to address and replace obsolete components of various fielded collective protection systems. Modernization efforts will also use items developed by the Government that have transitioned from lower to higher technology readiness levels that can be inserted into fielded systems. A combination of competitive and sole source contracts to various industry vendors and project orders to various Government activities will be used to adapt previously developed components to modernize systems. Robust component and system level testing to meet applicable military standards will validate both Government and contractor furnished improvements. The improvements will be added into the specific systems' updated Technical Data Packages (TDPs) to be used in Engineering Change Proposals (ECPs) and provided to the item managers.

MODERNIZATION PROTECTION INDIVIDUAL PROTECTION (MODPROT IP)
 Modernization Protection Individual Protection (MODPROT IP) leverages mature technology from contractor developed components to address and replace obsolete components of various fielded individual protection systems. Modernization efforts will also use items developed by the Government that have transitioned from lower to higher technology readiness levels that can be inserted into fielded systems. A combination of competitive and sole source contracts to various industry vendors and

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Chemical and Biological Defense Program		Date: March 2023
Appropriation/Budget Activity 0400 / 7	R-1 Program Element (Number/Name) PE 0607384BP / <i>Chemical and Biological Defense (Operational Systems Development)</i>	Project (Number/Name) PT7 / <i>Protect (Op Sys Dev)</i>

project orders to various Government activities will be used to adapt previously developed components to modernize systems. Robust component and system level testing will validate both Government and contractor furnished improvements. The improvements will be added into the specific system's updated TDP to be used in ECPs and provided to the item managers.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Chemical and Biological Defense Program **Date:** March 2023

Appropriation/Budget Activity 0400 / 7	R-1 Program Element (Number/Name) PE 0607384BP / <i>Chemical and Biological Defense (Operational Systems Development)</i>	Project (Number/Name) PT7 / <i>Protect (Op Sys Dev)</i>
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Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
MODPROT CP - HW C - Collective Protection Modernization for Ships	Various	Various : N/A	-	0.000		6.604	Nov 2022	8.604	Nov 2023	-		8.604	Continuing	Continuing	0.000
MODPROT CP - HW C - Filter Redesign & Modernization, Filter Life Extension Residual Life Indicator (RLI)	MIPR	Various : N/A	-	0.000		0.721	Nov 2022	1.167	Nov 2023	-		1.167	Continuing	Continuing	0.000
MODPROT IP - HW C - Filter Prototypes, JSMLT Modernization, and CBIRF & CRE Modernization	Various	Various : N/A	-	0.000		3.732	Dec 2022	4.576	Nov 2023	-		4.576	Continuing	Continuing	0.000
Subtotal			-	0.000		11.057		14.347		-		14.347	Continuing	Continuing	N/A

Support (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
MODPROT CP - ES C - IPT, Technical, Engineering and Logistics Support	MIPR	Various : N/A	-	0.000		0.549	Nov 2022	1.652	Nov 2023	-		1.652	Continuing	Continuing	0.000
MODPROT IP - ES C - IPT, Engineering, Technical, Logistics Support	MIPR	Various : N/A	-	0.000		0.545	Dec 2022	1.318	Nov 2023	-		1.318	Continuing	Continuing	0.000
Subtotal			-	0.000		1.094		2.970		-		2.970	Continuing	Continuing	N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Chemical and Biological Defense Program **Date:** March 2023

Appropriation/Budget Activity 0400 / 7	R-1 Program Element (Number/Name) PE 0607384BP / <i>Chemical and Biological Defense (Operational Systems Development)</i>	Project (Number/Name) PT7 / <i>Protect (Op Sys Dev)</i>
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Test and Evaluation (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
MODPROT CP - DTE C - CP Modernization Testing	Various	Various : N/A	-	0.000		1.465	Oct 2022	1.219	Nov 2023	-		1.219	Continuing	Continuing	0.000
MODPROT IP - DTE C - Fixed Wing Aircraft/Aircrew PPE Optimization Effort	MIPR	Various : N/A	-	0.000		3.200	Dec 2022	3.497	Nov 2023	-		3.497	Continuing	Continuing	0.000
MODPROT IP - DTE C - Filter Prototype Testing	MIPR	U.S. Army Combat Capabilities Development Command (DEVCOM) Chemical Biological Center (CBC) : Aberdeen Proving Ground, MD	-	0.000		1.770	Dec 2022	3.141	Nov 2023	-		3.141	Continuing	Continuing	0.000
Subtotal			-	0.000		6.435		7.857		-		7.857	Continuing	Continuing	N/A

Management Services (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
MODPROT CP - PM/MS C - Program Management Support	MIPR	Various : N/A	-	0.000		0.749	Nov 2022	0.826	Nov 2023	-		0.826	Continuing	Continuing	0.000
MODPROT IP - PM/MS C - Program Management Support	MIPR	Various : N/A	-	0.000		0.741	Dec 2022	0.818	Nov 2023	-		0.818	Continuing	Continuing	0.000
Subtotal			-	0.000		1.490		1.644		-		1.644	Continuing	Continuing	N/A

	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract		
Project Cost Totals		-	0.000	20.076	26.818	-		26.818	Continuing	Continuing	N/A

Remarks

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Exhibit R-4, RDT&E Schedule Profile: PB 2024 Chemical and Biological Defense Program		Date: March 2023
Appropriation/Budget Activity 0400 / 7	R-1 Program Element (Number/Name) PE 0607384BP / <i>Chemical and Biological Defense (Operational Systems Development)</i>	Project (Number/Name) PT7 / <i>Protect (Op Sys Dev)</i>

	FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027				FY 2028			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
MODPROT CP - M93 GPFU Electro Magnetic Interference	██████████																											
MODPROT CP - Non Destructive (ND) Acceptance Leak Test CP Filters	██████████																											
MODPROT CP - Environmental M98 Guard Bed Testing	██████████																											
MODPROT CP - M49 Filter Modernization	██████████																											
MODPROT CP - Filter Prototype Design Analysis and Development	██████████																											
MODPROT CP - Collective Protection Training Development	██████████																											
MODPROT CP - M48A1 Filter Redesign	██████████				██████████				██████████				██████████				██████████				██████████							
MODPROT CP - Collective Protection Modernization for Ships and Buildings	██████████				██████████				██████████				██████████				██████████				██████████							
MODPROT CP - M14 Protective Entrance Modernization	██████████																											
MODPROT CP - Filter Prototype Laboratory Testing and Evaluation					██████████																							
MODPROT CP - Contaminated Filter Changeout Procedures					██████████																							
MODPROT CP - Filter Technical Design Package and Procurement of Filter Design Test Articles					██████████																							
MODPROT CP - Platform Interoperability Testing and Final Technical Design Package									██████████																			
MODPROT CP - Mobile Platform Filter Modernization													██████████															

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Chemical and Biological Defense Program		Date: March 2023
Appropriation/Budget Activity 0400 / 7	R-1 Program Element (Number/Name) PE 0607384BP / <i>Chemical and Biological Defense (Operational Systems Development)</i>	Project (Number/Name) PT7 / <i>Protect (Op Sys Dev)</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
MODPROT CP - M93 GPFU Electro Magnetic Interference	1	2022	4	2022
MODPROT CP - Non Destructive (ND) Acceptance Leak Test CP Filters	1	2022	4	2022
MODPROT CP - Environmental M98 Guard Bed Testing	1	2022	4	2022
MODPROT CP - M49 Filter Modernization	1	2022	4	2022
MODPROT CP - Filter Prototype Design Analysis and Development	1	2022	4	2022
MODPROT CP - Collective Protection Training Development	1	2022	4	2022
MODPROT CP - M48A1 Filter Redesign	1	2022	4	2025
MODPROT CP - Collective Protection Modernization for Ships and Buildings	1	2022	4	2026
MODPROT CP - M14 Protective Entrance Modernization	1	2022	4	2022
MODPROT CP - Filter Prototype Laboratory Testing and Evaluation	1	2023	2	2023
MODPROT CP - Contaminated Filter Changeout Procedures	3	2022	4	2023
MODPROT CP - Filter Technical Design Package and Procurement of Filter Design Test Articles	1	2023	4	2023
MODPROT CP - Platform Interoperability Testing and Final Technical Design Package	1	2024	4	2024
MODPROT CP - Mobile Platform Filter Modernization	1	2025	4	2025
MODPROT CP - Filter Surveillance Testing	1	2025	4	2028
MODPROT IP - Second Generation Filter & NIOSH DT	1	2022	4	2022
MODPROT IP - JSMLT Modernization	1	2022	4	2026
MODPROT IP - LJPACE TM Updates & LOGDEMO	1	2022	4	2022
MODPROT IP - MALO Shelf Life Extension Testing	1	2022	2	2022
MODPROT IP - Fixed Wing Aircraft/Aircrew PPE Optimization Effort	1	2023	4	2026
MODPROT IP - Maximum Age Study for JB2GU nFR Glove	2	2022	4	2022

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Chemical and Biological Defense Program **Date:** March 2023

Appropriation/Budget Activity 0400 / 7	R-1 Program Element (Number/Name) PE 0607384BP / <i>Chemical and Biological Defense (Operational Systems Development)</i>	Project (Number/Name) PT7 / <i>Protect (Op Sys Dev)</i>
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Events	Start		End	
	Quarter	Year	Quarter	Year
MODPROT IP - Second Generation Filter ECP	1	2023	2	2023
MODPROT IP - CBIRF Class 3 Modernization	2	2024	4	2024
MODPROT IP - CRE PPE Modernization	2	2024	4	2024
MODPROT IP - Third Generation Filter Prototype DT	1	2025	4	2025
MODPROT IP - Third Generation Filter Technology ECP	1	2026	2	2026

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Chemical and Biological Defense Program										Date: March 2023		
Appropriation/Budget Activity 0400 / 7					R-1 Program Element (Number/Name) PE 0607384BP / <i>Chemical and Biological Defense (Operational Systems Development)</i>					Project (Number/Name) MT7 / <i>Mitigate (Op Sys Dev)</i>		
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
MT7: <i>Mitigate (Op Sys Dev)</i>	-	0.000	5.098	3.074	0.000	3.074	1.987	1.819	1.845	1.862	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Mitigate Operational System Development Project provides the Joint Force continued readiness of fielded personnel and materiel contamination mitigation and chemical agent therapeutic capabilities and provides size, weight and power improvements to reduce logistical burden on the Warfighter. In FY 2023, the Chemical Biological Defense Program (CBDP) RDT&E Projects were restructured to align with the CBDP portfolio construct. MT7 efforts in FY 2022 remain in Projects MC7 and DE7. This restructuring provided standardization and alignment across CBDP research, development and acquisition efforts.

Efforts included in this Project are:

- (1) Improved Nerve Agent Treatment System Centrally Acting (INATS CA), and
- (2) Modernization Protection Decontamination (MODPROT DE)

INATS CA includes modernization of Soman Nerve Agent Pretreatment Pyridostigmine (SNAPP; pyridostigmine bromide [PB] tablets). In FY24, INATS CA continues studies on the Food and Drug Administration (FDA)-approved SNAPP, a medical pretreatment against nerve agent poisoning to upgrade its joint service utility and ensure its continued safety and efficacy. Also in FY24, the INATS CA program will submit to the FDA for approval, documents supporting sustained release PB tablets in blister packs. These tablets will provide a single tablet per day dose alternative to the current SNAPP dosing regimen for the pretreatment against soman nerve agent poisoning.

Modernization Protection Decontamination (MODPROT DE) addresses modernization and obsolescence across the DoD DE portfolio to increase readiness, sustainability, reliability, and affordability of these systems. Beginning with the obsolescence and technical data concerns, beginning with the M26 Joint Services Transportable Decontamination System-Small Scale (JSTDS-SS) through validation and verification of Technical Manual (TM) changes as well as technical data for spare and repair parts; the M12A1 Power Driven Decontamination Apparatus (PDDA) by updating technical references and performing the necessary validation and verification before publishing an updated TM. In FY24, MODPROT DE will complete the M12 Pressure Accumulator Project, continue M26 modernization efforts to extend service life and sustainment support to include Technical Manual updates with verification and validation, and initiate and complete the M295 and M100 Performance Characterization Project.

B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2022	FY 2023	FY 2024
Title: 1) INATS CA - SNAPP	-	0.346	0.506

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Chemical and Biological Defense Program		Date: March 2023
Appropriation/Budget Activity 0400 / 7	R-1 Program Element (Number/Name) PE 0607384BP / <i>Chemical and Biological Defense (Operational Systems Development)</i>	Project (Number/Name) MT7 / <i>Mitigate (Op Sys Dev)</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2022	FY 2023	FY 2024
<p>Description: SNAPP Shelf Life Modernization: Studies required by the FDA and/or users to modernize or upgrade medical chemical defense countermeasures.</p> <p>FY 2023 Plans: Continue SNAPP stability studies.</p> <p>FY 2024 Plans: Completing on-going stability activities and initiating New Drug Application (NDA) package preparation for FDA submission.</p> <p>FY 2023 to FY 2024 Increase/Decrease Statement: In FY24 activities are completing due to the acceleration of the program.</p>			
<p>Title: 2) INATS CA - PB Tablet</p> <p>Description: Pyridostigmine Bromide (PB) Extended Release Tablet Development</p> <p>FY 2023 Plans: Continuing Extended Release Tablet Development.</p> <p>FY 2024 Plans: Continue Extended Release Tablet Development.</p> <p>FY 2023 to FY 2024 Increase/Decrease Statement: Decrease due to change in program/project schedule. In FY24 activities are completing early due to the acceleration of the program in prior years.</p>	-	3.664	0.369
<p>Title: 3) MODPROT DE</p> <p>Description: Upgrades, improvements, and modernizations to fielded decontamination systems</p> <p>FY 2023 Plans: Continue to update technical data for spares and repair parts for M26 Joint Service Transportable Decontamination System - Small Scale (JSTDS-SS) Technical Data Package (TDP). Continue to update technical references and validation/verification efforts for M12A1 Power Driven Decontamination Apparatus (PDDA) Technical Manual (TM).</p> <p>FY 2024 Plans:</p>	-	1.088	2.199

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Chemical and Biological Defense Program		Date: March 2023
Appropriation/Budget Activity 0400 / 7	R-1 Program Element (Number/Name) PE 0607384BP / <i>Chemical and Biological Defense (Operational Systems Development)</i>	Project (Number/Name) MT7 / <i>Mitigate (Op Sys Dev)</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2022	FY 2023	FY 2024
Complete the M12 Pressure Accumulator Project. Continue M26 modernization efforts to extend service life and sustainment support, to include Technical Manual (TM) updates with verification and validation. Initiate and complete the M295 and M100 Performance Characterization Project.			
<i>FY 2023 to FY 2024 Increase/Decrease Statement:</i> Increase due to change in program/project schedule. The increase of an additional \$1.1M in FY24 BA7 for tactical decon outdoor testing, which will conduct testing to validate decon TTPs for recent programs, such as Joint Service Equipment Wipe (JSEW), General Purpose Decontaminant (GPD), and Contamination Indicator Decontamination Assurance System (CIDAS).			
Accomplishments/Planned Programs Subtotals	-	5.098	3.074

C. Other Program Funding Summary (\$ in Millions)											
Line Item	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
• DE7: <i>Decontamination (Op Sys Dev)</i>	1.020	-	-	-	-	-	-	-	-	0.000	1.020
• MC5: <i>Medical Chemical Defense (SDD)</i>	38.936	-	-	-	-	-	-	-	-	0.000	38.936
• MC7: <i>Medical Chemical Defense (Op Sys Dev)</i>	1.013	-	-	-	-	-	-	-	-	0.000	1.013
• MT5: <i>Mitigate (SDD)</i>	-	74.225	88.441	-	88.441	92.279	91.431	87.773	93.250	Continuing	Continuing
• JD0050: <i>Decontamination Family Of Systems (DFoS)</i>	7.797	4.795	6.062	-	6.062	8.673	8.820	16.518	5.996	Continuing	Continuing
• PHM040: <i>Improved Nerve Agent Treatment Centrally Acting (INATS CA)</i>	-	-	-	-	-	-	-	6.511	33.883	Continuing	Continuing

Remarks

D. Acquisition Strategy
 IMPROVED NERVE AGENT TREATMENT CENTRALLY ACTING (INATS CA)

The INATS CA BA7 program consists of modernization efforts for the FDA-approved Soman Nerve Agent Pretreatment Pyridostigmine (SNAPP), a medical pre-treatment against nerve agent poisoning, and the development of a novel pyridostigmine bromide (PB) once-a-day tablet that will allow the services an alternative to the currently used SNAPP product. Both efforts utilize contracts and Other Transactional Agreements (OTAs) in which the performer shall be responsible for conducting

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Chemical and Biological Defense Program Date: March 2023

Appropriation/Budget Activity 0400 / 7	R-1 Program Element (Number/Name) PE 0607384BP / <i>Chemical and Biological Defense (Operational Systems Development)</i>	Project (Number/Name) MT7 / <i>Mitigate (Op Sys Dev)</i>
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development and testing activities consistent with current Food and Drug Administration (FDA) regulations. The contractor shall work with the current SNAPP sponsor, the Office of Regulatory Affairs (ORA), to submit all relevant data and forms to the FDA, or in the case of the novel PB once-a-day tablet, sponsor the product to the FDA and hold all approvals and/or licenses.

The Soman Nerve Agent Pre-Treatment Pyridostigmine (SNAPP) effort under INATS CA is a modernization effort for pyridostigmine bromide (PB) tablet requirements from the joint service users for the FDA approved SNAPP product. The effort uses OTAs for conducting development and testing activities consistent with current FDA regulations.

MODERNIZATION DECONTAMINATION (MODPROT DE)

MODPROT DE leverages mature technology from contractor developed components to address and replace obsolete components of various fielded decontamination systems. Modernization efforts will also use items developed by the Government that have transitioned from lower to higher technology readiness levels that can be inserted into fielded systems. A combination of competitive and sole source contracts to various industry vendors and project orders to various Government activities will be used to adapt previously developed components to modernize systems. Robust component and system level testing will validate both Government and contractor furnished improvements. The improvements will be added into the specific system's updated Technical Data Packages (TDPs) to be used in Engineering Change Proposals (ECPs) and provided to the item managers.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Chemical and Biological Defense Program												Date: March 2023			
Appropriation/Budget Activity 0400 / 7						R-1 Program Element (Number/Name) PE 0607384BP / <i>Chemical and Biological Defense (Operational Systems Development)</i>						Project (Number/Name) MT7 / <i>Mitigate (Op Sys Dev)</i>			

Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
INATS CA - HW C - Shelf Life Modernization (SNAPP)	C/CPFF	CMC Pharma : Cleveland, OH	-	0.000		0.150	Dec 2022	0.330	Nov 2023	-		0.330	Continuing	Continuing	0.000
INATS CA - HW C - PB Extended Release	C/FP	Amneal Pharmaceuticals : Hauppauge, NY	-	0.000		2.935	Dec 2022	0.329	Oct 2023	-		0.329	Continuing	Continuing	0.000
INATS CA - HW C - Direct Labor	Various	JPEO Chem, Bio, Rad, and Nuc Defense (JPEO-CBRND) : Aberdeen Proving Ground, MD	-	0.000		0.000		0.040	Nov 2023	-		0.040	Continuing	Continuing	0.000
INATS CA - HW C - Product Management	Various	JPM CBRN Medical, JPEO-CBRND : Fort Detrick, MD	-	0.000		0.000		0.080	Nov 2023	-		0.080	Continuing	Continuing	0.000
MODPROT DE - HW C - M26 Tech Data Package; Modernization Update / M12A1 TM Update	Various	Various : N/A	-	0.000		0.787	Nov 2022	1.735	Nov 2023	-		1.735	Continuing	Continuing	0.000
Subtotal			-	0.000		3.872		2.514		-		2.514	Continuing	Continuing	N/A

Support (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
MODPROT DE - DTE C - IPT, Engineering, Technical, Logistics Support	MIPR	Various : N/A	-	0.000		0.230	Nov 2022	0.329	Nov 2023	-		0.329	Continuing	Continuing	0.000
Subtotal			-	0.000		0.230		0.329		-		0.329	Continuing	Continuing	N/A

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Exhibit R-4, RDT&E Schedule Profile: PB 2024 Chemical and Biological Defense Program		Date: March 2023
Appropriation/Budget Activity 0400 / 7	R-1 Program Element (Number/Name) PE 0607384BP / <i>Chemical and Biological Defense (Operational Systems Development)</i>	Project (Number/Name) MT7 / <i>Mitigate (Op Sys Dev)</i>

	FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027				FY 2028			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
INATS CA - MS B-Milestone B																												
INATS CA - Clinical Trials																												
INATS CA - Manufacturing/Auto-Injector																												
INATS CA - Non-Clinical Studies																												
INATS CA - NDA Submission-New Drug Application Submission																												
INATS CA - FDA Approval-Food and Drug Administration Approval																												
INATS CA - SNAPP Modernization - BA7																												
INATS CA - PB Extended Release Tablet Development - BA7																												
MODPROT DE - M12A1 TM Update																												
MODPROT DE - M26 JSTDS-SS TDP																												
MODPROT DE - M26 JSTDS-SS Modernization																												
MODPROT DE - M12 Pressure Accumulator																												
MODPROT DE - M295 & M100 Performance Characterization																												

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Chemical and Biological Defense Program		Date: March 2023
Appropriation/Budget Activity 0400 / 7	R-1 Program Element (Number/Name) PE 0607384BP / <i>Chemical and Biological Defense (Operational Systems Development)</i>	Project (Number/Name) MT7 / <i>Mitigate (Op Sys Dev)</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
INATS CA - MS B-Milestone B	2	2022	2	2022
INATS CA - Clinical Trials	1	2022	4	2024
INATS CA - Manufacturing/Auto-Injector	1	2022	2	2025
INATS CA - Non-Clinical Studies	1	2022	2	2025
INATS CA - NDA Submission-New Drug Application Submission	1	2026	3	2026
INATS CA - FDA Approval-Food and Drug Administration Approval	3	2026	1	2028
INATS CA - SNAPP Modernization - BA7	1	2022	4	2025
INATS CA - PB Extended Release Tablet Development - BA7	1	2023	1	2026
MODPROT DE - M12A1 TM Update	1	2022	4	2023
MODPROT DE - M26 JSTDS-SS TDP	1	2022	4	2023
MODPROT DE - M26 JSTDS-SS Modernization	1	2022	4	2025
MODPROT DE - M12 Pressure Accumulator	1	2024	4	2024
MODPROT DE - M295 & M100 Performance Characterization	1	2024	4	2024

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Chemical and Biological Defense Program **Date:** March 2023

Appropriation/Budget Activity 0400 / 7	R-1 Program Element (Number/Name) PE 0607384BP / <i>Chemical and Biological Defense (Operational Systems Development)</i>	Project (Number/Name) CA7 / <i>Contamination Avoidance (Op Sys Dev)</i>
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COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
CA7: <i>Contamination Avoidance (Op Sys Dev)</i>	-	12.244	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	12.244
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-	-	-

A. Mission Description and Budget Item Justification

The Project supports technology upgrade and refresh of fielded dismounted reconnaissance and detection systems that minimize chemical, biological, and radiological (CBR) contamination and prevent further cross-contamination during operations. In FY2023, the CBDP RDT&E Projects have been restructured to align to the CBDP portfolio. CA7 efforts in FY2022 progress to the Understand (UN7) portfolio. This restructuring is intended to provide standardization and alignment across CBDP research, development and acquisition efforts.

Efforts included in this Project are:

- (1) Enhanced Maritime Biological Detection (EMBD) ****Progresses to UN7 in FY2023****, and
- (2) Modernization Sensors (MOD SEN) ****Progresses to UN7 in FY2023****

The EMBD program will undertake engineering efforts to combat Diminishing Manufacturing Sources and Material Shortages (DMSMS) and maintain a stable production line. Specific efforts in FY24 include flash memory and in the Rapid Agent Aerosol Detector (RAAD), multiple circuit card electrical components and Developmental Testing (DT).

The MOD SEN program addresses obsolescence of critical equipment and functionality issues for the Services by establishing a modernization plan to integrate and incorporate advancements in technology for the Analytical Laboratory System Modification (ALS MOD), Common Analytical Laboratory System (CALS) Field Confirmatory Analytical Capability Set (FC ACS), CALS Theater Validation Integrated System (TV IS), CBRN Dismounted Reconnaissance System (DRS), and M8 Modernization. In FY24, MOD SEN supports the evaluation of components for technical refreshment of the CBRN DRS, CALS, ALS MOD, M8, and EMBD under UN7.

B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2022	FY 2023	FY 2024
Title: 1) EMBD	0.869	-	-
Description: Obsolescence and replacement efforts			
Title: 2) MOD SEN	11.375	-	-
Description: Sensors Modernization			

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Chemical and Biological Defense Program		Date: March 2023
Appropriation/Budget Activity 0400 / 7	R-1 Program Element (Number/Name) PE 0607384BP / <i>Chemical and Biological Defense (Operational Systems Development)</i>	Project (Number/Name) CA7 / <i>Contamination Avoidance (Op Sys Dev)</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2022	FY 2023	FY 2024
Accomplishments/Planned Programs Subtotals	12.244	-	-

C. Other Program Funding Summary (\$ in Millions)

<u>Line Item</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024 Base</u>	<u>FY 2024 OCO</u>	<u>FY 2024 Total</u>	<u>FY 2025</u>	<u>FY 2026</u>	<u>FY 2027</u>	<u>FY 2028</u>	<u>Cost To Complete</u>	<u>Total Cost</u>
• CA5: <i>Contamination Avoidance (SDD)</i>	84.967	-	-	-	-	-	-	-	-	0.000	84.967
• CM7: <i>Homeland Defense (Op Sys Dev)</i>	1.463	-	-	-	-	-	-	-	-	0.000	1.463
• UN7: <i>Understand (Op Sys Dev)</i>	-	40.414	50.603	-	50.603	58.881	71.869	68.839	50.628	Continuing	Continuing
• JS0005: <i>Common Analytical Laboratory System (CALS)</i>	48.258	30.530	7.167	-	7.167	-	-	-	-	0.000	128.728
• MC0101: <i>CBRN Dismounted Reconnaissance Systems (CBRN DRS)</i>	21.611	47.324	60.492	-	60.492	64.556	37.802	23.292	-	Continuing	Continuing
• SA0003: <i>Enhanced Maritime Biological Detection (EMBD)</i>	21.473	21.472	21.899	-	21.899	21.203	26.500	2.240	-	Continuing	Continuing
• SA0025: <i>Analytical Laboratory System Modification (ALS MOD)</i>	1.056	3.894	4.256	-	4.256	4.806	5.088	9.137	15.109	Continuing	Continuing

Remarks

D. Acquisition Strategy

ENHANCED MARITIME BIOLOGICAL DETECTION (EMBD)

The EMBD program uses a streamlined acquisition strategy and awarded a Full Rate Production (FRP) contract in 1QFY22 with options for production of EMBD kits and Obsolescence Support in Production (OSIP) to resolve diminishing sources and obsolescence issues. The FY24 OSIP Option will address major obsolescence problems identified by the prime contractor that could affect a stable production line and to ensure new EMBD hardware/software remains procurable, field upgradeable and backwards compatible with previously fielded units. The FY24 OSIP Option will undertake engineering efforts to resolve obsolescence of the flash memory in the Rapid Agent Aerosol Detector (RAAD), multiple circuit card electrical components and Developmental Testing (DT) of all new components.

MODERNIZATION SENSORS (MOD SEN)

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Chemical and Biological Defense Program		Date: March 2023
Appropriation/Budget Activity 0400 / 7	R-1 Program Element (Number/Name) PE 0607384BP / <i>Chemical and Biological Defense (Operational Systems Development)</i>	Project (Number/Name) CA7 / <i>Contamination Avoidance (Op Sys Dev)</i>
<p>MOD SEN program uses a Commercial Off-The-Shelf (COTS)/Government Off-The-Shelf (GOTS) approach to manage modernization for multiple CBRN sensor programs. This strategy employs a Non-developmental Item acquisition concept to translate mission needs and emerging technology capabilities into a fieldable component to solve obsolescence and technology update needs. Current planned funding supports CALS TV-IS, FC-ACS, ALS MOD, CBRN DRS, M8 Modification, and EMBD modernization activities. The program maintains baseline capabilities with obsolescence management, technology insertions, and enhancements based on changes in requirements. This program modernizes the Joint Force to combat advancing threats and current capability gaps in analytical laboratory and sensitive site assessment and exploitation capabilities require a system modernization strategy for each system.</p>		

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Chemical and Biological Defense Program												Date: March 2023			
Appropriation/Budget Activity 0400 / 7						R-1 Program Element (Number/Name) PE 0607384BP / Chemical and Biological Defense (Operational Systems Development)						Project (Number/Name) CA7 / Contamination Avoidance (Op Sys Dev)			

Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
EMBD - HW SB - Obsolescence Support in Production	C/CPIF	Various : N/A	-	0.469	Dec 2021	0.000		0.000		-		0.000	0.000	0.469	0.000
MOD SEN - HW C - Government Product Development Team Labor	MIPR	U.S. Army Combat Capabilities Development Command (DEVCOM) Chemical Biological Center (CBC) : Aberdeen Proving Ground, MD	-	1.285	Feb 2022	0.000		0.000		-		0.000	0.000	1.285	0.000
MOD SEN - HW C - System Modernization	C/FFP	FLIR Systems, Inc. : Elkridge, MD	-	6.817	Jan 2022	0.000		0.000		-		0.000	0.000	6.817	0.000
MOD SEN - SW C - Training Software	MIPR	CCDC AVIATION AND MISSILE CENTER : Huntsville, AL	-	0.121	Jul 2022	0.000		0.000		-		0.000	0.000	0.121	0.000
MOD SEN - HW C - Technology Readiness Evaluation	C/FFP	MRIGlobal : Kansas City, MO	-	0.712	Jul 2022	0.000		0.000		-		0.000	0.000	0.712	0.000
MOD SEN - HW C - Cost Estimating Support	C/FFP	DCS Corps : Alexandria, VA	-	0.034	Jul 2022	0.000		0.000		-		0.000	0.000	0.034	0.000
Subtotal			-	9.438		0.000		0.000		-		0.000	0.000	9.438	N/A

Support (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
MOD SEN - Test Support	MIPR	Various : N/A	-	0.232	Apr 2022	0.000		0.000		-		0.000	0.000	0.232	0.000
MOD SEN - Science and Engineering Support	C/FFP	Johns Hopkins University - Applied	-	0.191	Jul 2022	0.000		0.000		-		0.000	0.000	0.191	0.000

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Chemical and Biological Defense Program												Date: March 2023		
Appropriation/Budget Activity 0400 / 7						R-1 Program Element (Number/Name) PE 0607384BP / Chemical and Biological Defense (Operational Systems Development)						Project (Number/Name) CA7 / Contamination Avoidance (Op Sys Dev)		

Support (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
		Physics Laboratory : Laurel, MD													
MOD SEN - ES C - Engineering Support	MIPR	U.S. Army Combat Capabilities Development Command (DEVCOM) Chemical Biological Center (CBC) : Aberdeen Proving Ground, MD	-	0.046	Jul 2022	0.000		0.000		-		0.000	0.000	0.046	0.000
MOD SEN - ES C - Program OGA Support	Various	Various : N/A	-	0.071	Jul 2022	0.000		0.000		-		0.000	0.000	0.071	0.000
Subtotal			-	0.540		0.000		0.000		-		0.000	0.000	0.540	N/A

Test and Evaluation (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
EMBD - Obsolescence Support in Production testing and verification	C/CPIF	Various : N/A	-	0.252	Dec 2021	0.000		0.000		-		0.000	0.000	0.252	0.000
MOD SEN - DTE C - Information Assurance	MIPR	U.S. Army Combat Capabilities Development Command (DEVCOM) Armaments Center : Picatinny, NJ	-	0.279	Jul 2022	0.000		0.000		-		0.000	0.000	0.279	0.000
MOD SEN - DTE C - Component Test and Evaluation	MIPR	Aberdeen Test Center (ATC) : Aberdeen Proving Ground, MD	-	0.480	Apr 2022	0.000		0.000		-		0.000	0.000	0.480	0.000
Subtotal			-	1.011		0.000		0.000		-		0.000	0.000	1.011	N/A

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Exhibit R-4, RDT&E Schedule Profile: PB 2024 Chemical and Biological Defense Program		Date: March 2023
Appropriation/Budget Activity 0400 / 7	R-1 Program Element (Number/Name) PE 0607384BP / <i>Chemical and Biological Defense (Operational Systems Development)</i>	Project (Number/Name) CA7 / <i>Contamination Avoidance (Op Sys Dev)</i>

	FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027				FY 2028			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
EMBD - IOC-Initial Operational Capability																												
EMBD - FRP Production																												
EMBD - FOC-Full Operational Capability																												
MOD SEN - DT/OT for refreshed components and obsolescence management within MOD SEN																												

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Chemical and Biological Defense Program		Date: March 2023
Appropriation/Budget Activity 0400 / 7	R-1 Program Element (Number/Name) PE 0607384BP / <i>Chemical and Biological Defense (Operational Systems Development)</i>	Project (Number/Name) CA7 / <i>Contamination Avoidance (Op Sys Dev)</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
EMBD - IOC-Initial Operational Capability	2	2023	2	2023
EMBD - FRP Production	1	2022	3	2027
EMBD - FOC-Full Operational Capability	4	2028	4	2028
MOD SEN - DT/OT for refreshed components and obsolescence management within MOD SEN	1	2023	4	2028

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Chemical and Biological Defense Program **Date:** March 2023

Appropriation/Budget Activity 0400 / 7	R-1 Program Element (Number/Name) PE 0607384BP / Chemical and Biological Defense (Operational Systems Development)	Project (Number/Name) CM7 / Homeland Defense (Op Sys Dev)
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COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
CM7: Homeland Defense (Op Sys Dev)	-	1.463	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.463
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This project supports technology refresh of fielded analytical laboratory system capabilities which allows the conduct on-site analysis of any unknown sample and test potential life-threatening substances. In FY2023, the CBDP RDT&E Projects have been restructured to align to the CBDP portfolio. CM7 efforts in FY2022 progress to the Understand (UN7) portfolio. This restructuring is intended to provide standardization and alignment across CBDP research, development and acquisition efforts.

The effort included in this Project is:

- (1) Weapons of Mass Destruction - Civil Support Team (WMD CST) **Progresses to UN7 in FY2023**

The WMD CST program supports the fielded system upgrade and ongoing assessment and acquisition of commercial off-the-shelf (COTS) and Government off-the-shelf (GOTS) analytical detection, protection, decontamination and sampling equipment for survey in order to expand/enhance the operational capabilities of the (57) WMD CST Teams. Program efforts support upgrades of key components of the WMD CST Program that have become obsolete, or are no longer being supported by the manufacturer. In FY24 the WMD CST program continues system-related test activities, including costs of specially fabricated hardware to obtain or validate engineering data on the performance of the system.

B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2022	FY 2023	FY 2024
Title: 1) WMD CST	1.463	-	-
Description: System Upgrade and Support			
Accomplishments/Planned Programs Subtotals	1.463	-	-

C. Other Program Funding Summary (\$ in Millions)

<u>Line Item</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024 Base</u>	<u>FY 2024 OCO</u>	<u>FY 2024 Total</u>	<u>FY 2025</u>	<u>FY 2026</u>	<u>FY 2027</u>	<u>FY 2028</u>	<u>Cost To Complete</u>	<u>Total Cost</u>
• UN7: Understand (Op Sys Dev)	-	40.414	50.603	-	50.603	58.881	71.869	68.839	50.628	Continuing	Continuing

Remarks

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2024 Chemical and Biological Defense Program		Date: March 2023
Appropriation/Budget Activity 0400 / 7	R-1 Program Element (Number/Name) PE 0607384BP / <i>Chemical and Biological Defense (Operational Systems Development)</i>	Project (Number/Name) CM7 / <i>Homeland Defense (Op Sys Dev)</i>

D. Acquisition Strategy
WMD - CIVIL SUPPORT TEAMS (WMD CST)

The Weapons of Mass Destruction Civil Support Team Program (WMD-CST) is a COTS based program that supports the evaluation of advancements in CBRN commercial off the shelf (COTS)/government-off-the-shelf (GOTS) equipment against the current technology baseline of equipment fielded to the (57) WMD CST Teams, this is to address analytical equipment obsolescence.

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Chemical and Biological Defense Program **Date:** March 2023

Appropriation/Budget Activity 0400 / 7	R-1 Program Element (Number/Name) PE 0607384BP / Chemical and Biological Defense (Operational Systems Development)	Project (Number/Name) CM7 / Homeland Defense (Op Sys Dev)
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Support (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
WMD CST - ES C - Science & Engineering Support	MIPR	Various : N/A	0.096	0.250	Nov 2021	0.000		0.000		-		0.000	0.000	0.346	0.000
Subtotal			0.096	0.250		0.000		0.000		-		0.000	0.000	0.346	N/A

Test and Evaluation (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
WMD CST - OTHC C - CBRN COTS Component	MIPR	U.S. Army Combat Capabilities Development Command (DEVCOM) Chemical Biological Center (CBC) : Aberdeen Proving Ground, MD	7.372	1.051	Feb 2022	0.000		0.000		-		0.000	0.000	8.423	0.000
Subtotal			7.372	1.051		0.000		0.000		-		0.000	0.000	8.423	N/A

Management Services (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
WMD CST - PM/MS S - Program Management Support	MIPR	Various : N/A	2.625	0.162	Dec 2021	0.000		0.000		-		0.000	0.000	2.787	0.000
Subtotal			2.625	0.162		0.000		0.000		-		0.000	0.000	2.787	N/A

			Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			10.093	1.463	0.000	0.000	-	0.000	0.000	11.556	N/A

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Exhibit R-4, RDT&E Schedule Profile: PB 2024 Chemical and Biological Defense Program		Date: March 2023
Appropriation/Budget Activity 0400 / 7	R-1 Program Element (Number/Name) PE 0607384BP / <i>Chemical and Biological Defense (Operational Systems Development)</i>	Project (Number/Name) CM7 / <i>Homeland Defense (Op Sys Dev)</i>

FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027				FY 2028			
1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4

WMD CST - Upgrade Fielded Systems

[REDACTED]																											
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UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: PB 2024 Chemical and Biological Defense Program		Date: March 2023
Appropriation/Budget Activity 0400 / 7	R-1 Program Element (Number/Name) PE 0607384BP / <i>Chemical and Biological Defense (Operational Systems Development)</i>	Project (Number/Name) CM7 / <i>Homeland Defense (Op Sys Dev)</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
WMD CST - Upgrade Fielded Systems	1	2022	4	2027

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Chemical and Biological Defense Program **Date:** March 2023

Appropriation/Budget Activity 0400 / 7	R-1 Program Element (Number/Name) PE 0607384BP / Chemical and Biological Defense (Operational Systems Development)	Project (Number/Name) C07 / Collective Protection (Op Sys Dev)
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COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
C07: Collective Protection (Op Sys Dev)	-	9.645	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	9.645
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This project provides for technology upgrade and refresh of fielded Collective Protection (CP) equipment and systems that are smaller, lighter, less costly to produce and maintain, and more logistically supportable enabling mission accomplishment in spaces safe from the effects of chemical, biological, and radiological (CBR) contamination. In FY2023, the CBDP RDT&E Projects have been restructured to align to the CBDP portfolio. C07 efforts in FY2022 progress to the Protect (PT7) portfolio. This restructuring is intended to provide standardization and alignment across CBDP research, development and acquisition efforts.

The effort included in this Project is:

- (1) Modernization Protection Collective Protection (MODPROT CP) **Progresses to PT7 in FY2023**

Modernization Protection Collective Protection (MODPROT CP) incorporates a value engineering approach to address the need to reduce logistics cost and minimizes supply chain shortages by addressing obsolescence issues to the DoD /Joint Services fielded Chemical Biological and Radiological (CBR) protection portfolio for mobile, transportable, fixed facility and shipboard CP systems without the high cost of requiring a new program of record. The obsolescence of critical equipment, if not modernized, will continue to face significantly increased cost and long lead times making the equipment unaffordable and unprocurable to meet major weapon system program's requirements and schedules. MODPROT CP modernizes decades old collective protection equipment reducing costs, shortening lead times, and updating key components to extend service life and ensure affordable and procurable to warfighters.

B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2022	FY 2023	FY 2024
Title: 1) MODPROT CP	9.645	-	-
Description: Upgrades, improvements, and modernizations to fielded CP systems			
Accomplishments/Planned Programs Subtotals	9.645	-	-

C. Other Program Funding Summary (\$ in Millions)

Line Item	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
• CO5: Collective Protection (SDD)	2.888	-	-	-	-	-	-	-	-	0.000	2.888
• PT7: Protect (Op Sys Dev)	-	20.076	26.818	-	26.818	22.815	15.490	14.193	13.612	Continuing	Continuing

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Chemical and Biological Defense Program		Date: March 2023
Appropriation/Budget Activity 0400 / 7	R-1 Program Element (Number/Name) PE 0607384BP / <i>Chemical and Biological Defense (Operational Systems Development)</i>	Project (Number/Name) C07 / <i>Collective Protection (Op Sys Dev)</i>

C. Other Program Funding Summary (\$ in Millions)

<u>Line Item</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2024</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>FY 2026</u>	<u>FY 2027</u>	<u>FY 2028</u>	<u>Cost To</u>	
			<u>Base</u>	<u>OCO</u>	<u>Total</u>					<u>Complete</u>	<u>Total Cost</u>
• JP1111: <i>Joint Expeditionary Collective Protection (JECP)</i>	22.719	30.737	-	-	-	3.000	3.750	-	-	Continuing	Continuing
• PHM036: <i>Modernization Protection Collective Protection (MODPROT CP)</i>	1.385	1.385	-	-	-	-	-	1.375	2.517	Continuing	Continuing

Remarks

D. Acquisition Strategy

MODERNIZATION PROTECTION COLLECTIVE PROTECTION (MODPROT CP)

Modernization Protection Collective Protection (MODPROT CP) leverages mature technology from contractor developed components to address and replace obsolete components of various fielded collective protection systems. Modernization efforts will also use items developed by the Government that have transitioned from lower to higher technology readiness levels that can be inserted into fielded systems. A combination of competitive and sole source contracts to various industry vendors and project orders to various Government activities will be used to adapt previously developed components to modernize systems. Robust component and system level testing to meet applicable military standards will validate both Government and contractor furnished improvements. The improvements will be added into the specific systems' updated Technical Data Packages (TDPs) to be used in Engineering Change Proposals (ECPs) and provided to the item managers.

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Chemical and Biological Defense Program **Date:** March 2023

Appropriation/Budget Activity 0400 / 7	R-1 Program Element (Number/Name) PE 0607384BP / Chemical and Biological Defense (Operational Systems Development)	Project (Number/Name) C07 / Collective Protection (Op Sys Dev)
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Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
MODPROT CP - HW C - Collective Protection Modernization for Ships	Various	Various : N/A	0.773	2.295	Nov 2021	0.000		0.000		-		0.000	0.000	3.068	0.000
MODPROT CP - HW C - Filter Redesign, Non-Destructive Leak Test, ColPro Training Dev	MIPR	Various : N/A	2.815	0.736	Nov 2021	0.000		0.000		-		0.000	0.000	3.551	0.000
MODPROT CP - HW C - Collective Protection Modernization for Ships	Various	Indian Head : Indian Head, MD	1.909	3.021	Nov 2021	0.000		0.000		-		0.000	0.000	4.930	0.000
Subtotal			5.497	6.052		0.000		0.000		-		0.000	0.000	11.549	N/A

Support (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
MODPROT CP - IPT, Technical, Engineering and Logistics Support	MIPR	Various : N/A	0.704	0.735	Dec 2021	0.000		0.000		-		0.000	0.000	1.439	0.000
Subtotal			0.704	0.735		0.000		0.000		-		0.000	0.000	1.439	N/A

Test and Evaluation (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
MODPROT CP - DTE C - CP Modernization Testing	Various	Various : N/A	1.137	2.183	Nov 2021	0.000		0.000		-		0.000	0.000	3.320	0.000
Subtotal			1.137	2.183		0.000		0.000		-		0.000	0.000	3.320	N/A

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Exhibit R-4, RDT&E Schedule Profile: PB 2024 Chemical and Biological Defense Program		Date: March 2023
Appropriation/Budget Activity 0400 / 7	R-1 Program Element (Number/Name) PE 0607384BP / <i>Chemical and Biological Defense (Operational Systems Development)</i>	Project (Number/Name) C07 / <i>Collective Protection (Op Sys Dev)</i>

	FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027				FY 2028			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
MODPROT CP - M93 GPFU Electro Magnetic Interference	██████████																											
MODPROT CP - Non Destructive (ND) Acceptance Leak Test CP Filters	██████████																											
MODPROT CP - Environmental M98 Guard Bed Testing	██████████																											
MODPROT CP - M49 Filter Modernization	██████████																											
MODPROT CP - Filter Prototype Design Analysis and Development	██████████																											
MODPROT CP - Collective Protection Training Development	██████████																											
MODPROT CP - M48A1 Filter Redesign	██████████				██████████				██████████				██████████				██████████				██████████							
MODPROT CP - Collective Protection Modernization for Ships and Buildings	██████████				██████████				██████████				██████████				██████████				██████████							
MODPROT CP - M14 Protective Entrance Modernization	██████████																											
MODPROT CP - Filter Prototype Laboratory Testing and Evaluation					██████████																							
MODPROT CP - Contaminated Filter Changeout Procedures					██████████																							
MODPROT CP - Filter Technical Design Package and Procurement of Filter Design Test Articles					██████████																							
MODPROT CP - Platform Interoperability Testing and Final Technical Design Package									██████████																			
MODPROT CP - Mobile Platform Filter Modernization													██████████															

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Exhibit R-4, RDT&E Schedule Profile: PB 2024 Chemical and Biological Defense Program **Date:** March 2023

Appropriation/Budget Activity 0400 / 7	R-1 Program Element (Number/Name) PE 0607384BP / <i>Chemical and Biological Defense (Operational Systems Development)</i>	Project (Number/Name) C07 / <i>Collective Protection (Op Sys Dev)</i>
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	FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027				FY 2028			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
MODPROT CP - Filter Surveillance Testing																												

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Chemical and Biological Defense Program		Date: March 2023
Appropriation/Budget Activity 0400 / 7	R-1 Program Element (Number/Name) PE 0607384BP / <i>Chemical and Biological Defense (Operational Systems Development)</i>	Project (Number/Name) C07 / <i>Collective Protection (Op Sys Dev)</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
MODPROT CP - M93 GPFU Electro Magnetic Interference	1	2022	4	2022
MODPROT CP - Non Destructive (ND) Acceptance Leak Test CP Filters	1	2022	4	2022
MODPROT CP - Environmental M98 Guard Bed Testing	1	2022	4	2022
MODPROT CP - M49 Filter Modernization	1	2022	4	2022
MODPROT CP - Filter Prototype Design Analysis and Development	1	2022	4	2022
MODPROT CP - Collective Protection Training Development	1	2022	4	2022
MODPROT CP - M48A1 Filter Redesign	1	2022	4	2025
MODPROT CP - Collective Protection Modernization for Ships and Buildings	1	2022	4	2026
MODPROT CP - M14 Protective Entrance Modernization	1	2022	4	2022
MODPROT CP - Filter Prototype Laboratory Testing and Evaluation	1	2023	2	2023
MODPROT CP - Contaminated Filter Changeout Procedures	3	2022	4	2023
MODPROT CP - Filter Technical Design Package and Procurement of Filter Design Test Articles	1	2023	4	2023
MODPROT CP - Platform Interoperability Testing and Final Technical Design Package	1	2024	4	2024
MODPROT CP - Mobile Platform Filter Modernization	1	2025	4	2025
MODPROT CP - Filter Surveillance Testing	1	2025	4	2028

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2024 Chemical and Biological Defense Program **Date:** March 2023

Appropriation/Budget Activity 0400 / 7	R-1 Program Element (Number/Name) PE 0607384BP / <i>Chemical and Biological Defense (Operational Systems Development)</i>	Project (Number/Name) DE7 / <i>Decontamination (Op Sys Dev)</i>
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COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
DE7: <i>Decontamination (Op Sys Dev)</i>	-	1.020	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.020
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This project addresses obsolescence issues with decontamination equipment and the need to modernize the Joint Services fielded chemical and biological with capabilities meeting or exceeding the Services requirements. In FY2023, the CBDP RDT&E Projects have been restructured to align to the CBDP portfolio. DE7 efforts in FY2022 progress to the Mitigate (MT7) portfolio. This restructuring is intended to provide standardization and alignment across CBDP research, development and acquisition efforts.

The effort included in this project is:

- (1) Modernization Protection Decontamination (MODPROT DE) **Progresses to MT7 in FY2023**

Modernization Protection Decontamination (MODPROT DE) addresses obsolescence and technical data concerns, beginning with the M26 Joint Services Transportable Decontamination System-Small Scale (JSTDS-SS) through validation and verification of Technical Manual (TM) changes as well as technical data for spare and repair parts; the M12A1 Power Driven Decontamination Apparatus (PDDA) by updating technical references and performing the necessary validation and verification before publishing an updated Technical Manual (TM); Conduct biological efficacy at relevant environment (i.e. ambient, desert, cold) for Joint Service Equipment Wipe (JSEW) to expand wipe capabilities to include performance against biological agents.

B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2022	FY 2023	FY 2024
Title: 1) MODPROT DE	1.020	-	-
Description: Upgrades, improvements, and modernizations to fielded decontamination systems			
Accomplishments/Planned Programs Subtotals	1.020	-	-

C. Other Program Funding Summary (\$ in Millions)

<u>Line Item</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024 Base</u>	<u>FY 2024 OCO</u>	<u>FY 2024 Total</u>	<u>FY 2025</u>	<u>FY 2026</u>	<u>FY 2027</u>	<u>FY 2028</u>	<u>Cost To Complete</u>	<u>Total Cost</u>
• MT7: <i>Mitigate (Op Sys Dev)</i>	-	5.098	3.074	-	3.074	1.987	1.819	1.845	1.862	Continuing	Continuing
• JD0050: <i>Decontamination Family Of Systems (DFoS)</i>	7.797	4.795	6.062	-	6.062	8.673	8.820	16.518	5.996	Continuing	Continuing

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Chemical and Biological Defense Program		Date: March 2023
Appropriation/Budget Activity 0400 / 7	R-1 Program Element (Number/Name) PE 0607384BP / <i>Chemical and Biological Defense (Operational Systems Development)</i>	Project (Number/Name) DE7 / <i>Decontamination (Op Sys Dev)</i>

C. Other Program Funding Summary (\$ in Millions)

<u>Line Item</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u> <u>Base</u>	<u>FY 2024</u> <u>OCO</u>	<u>FY 2024</u> <u>Total</u>	<u>FY 2025</u>	<u>FY 2026</u>	<u>FY 2027</u>	<u>FY 2028</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
Remarks											

D. Acquisition Strategy
 MODERNIZATION DECONTAMINATION (MODPROT DE)

MODPROT DE leverages mature technology from contractor developed components to address and replace obsolete components of various fielded decontamination systems. Modernization efforts will also use items developed by the Government that have transitioned from lower to higher technology readiness levels that can be inserted into fielded systems. A combination of competitive and sole source contracts to various industry vendors and project orders to various Government activities will be used to adapt previously developed components to modernize systems. Robust component and system level testing will validate both Government and contractor furnished improvements. The improvements will be added into the specific system's updated Technical Data Packages (TDPs) to be used in Engineering Change Proposals (ECPs) and provided to the item managers.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Chemical and Biological Defense Program **Date:** March 2023

Appropriation/Budget Activity 0400 / 7	R-1 Program Element (Number/Name) PE 0607384BP / Chemical and Biological Defense (Operational Systems Development)	Project (Number/Name) DE7 / Decontamination (Op Sys Dev)
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Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
MODPROT DE - HW C - M26 Tech Data Package; Modernization Update / M12A1 TM Update, JSEW	MIPR	Various : N/A	0.365	0.534	Nov 2021	0.000		0.000		-		0.000	0.000	0.899	0.000
Subtotal			0.365	0.534		0.000		0.000		-		0.000	0.000	0.899	N/A

Support (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
MODPROT DE - DTE C - IPT, Engineering, Technical, Logistics Support	MIPR	Various : N/A	0.268	0.406	Oct 2021	0.000		0.000		-		0.000	0.000	0.674	0.000
Subtotal			0.268	0.406		0.000		0.000		-		0.000	0.000	0.674	N/A

Management Services (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
MODPROT DE - PM/MS C - Program Management Support	Various	Various : N/A	-	0.080	Oct 2021	0.000		0.000		-		0.000	0.000	0.080	0.000
Subtotal			-	0.080		0.000		0.000		-		0.000	0.000	0.080	N/A

			Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			0.633	1.020	0.000	0.000	-	0.000	0.000	1.653	N/A

Remarks

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: PB 2024 Chemical and Biological Defense Program		Date: March 2023
Appropriation/Budget Activity 0400 / 7	R-1 Program Element (Number/Name) PE 0607384BP / <i>Chemical and Biological Defense (Operational Systems Development)</i>	Project (Number/Name) DE7 / <i>Decontamination (Op Sys Dev)</i>

	FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027				FY 2028			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
MODPROT DE - M12A1 TM Update	[REDACTED]																											
MODPROT DE - M26 JSTDS-SS TDP	[REDACTED]																											
MODPROT DE - M26 JSTDS-SS Modernization	[REDACTED]																											
MODPROT DE - M12 Pressure Accumulator	[REDACTED]																											
MODPROT DE - M295 & M100 Performance Characterization	[REDACTED]																											

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Chemical and Biological Defense Program		Date: March 2023
Appropriation/Budget Activity 0400 / 7	R-1 Program Element (Number/Name) PE 0607384BP / <i>Chemical and Biological Defense (Operational Systems Development)</i>	Project (Number/Name) DE7 / <i>Decontamination (Op Sys Dev)</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
MODPROT DE - M12A1 TM Update	1	2022	4	2023
MODPROT DE - M26 JSTDS-SS TDP	1	2022	4	2023
MODPROT DE - M26 JSTDS-SS Modernization	1	2022	4	2025
MODPROT DE - M12 Pressure Accumulator	1	2024	4	2024
MODPROT DE - M295 & M100 Performance Characterization	1	2024	4	2024

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Chemical and Biological Defense Program										Date: March 2023		
Appropriation/Budget Activity 0400 / 7					R-1 Program Element (Number/Name) PE 0607384BP / <i>Chemical and Biological Defense (Operational Systems Development)</i>				Project (Number/Name) IP7 / <i>Individual Protection (Op Sys Dev)</i>			
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
IP7: <i>Individual Protection (Op Sys Dev)</i>	-	11.659	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	11.659
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The project supports technology refresh of fielded individual protective equipment which enable the warfighter to operate in a contaminated CBR environment with little or no degradation to his/her performance. In FY2023, the CBDP RDT&E Projects have been restructured to align to the CBDP portfolio. IP7 efforts in FY2022 progress to the Protect (PT7) and Understand (UN7) portfolios. This restructuring is intended to provide standardization and alignment across CBDP research, development and acquisition efforts.

Efforts included in this Project are:

- (1) Modernization Protection Individual Protection (MODPROT IP) ****Progresses to PT7 in FY2023****, and
- (2) Special Purpose Unit Rapid Capability Development and Deployment (SPU RCDD) ****Progresses to UN7 in FY2023****

Modernization Protection Individual Protection (MODPROT IP) addresses obsolescence issues with Individual Protective (IP) equipment and the need to modernize fielded IP with capabilities to meet or exceed the Services requirements. MODPROT IP will also conduct modernization efforts and reverse engineering of maintenance and repair procedures for the Joint Services Mask Leakage Tester (JSMLT). MODPROT IP will also provide mask and filter system upgrades and modernization of fielded protection systems to enhance respiratory and ocular protection resulting in an increased lethality of fighter aircraft by mitigating risk due to operationally unsuitable aircrew Chemical Biological Radiological Nuclear (CBRN) masks. Modernization efforts will include technical manual updates and a Logistics Demonstration for an updated, lightweight version of the Joint Protective Aircrew Ensemble (JPACE). Testing and analysis with aircraft will fully validate and refine new Tactics, Techniques and Procedures (TTPs) that allow aircrews to operate without restrictive CBRN protective equipment by determining time and techniques required to reduce cockpit hazards to acceptable levels by flushing with clean air. The impact of funding these programs will address modernization and obsolescence across the DoD IP portfolio to increase readiness, sustainability, reliability, and affordability of these systems.

SPU RCDD facilitates Joint Special Operations Command (JSOC) rapid response requirements to near-term and emergent chemical-biological defensive capabilities. This includes select elements from across the Special Operations Force (SOF) Enterprise such as CBRN Assessment Response Teams (CARTs) and other Joint Force enabling units such as the 20th Chemical, Biological, Radiological, Nuclear and Explosives Command. SPU RCDD mitigates risk across the Chemical Biological Defense Program (CBDP) by creating a portfolio of operationally-relevant CB capabilities that can be quickly transitioned in response to the articulated, emergent capability needs of the geographic combatant commanders. These objectives are met by the early transitioning of promising science and technologies (S&T); the focused conduct of combat evaluations and mission-oriented operational assessments to assess technological and mission suitability; and the active leveraging of existing Commercial-Off-The-Shelf (COTS) and Government-Off-The-Shelf (GOTS) products along with novel redesign approaches to optimize existing solutions to

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Chemical and Biological Defense Program		Date: March 2023
Appropriation/Budget Activity 0400 / 7	R-1 Program Element (Number/Name) PE 0607384BP / <i>Chemical and Biological Defense (Operational Systems Development)</i>	Project (Number/Name) IP7 / <i>Individual Protection (Op Sys Dev)</i>

new challenges supported by “buy-try-decide-acquire” acquisition strategies. SPU RCDD initiates efforts such as respiratory breathing systems, biological identification, unmanned aerial and ground platform sensor integration, development of enhanced and augmented reality systems, and modernization of protective Chemical and Biological ensembles that have gone through requirements validation, and continues product enhancement development and technology upgrades on currently fielded SOF equipment to counter emerging threats.

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2022	FY 2023	FY 2024
Title: 1) MODPROT IP Description: Upgrades, improvements, and modernizations to fielded IP systems.	7.850	-	-
Title: 2) SPU RCDD - System Modernization Description: This line includes Product Development, Test and Evaluation, and Management Services, to modernize technology across multiple commodity areas in order to rapidly field solutions in response to emergent threats.	3.809	-	-
Accomplishments/Planned Programs Subtotals	11.659	-	-

C. Other Program Funding Summary (\$ in Millions)

Line Item	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
• IP5: <i>Individual Protection (SDD)</i>	18.690	-	-	-	-	-	-	-	-	0.000	18.690
• PT7: <i>Protect (Op Sys Dev)</i>	-	20.076	26.818	-	26.818	22.815	15.490	14.193	13.612	Continuing	Continuing
• UN5: <i>Understand (SDD)</i>	-	126.071	182.726	-	182.726	137.991	127.671	108.908	68.088	Continuing	Continuing
• UN7: <i>Understand (Op Sys Dev)</i>	-	40.414	50.603	-	50.603	58.881	71.869	68.839	50.628	Continuing	Continuing
• PHM018: <i>SPU Rapid Capability Development And Demo (SPU RCDD)</i>	10.834	9.914	49.455	-	49.455	20.689	20.180	24.216	26.638	Continuing	Continuing

Remarks

D. Acquisition Strategy

MODERNIZATION PROTECTION INDIVIDUAL PROTECTION (MODPROT IP)

Modernization Protection Individual Protection (MODPROT IP) leverages mature technology from contractor developed components to address and replace obsolete components of various fielded individual protection systems. Modernization efforts will also use items developed by the Government that have transitioned from lower to higher technology readiness levels that can be inserted into fielded systems. A combination of competitive and sole source contracts to various industry vendors and project orders to various Government activities will be used to adapt previously developed components to modernize systems. Robust component and system

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Chemical and Biological Defense Program		Date: March 2023
Appropriation/Budget Activity 0400 / 7	R-1 Program Element (Number/Name) PE 0607384BP / <i>Chemical and Biological Defense (Operational Systems Development)</i>	Project (Number/Name) IP7 / <i>Individual Protection (Op Sys Dev)</i>

level testing will validate both Government and contractor furnished improvements. The improvements will be added into the specific system's updated Technical Data Package (TDP) to be used in Engineering Change Proposals (ECPs) and provided to the item managers.

SPU RAPID CAPABILITY DEVELOPMENT AND DEPLOYMENT (SPU RCDD)

The SPU RCDD overall acquisition strategy allows for rapid prototyping and testing of novel and modified COTS or GOTS systems against mission critical capabilities to enhance mission success. The SPU RCDD will use technical and functional evaluations of currently fielded items to identify materiel that requires modernization and incorporate operationally-relevant system developments. This will be accomplished through competitive contracting vehicles such as Multiple Award Indefinite Delivery Indefinite Quantify Task Order and the Countering Weapons of Mass Destruction Other Transaction Authority (CWMD OTA) for the development of prototype test assets. The SPU RCDD will use Government Agencies for prototype development, test and evaluation, and technical support.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Chemical and Biological Defense Program												Date: March 2023			
Appropriation/Budget Activity 0400 / 7						R-1 Program Element (Number/Name) PE 0607384BP / Chemical and Biological Defense (Operational Systems Development)						Project (Number/Name) IP7 / Individual Protection (Op Sys Dev)			

Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
MODPROT IP - HW C - Filter Prototypes & JSMLT Modernization	Various	Various : N/A	1.472	2.867	Nov 2021	0.000		0.000		-		0.000	0.000	4.339	0.000
SPU RCDD - HW C - EWAT Product Development	Various	MRIGlobal : Kansas City, MO	2.768	2.389	Dec 2021	0.000		0.000		-		0.000	0.000	5.157	0.000
SPU RCDD - HW S - Improved PPE Bag	C/CPFF	MRIGlobal : Kansas City, MO	-	0.127	Feb 2022	0.000		0.000		-		0.000	0.000	0.127	0.000
SPU RCDD - HW C - M-SCBA Product Development	C/CPFF	Advanced Technologies International : Summerville, SC	0.503	0.680	Mar 2022	0.000		0.000		-		0.000	0.000	1.183	0.000
Subtotal			4.743	6.063		0.000		0.000		-		0.000	0.000	10.806	N/A

Support (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
MODPROT IP - ES C - IPT, Engineering, Technical, Logistics Support	MIPR	Various : N/A	0.301	1.176	Oct 2021	0.000		0.000		-		0.000	0.000	1.477	0.000
Subtotal			0.301	1.176		0.000		0.000		-		0.000	0.000	1.477	N/A

Test and Evaluation (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
MODPROT IP - DTE C - Fixed Wing Aircraft/Aircrew PPE Optimization Effort	MIPR	Various : N/A	-	1.800	Dec 2021	0.000		0.000		-		0.000	0.000	1.800	0.000

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Chemical and Biological Defense Program **Date:** March 2023

Appropriation/Budget Activity 0400 / 7	R-1 Program Element (Number/Name) PE 0607384BP / Chemical and Biological Defense (Operational Systems Development)	Project (Number/Name) IP7 / Individual Protection (Op Sys Dev)
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Test and Evaluation (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
MODPROT IP - DTE C - Filter Prototype Testing	MIPR	U.S. Army Combat Capabilities Development Command (DEVCOM) Chemical Biological Center (CBC) : Aberdeen Proving Ground, MD	1.005	1.419	Dec 2021	0.000		0.000		-		0.000	0.000	2.424	0.000
Subtotal			1.005	3.219		0.000		0.000		-		0.000	0.000	4.224	N/A

Management Services (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
MODPROT IP - PM/MS C - Program Management Support	MIPR	Various : N/A	0.110	0.588	Jan 2022	0.000		0.000		-		0.000	0.000	0.698	0.000
SPU RCDD - PM/MS C - Program Management Support	Various	Various : N/A	1.556	0.613	Nov 2021	0.000		0.000		-		0.000	0.000	2.169	0.000
Subtotal			1.666	1.201		0.000		0.000		-		0.000	0.000	2.867	N/A

	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	7.715	11.659	0.000	0.000	-	0.000	0.000	19.374	N/A

Remarks

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Chemical and Biological Defense Program		Date: March 2023
Appropriation/Budget Activity 0400 / 7	R-1 Program Element (Number/Name) PE 0607384BP / <i>Chemical and Biological Defense (Operational Systems Development)</i>	Project (Number/Name) IP7 / <i>Individual Protection (Op Sys Dev)</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
MODPROT IP - Second Generation Filter & NIOSH DT	1	2022	4	2022
MODPROT IP - JSMLT Modernization	1	2022	4	2026
MODPROT IP - LJPACE TM Updates & LOGDEMO	1	2022	4	2022
MODPROT IP - MALO Shelf Life Extension Testing	1	2022	2	2022
MODPROT IP - Fixed Wing Aircraft/Aircrew PPE Optimization Effort	1	2023	4	2026
MODPROT IP - Maximum Age Study for JB2GU nFR Glove	2	2022	4	2022
MODPROT IP - Second Generation Filter ECP	1	2023	2	2023
MODPROT IP - CBIRF Class 3 Modernization	2	2024	4	2024
MODPROT IP - CRE PPE Modernization	2	2024	4	2024
MODPROT IP - Third Generation Filter Prototype DT	1	2025	4	2025
MODPROT IP - Third Generation Filter Technology ECP	1	2026	2	2026
SPU RCDD - Modernize CBRN Materiel	1	2022	4	2027
SPU RCDD - Develop Modular Self Contained Breathing Apparatus (MSCBA)	1	2022	4	2024
SPU RCDD - Develop Enhanced Warfighter Augmented Training (EWAT)	1	2022	4	2024
SPU RCDD - Prototype Novel CBRN Equipment	1	2022	4	2027
SPU RCDD - Develop Low Temperature Plasma Mass Spectrometer (LTPMS)	1	2022	4	2024
SPU RCDD - Develop Optimized CBRN Hydration System (OCHS)	1	2022	2	2023
SPU RCDD - Develop Assault Respirator	1	2022	4	2023
SPU RCDD - Develop USSOCOM-specific UGV/UAS Sensor Integration	1	2022	4	2023

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Chemical and Biological Defense Program **Date:** March 2023

Appropriation/Budget Activity 0400 / 7	R-1 Program Element (Number/Name) PE 0607384BP / Chemical and Biological Defense (Operational Systems Development)	Project (Number/Name) IS7 / Information Systems (Op Sys Dev)
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COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
IS7: Information Systems (Op Sys Dev)	-	14.589	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	14.589
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This Project provides for the upgrade and modernization of fielded Information Systems. During this phase efforts will execute modernization, bug fixes, provide support at fielded locations, and maintain training and logistics support. In FY2023, the CBDP RDT&E Projects have been restructured to align to the CBDP portfolio. IS7 efforts in FY2022 progress to the Understand (UN7) portfolio. This restructuring is intended to provide standardization and alignment across CBDP research, development and acquisition efforts.

Efforts included in this Project are:

- (1) Modernization Chemical Biological Radiological Nuclear Information Systems (MOD CBRN IS) **Progresses to UN7 in FY2023**

MOD CBRN IS combines CBRN IS (Cloud), Joint Effects Model (JEM), the Joint Warning and Reporting Network (JWARN) and the Software Support Activity within one portfolio. MOD CBRN IS provides for the continuous engineering and sustainment efforts to modernize capabilities and conduct Post Deployment Software Support (PDSS) to fielded CBRN software programs. Activities include: software code updates and modernization to correct deficiencies; compliance with system architectural changes to ensure interoperability; cybersecurity updates ensuring compliance with policies and standards; test and evaluation to identify possible cybersecurity vulnerabilities; configuration management; software redistribution, documentation, and training. In FY24, MOD CBRN IS funding will be consolidated under CBRN Support to Command and Control (CSC2).

B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2022	FY 2023	FY 2024
Title: 1) MOD CBRN IS	14.589	-	-
Description: CBRN Information Systems Modernization			
Accomplishments/Planned Programs Subtotals	14.589	-	-

C. Other Program Funding Summary (\$ in Millions)

<u>Line Item</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024 Base</u>	<u>FY 2024 OCO</u>	<u>FY 2024 Total</u>	<u>FY 2025</u>	<u>FY 2026</u>	<u>FY 2027</u>	<u>FY 2028</u>	<u>Cost To Complete</u>	<u>Total Cost</u>
• UN7: Understand (Op Sys Dev)	-	40.414	50.603	-	50.603	58.881	71.869	68.839	50.628	Continuing	Continuing

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Chemical and Biological Defense Program		Date: March 2023
Appropriation/Budget Activity 0400 / 7	R-1 Program Element (Number/Name) PE 0607384BP / <i>Chemical and Biological Defense (Operational Systems Development)</i>	Project (Number/Name) IS7 / <i>Information Systems (Op Sys Dev)</i>

C. Other Program Funding Summary (\$ in Millions)

Line Item	FY 2022	FY 2023	FY 2024	FY 2024	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028	Cost To	Total Cost
			Base	OCO	Total					Complete	
• JS5230: <i>Modernization CBRN Information Systems (MOD CBRN IS)</i>	0.611	0.656	-	-	-	-	-	-	-	0.000	1.267
• SA0050: <i>CBRN Support to C2 (CSC2)</i>	1.750	11.803	2.186	-	2.186	2.257	2.366	2.451	2.549	Continuing	Continuing

Remarks

D. Acquisition Strategy

MODERNIZATION CBRN INFORMATION SYSTEMS (MOD CBRN IS)

MOD CBRN IS combines CBRN IS, Joint Effects Model (JEM), Joint Warning and Reporting Network(JWARN) and the Software Support Activity under one portfolio. The acquisition strategy utilizes a managed portfolio approach to align multiple capabilities in support of modernization of CBRN Information Systems. MOD CBRN IS leverages the concepts of CBRN Hazard Awareness and Understanding and the DISA milCloud Enterprise Services to integrate current CBRN capabilities and intelligence services, applications, and systems to provide increased situational awareness and decision support to commanders for CBRN defense. This strategy provides an integration platform and supports the implementation of CSC2 and other emerging technologies from advanced technology demonstrations (ATD) and experimental capability demonstrations (ECD). MOD CBRN IS provides for the continuous engineering and modernization of fielded information systems for JEM and JWARN and Next Generation hazard prediction, warning and reporting, and CBRN decision support tool applications. MOD CBRN IS utilizes the Agile software development and IT Box to provide for the continuous spiral development, and fielding of modular capability packages. In FY23, MOD CBRN IS will transition from IS7 to UN7.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Chemical and Biological Defense Program **Date:** March 2023

Appropriation/Budget Activity 0400 / 7	R-1 Program Element (Number/Name) PE 0607384BP / Chemical and Biological Defense (Operational Systems Development)	Project (Number/Name) IS7 / Information Systems (Op Sys Dev)
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Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
MOD CBRN IS - SW S - Modernization	Various	Various : N/A	-	10.176	Oct 2021	0.000		0.000		-		0.000	0.000	10.176	0.000
Subtotal			-	10.176		0.000		0.000		-		0.000	0.000	10.176	N/A

Support (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
MOD CBRN IS - ES S - milCloud Support	MIPR	Various : N/A	-	1.977	Oct 2021	0.000		0.000		-		0.000	0.000	1.977	0.000
Subtotal			-	1.977		0.000		0.000		-		0.000	0.000	1.977	N/A

Test and Evaluation (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
MOD CBRN IS - OTH S - System Testing	MIPR	Various : N/A	-	0.803	Oct 2021	0.000		0.000		-		0.000	0.000	0.803	0.000
Subtotal			-	0.803		0.000		0.000		-		0.000	0.000	0.803	N/A

Management Services (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
MOD CBRN IS - PM/MS S - Program Management Support	Various	Various : N/A	-	1.633	Oct 2021	0.000		0.000		-		0.000	0.000	1.633	0.000
Subtotal			-	1.633		0.000		0.000		-		0.000	0.000	1.633	N/A

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Exhibit R-4, RDT&E Schedule Profile: PB 2024 Chemical and Biological Defense Program		Date: March 2023
Appropriation/Budget Activity 0400 / 7	R-1 Program Element (Number/Name) PE 0607384BP / <i>Chemical and Biological Defense (Operational Systems Development)</i>	Project (Number/Name) IS7 / <i>Information Systems (Op Sys Dev)</i>

	FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027				FY 2028			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
MOD CBRN IS - Modernization	[REDACTED]																											
MOD CBRN IS - Continuous Engineering/SW Codes Updates	[REDACTED]																											
MOD CBRN IS - Cyber Security Compliance	[REDACTED]																											
MOD CBRN IS - Operating system architecture updates	[REDACTED]																											
MOD CBRN IS - Configuration Management and Test and Evaluation	[REDACTED]																											
MOD CBRN IS - Validation, Verification and Accreditation	[REDACTED]																											

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Chemical and Biological Defense Program		Date: March 2023
Appropriation/Budget Activity 0400 / 7	R-1 Program Element (Number/Name) PE 0607384BP / <i>Chemical and Biological Defense (Operational Systems Development)</i>	Project (Number/Name) IS7 / <i>Information Systems (Op Sys Dev)</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
MOD CBRN IS - Modernization	1	2022	4	2023
MOD CBRN IS - Continuous Engineering/SW Codes Updates	1	2022	4	2023
MOD CBRN IS - Cyber Security Compliance	1	2022	4	2023
MOD CBRN IS - Operating system architecture updates	1	2022	4	2023
MOD CBRN IS - Configuration Management and Test and Evaluation	1	2022	4	2023
MOD CBRN IS - Validation, Verification and Accreditation	1	2022	4	2023

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Chemical and Biological Defense Program										Date: March 2023		
Appropriation/Budget Activity 0400 / 7					R-1 Program Element (Number/Name) PE 0607384BP / Chemical and Biological Defense (Operational Systems Development)				Project (Number/Name) MB7 / Medical Biological Defense (Op Sys Dev)			
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
MB7: Medical Biological Defense (Op Sys Dev)	-	3.726	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	3.726
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The project supports technical upgrades of fielded medical devices and systems, including diagnostic systems and nerve agent treatment systems that contribute to the layered medical defenses against biological and chemical warfare threats facing U.S. Forces on the battlefield. In FY2023, the CBDP RDT&E Projects have been restructured to align to the CBDP portfolio. MB7 efforts in FY2022 progress to the Understand (UN7) portfolio. This restructuring is intended to provide standardization and alignment across CBDP research, development and acquisition efforts.

Efforts in this Project include:

- (1) MODERNIZATION MEDICAL (MOD MED) **Progresses to UN7 in FY2023**

The MOD MED program supports improvements to fielded systems and supports post-fielding Food and Drug Administration (FDA) requirements for CBRN medical devices, including FDA-approved autoinjectors and diagnostic equipment, in order to mitigate obsolescence and maintain fielded capabilities. It exploits new and emerging FDA-compliant technologies and updated manufacturing guidelines, supports FDA-required post-marketing commitments (PMCs) and post-marketing requirements (PMRs), and continually mitigates cybersecurity risks. In FY22, MOD MED continued annual cyber security updates and management of hardware and software configurations and addressed efforts to mitigate obsolescence and maintain fielded capabilities. In FY23, MOD MED transitioned to UN7.

B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2022	FY 2023	FY 2024
Title: 1) MOD MED - Next Generation Diagnostic System (NGDS) 1	3.726	-	-
Description: Maintain Fielded Systems / Obsolescence Management			
Accomplishments/Planned Programs Subtotals	3.726	-	-

C. Other Program Funding Summary (\$ in Millions)

Line Item	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
• MC5: Medical Chemical Defense (SDD)	38.936	-	-	-	-	-	-	-	-	0.000	38.936
• MT5: Mitigate (SDD)	-	74.225	88.441	-	88.441	92.279	91.431	87.773	93.250	Continuing	Continuing

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Chemical and Biological Defense Program		Date: March 2023
Appropriation/Budget Activity 0400 / 7	R-1 Program Element (Number/Name) PE 0607384BP / <i>Chemical and Biological Defense (Operational Systems Development)</i>	Project (Number/Name) MB7 / <i>Medical Biological Defense (Op Sys Dev)</i>

C. Other Program Funding Summary (\$ in Millions)

<u>Line Item</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u> <u>Base</u>	<u>FY 2024</u> <u>OCO</u>	<u>FY 2024</u> <u>Total</u>	<u>FY 2025</u>	<u>FY 2026</u>	<u>FY 2027</u>	<u>FY 2028</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
• UN7: <i>Understand (Op Sys Dev)</i>	-	40.414	50.603	-	50.603	58.881	71.869	68.839	50.628	Continuing	Continuing

Remarks

D. Acquisition Strategy

MODERNIZATION MEDICAL (MOD MED)

MOD MED ensures system upgrades for both hardware and software track to latest updates, including cybersecurity, for the commercial devices from the original equipment manufacturer. MOD MED will also fund development of additional assays (i.e. tests), for fielded systems, to address emerging biological threats and diseases. MOD MED leverages an existing Indefinite Delivery/Indefinite Quantity (IDIQ) Delivery Order contract for required system upgrades and assay development.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Chemical and Biological Defense Program **Date:** March 2023

Appropriation/Budget Activity 0400 / 7	R-1 Program Element (Number/Name) PE 0607384BP / Chemical and Biological Defense (Operational Systems Development)	Project (Number/Name) MB7 / Medical Biological Defense (Op Sys Dev)
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Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
MOD MED - Product Management	Various	Various : N/A	-	1.264	Dec 2021	0.000		0.000		-		0.000	0.000	1.264	0.000
MOD MED - HW C - Next Generation Diagnostic System 1 (NGDS 1)	C/CPFF	BioFire Diagnostics : Salt Lake City, UT	-	2.036	Jan 2022	0.000		0.000		-		0.000	0.000	2.036	0.000
Subtotal			-	3.300		0.000		0.000		-		0.000	0.000	3.300	N/A

Support (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
MOD MED - ES S - NGDS 1 - Technical Support	C/CPFF	Battelle Memorial Institute : Aberdeen, MD	-	0.095	May 2022	0.000		0.000		-		0.000	0.000	0.095	0.000
Subtotal			-	0.095		0.000		0.000		-		0.000	0.000	0.095	N/A

Management Services (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
MOD MED - PM/MS C - Management Services	Various	Various : N/A	-	0.331	Feb 2022	0.000		0.000		-		0.000	0.000	0.331	0.000
Subtotal			-	0.331		0.000		0.000		-		0.000	0.000	0.331	N/A

	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract	
Project Cost Totals		-	3.726	0.000	0.000	0.000	-	0.000	3.726	N/A

Remarks

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Chemical and Biological Defense Program		Date: March 2023
Appropriation/Budget Activity 0400 / 7	R-1 Program Element (Number/Name) PE 0607384BP / <i>Chemical and Biological Defense (Operational Systems Development)</i>	Project (Number/Name) MB7 / <i>Medical Biological Defense (Op Sys Dev)</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
MOD MED - Diagnostic System Upgrades / Assay Development	1	2023	4	2028
MOD MED - NGDS 1 Tech Refresh	4	2023	4	2028
MOD MED - Autoinjector Post Marketing Commitments and Requirements (PMRs/ PMCs)	1	2023	4	2028

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Chemical and Biological Defense Program **Date:** March 2023

Appropriation/Budget Activity 0400 / 7	R-1 Program Element (Number/Name) PE 0607384BP / <i>Chemical and Biological Defense (Operational Systems Development)</i>	Project (Number/Name) MC7 / <i>Medical Chemical Defense (Op Sys Dev)</i>
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COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
MC7: <i>Medical Chemical Defense (Op Sys Dev)</i>	-	1.013	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.013
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This project provides for the upgrade and modernization of fielded medical nerve agent treatment system that contribute to the layered medical defenses against chemical warfare agent threats facing U.S. Forces in the field. In FY2023, the CBDP RDT&E Projects have been restructured to align to the CBDP portfolio. MC7 efforts in FY2022 progress to the Mitigate (MT7) portfolio. This restructuring is intended to provide standardization and alignment across CBDP research, development and acquisition efforts.

The effort included in this Project is:

- (1) Improved Nerve Agent Treatment System Centrally Acting (INATS CA) **Progresses to MT7 in FY2023**

B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2022	FY 2023	FY 2024
Title: 1) INATS CA	0.800	-	-
Description: Pyridostigmine Bromide (PB) Extended Release Tablet Development			
Title: 2) INATS CA	0.213	-	-
Description: SNAPP Shelf Life Modernization: Studies required by the FDA and/or users to modernize or upgrade medical chemical defense countermeasures.			
Accomplishments/Planned Programs Subtotals			1.013

C. Other Program Funding Summary (\$ in Millions)

Line Item	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
• MC5: <i>Medical Chemical Defense (SDD)</i>	38.936	-	-	-	-	-	-	-	-	0.000	38.936
• MT5: <i>Mitigate (SDD)</i>	-	74.225	88.441	-	88.441	92.279	91.431	87.773	93.250	Continuing	Continuing
• MT7: <i>Mitigate (Op Sys Dev)</i>	-	5.098	3.074	-	3.074	1.987	1.819	1.845	1.862	Continuing	Continuing

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Chemical and Biological Defense Program		Date: March 2023
Appropriation/Budget Activity 0400 / 7	R-1 Program Element (Number/Name) PE 0607384BP / <i>Chemical and Biological Defense (Operational Systems Development)</i>	Project (Number/Name) MC7 / <i>Medical Chemical Defense (Op Sys Dev)</i>

C. Other Program Funding Summary (\$ in Millions)

<u>Line Item</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u> <u>Base</u>	<u>FY 2024</u> <u>OCO</u>	<u>FY 2024</u> <u>Total</u>	<u>FY 2025</u>	<u>FY 2026</u>	<u>FY 2027</u>	<u>FY 2028</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
• PHM040: <i>Improved Nerve Agent Treatment Centrally Acting (INATS CA)</i>	-	-	-	-	-	-	-	6.511	33.883	Continuing	Continuing

Remarks

D. Acquisition Strategy

IMPROVED NERVE AGENT TREATMENT CENTRALLY ACTING (INATS CA)

For scopolamine autoinjector development INATS CA uses contracts and Other Transactional Agreements (OTAs) in which the performer shall be responsible for conducting development and testing activities consistent with current FDA regulations. The contractor shall sponsor the combination product to the FDA and hold all approvals and/or licenses. Upon FDA approval, a follow-on procurement agreement will be used to procure initial operational capability (IOC) / full operational capability (FOC).

The pyridostigmine bromide (PB) modernization effort will utilize OTAs for conducting development and testing activities to generate data to submit to the FDA.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Chemical and Biological Defense Program **Date:** March 2023

Appropriation/Budget Activity 0400 / 7	R-1 Program Element (Number/Name) PE 0607384BP / Chemical and Biological Defense (Operational Systems Development)	Project (Number/Name) MC7 / Medical Chemical Defense (Op Sys Dev)
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Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
INATS CA - Shelf Life Modernization (SNAPP)	C/CPFF	CMC Pharma : Cleveland, OH	0.449	0.196	Jun 2022	0.000		0.000		-		0.000	0.000	0.645	0.000
INATS CA - HW C - PB Extended Release	C/FFP	Amneal Pharmaceuticals : Hauppauge, NY	1.179	0.737	Nov 2021	0.000		0.000		-		0.000	0.000	1.916	0.000
Subtotal			1.628	0.933		0.000		0.000		-		0.000	0.000	2.561	N/A

Management Services (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
INATS CA - Management Services	Various	JPEO Chem, Bio, Rad, and Nuc Defense (JPEO-CBRND) : Aberdeen Proving Ground, MD	0.126	0.080	Dec 2021	0.000		0.000		-		0.000	0.000	0.206	0.000
Subtotal			0.126	0.080		0.000		0.000		-		0.000	0.000	0.206	N/A

			Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			1.754	1.013	0.000	0.000	-	0.000	0.000	2.767	N/A

Remarks

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Exhibit R-4, RDT&E Schedule Profile: PB 2024 Chemical and Biological Defense Program		Date: March 2023
Appropriation/Budget Activity 0400 / 7	R-1 Program Element (Number/Name) PE 0607384BP / <i>Chemical and Biological Defense (Operational Systems Development)</i>	Project (Number/Name) MC7 / <i>Medical Chemical Defense (Op Sys Dev)</i>

	FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027				FY 2028			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
INATS CA - MS B-Milestone B																												
INATS CA - Clinical Trials																												
INATS CA - Manufacturing/Auto-Injector																												
INATS CA - Non-Clinical Studies																												
INATS CA - NDA Submission-New Drug Application Submission																												
INATS CA - FDA Approval-Food and Drug Administration Approval																												
INATS CA - SNAPP Modernization - BA7																												
INATS CA - PB Extended Release Tablet Development - BA7																												

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Chemical and Biological Defense Program		Date: March 2023
Appropriation/Budget Activity 0400 / 7	R-1 Program Element (Number/Name) PE 0607384BP / <i>Chemical and Biological Defense (Operational Systems Development)</i>	Project (Number/Name) MC7 / <i>Medical Chemical Defense (Op Sys Dev)</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
INATS CA - MS B-Milestone B	2	2022	2	2022
INATS CA - Clinical Trials	1	2022	4	2024
INATS CA - Manufacturing/Auto-Injector	1	2022	2	2025
INATS CA - Non-Clinical Studies	1	2022	2	2025
INATS CA - NDA Submission-New Drug Application Submission	1	2026	3	2026
INATS CA - FDA Approval-Food and Drug Administration Approval	3	2026	1	2028
INATS CA - SNAPP Modernization - BA7	1	2022	4	2025
INATS CA - PB Extended Release Tablet Development - BA7	1	2023	1	2026

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