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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Defense Threat Reduction Agency **Date:** April 2022

Appropriation/Budget Activity 0400: <i>Research, Development, Test & Evaluation, Defense-Wide I BA 2: Applied Research</i>	R-1 Program Element (Number/Name) PE 0602718BR / <i>Counter Weapons of Mass Destruction Applied Research</i>
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COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
Total Program Element	756.569	159.004	197.011	192.162	0.000	192.162	205.414	208.558	203.879	200.236	Continuing	Continuing
RA: <i>CWMD Cross-Cutting Technical and Information Sciences</i>	346.681	36.288	48.112	32.670	0.000	32.670	39.918	40.914	32.639	33.543	Continuing	Continuing
RD: <i>Nuclear Technologies and Capabilities Development</i>	145.646	83.538	101.229	106.095	0.000	106.095	110.854	112.082	114.321	111.359	Continuing	Continuing
RG: <i>Counter WMD Technologies and Capabilities Development</i>	134.528	20.752	29.359	30.277	0.000	30.277	30.871	31.589	32.220	31.788	Continuing	Continuing
RR: <i>CWMD Test and Evaluation</i>	129.714	18.426	18.311	23.120	0.000	23.120	23.771	23.973	24.699	23.546	Continuing	Continuing

A. Mission Description and Budget Item Justification

The Defense Threat Reduction Agency (DTRA) Counter Weapons of Mass Destruction (CWMD) Applied Research program element funds the application and advancement of basic scientific knowledge to develop novel materials, devices, systems, and methods supporting next generation concepts and technologies, to include advances in Weapons of Mass Destruction (WMD) surveillance, detection, defeat, prevention, nonproliferation, counter proliferation, consequence management, and treaty verification.

This Applied Research portfolio is aligned with strategic planning objectives and Science and Technology (S&T) investment direction established annually by DTRA, which directly support policy and planning guidance from the Executive Office of the President, the Department of Defense (DoD), and the broader WMD threat reduction community.

The portfolio advances DTRA's CWMD mission by balancing the following: invest in DTRA's applied research capabilities and increase the CWMD technology base to maximize future pay-off; capitalize on opportunities to deliver innovative, cost-effective solutions to technical challenges that must be resolved prior to system-specific technology investigations and development; and ensure applied research efforts are directly aligned to the mission-specific capability requirements of DTRA, the Military Departments, Combatant Commanders, other DoD and federal agencies, and international partners.

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B. Program Change Summary (\$ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Previous President's Budget	174.221	197.011	0.000	0.000	0.000
Current President's Budget	159.004	197.011	192.162	0.000	192.162
Total Adjustments	-15.217	0.000	192.162	0.000	192.162
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-10.618	-			
• SBIR/STTR Transfer	-4.599	-			
• Adjustments to Budget Year	0.000	0.000	192.162	0.000	192.162

Change Summary Explanation

FY 2023 funds increase because the FY 2022 President's Budget request did not include out-year funding. In FY 2021, DTRA reprogrammed funding for higher Departmental priorities.

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Appropriation/Budget Activity 0400 / 2					R-1 Program Element (Number/Name) PE 0602718BR / <i>Counter Weapons of Mass Destruction Applied Research</i>				Project (Number/Name) RA / <i>CWMD Cross-Cutting Technical and Information Sciences</i>			
COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
RA: <i>CWMD Cross-Cutting Technical and Information Sciences</i>	346.681	36.288	48.112	32.670	0.000	32.670	39.918	40.914	32.639	33.543	Continuing	Continuing

A. Mission Description and Budget Item Justification

The CWMD Cross-Cutting Technical and Information Sciences project develops concepts and technologies in the areas of high-speed information processing, modeling and simulation, signal detection, and data-driven decision analysis in support of the Defense Threat Reduction Agency's (DTRA's) technical reach-back teams. This project develops and maintains continuously improving collaborative architectures and Weapons of Mass Destruction (WMD) modeling and simulation codes that drive an integrated suite of decision support tools serving the Combatant Commands, other Department of Defense (DoD) agencies, and national and international Countering WMD (CWMD) partners. This effort also funds research activities that benefit the public through analysis and engagement to reduce and counter threats posed by WMD via the Strategic Trends Research Initiative (STRI). STRI cultivates national and international research community partnerships across domains, bringing scientific, technical, and social science experts together to help understand and anticipate WMD capabilities and threats.

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

	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Title: RA: CWMD Cross-Cutting Technical and Information Sciences	36.288	48.112	32.670	0.000	32.670
Description: Project RA develops concepts and technologies in the areas of high-speed information processing, modeling and simulation, signal detection, and data-driven decision analysis.					
FY 2022 Plans:					
- Develop and sustain advanced information technology capabilities enabling CWMD situational understanding and leverage advanced data science techniques to improve threat analysis to better inform operational planning.					
- Transition new data science solutions to improve real-time threat analysis into regular operational use.					
- Leverage non-traditional acquisition means to develop and deliver technical capabilities responsive to urgent, emergent theater requirements in support of critical strategic partners.					
- Deliver timely technical capabilities in response to Combatant Command (CCMD) emergent needs that would otherwise not be met in the required timeline.					
- Provide integrated support for effective transition to advanced development partners by leveraging an overarching assessment approach to capability development efforts to identify promising efforts for potential transition, will improve transition effectiveness rate.					
- Assist in transition of additional projects that may otherwise not transition effectively to a sustainable partnership.					

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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
<ul style="list-style-type: none"> - Utilize new and emergent advanced modeling and simulation tools and development activities to develop two integrated CWMD modeling capabilities to support in theater operational planning. - Generate timely and actionable recommendations on mitigation of anticipated future challenges based upon assessment/analysis of foreign and domestic Chemical, Biological, Radiological, Nuclear, and High-Yield Explosives (CBRNE) trends. - Develop timely and relevant table top exercises and refine strategic dialogues/symposia/fora to accommodate year-upon-year learning and advancement on anticipated future battlespace challenges. - Refine strategic research projects to improve tangible outcomes and achievable recommendations for future activities to counter WMD development and use. - Continue developing quarterly updates to forecasted changes/developments in geopolitical landscapes and the intersection of CBRNE and WMD employment systems. - Leverage CBRNE community resources to provide in-depth and expert analysis to current and future WMD problem sets. <p><i>FY 2023 Base Plans:</i></p> <ul style="list-style-type: none"> - Develop new and emergent advanced modeling and simulation tools, applications and other development activities to develop two, and deliver one new, integrated CWMD modeling capabilities to support in theater operational planning. - Develop analytics using machine and deep learning to provide geospatial prediction analysis and behavior variance for CWMD pattern-of-life analysis. - Develop processing algorithms using artificial intelligence and machine learning to tip and cue analysts for CWMD threat network analysis. - Provide strategic, urgent Counter-Threat capability development for urgent and emergent theater needs, with focus on detector and sensor design, data analysis and storage, search capabilities, defeat pathways, and continuous test site technical advancement. - Develop data integration, analysis and visualization solutions in support of CCMDs, Special Operations Forces, and other mission partners. Incorporate new technologies to increase the scalability, reusability, and transferability of data science capabilities developed across commands/units supported. - Apply advanced analytics to develop novel capabilities for illuminating and disrupting procurement and proliferation networks and coordinating CWMD operations. Will transition at least two operational prototypes to supported commands/units or advanced developers. 					

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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
- Conduct studies and table-top exercises to understand and explore the Chemical Biological Radiological and Nuclear spectrum and enabling technology challenges facing our warfighters in the next five to ten years.					
<i>FY 2023 OCO Plans:</i> N/A					
<i>FY 2022 to FY 2023 Increase/Decrease Statement:</i> The decrease from FY 2022 to FY 2023 is due to the net impact of 1) the realignment of resources to PE 0603160BR in Project RR for a) data architecture signatures technology development to locate, identify, and track special nuclear materials and b) necessary upgrades to national test bed capabilities, 2) a realignment to O&M to fund expert dialogues with specialists at universities for global futures strategic planning, and 3) realignments from quick reaction capabilities to better align investments to National, Departmental, and Agency level strategic guidance.					
Accomplishments/Planned Programs Subtotals	36.288	48.112	32.670	0.000	32.670

C. Other Program Funding Summary (\$ in Millions)											
Line Item	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
• 13/0602134BR: <i>Improvised Threat Reduction Applied Research</i>	2.449	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.449
• 34/0603160BR: <i>Counter Weapons of Mass Destruction Advanced Technology Development</i>	50.959	84.660	78.991	0.000	78.991	84.775	86.706	84.214	84.684	Continuing	Continuing
• 98/0604134BR: <i>Counter Improvised- Threat Technology Demonstration, Prototype Development and Testing</i>	6.833	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	6.833
• 105/0604551BR: <i>Catapult</i>	0.000	7.166	7.130	0.000	7.130	7.328	7.475	7.625	7.777	Continuing	Continuing
• 159/0605502BR: <i>Small Business Innovation Research</i>	14.241	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	14.241

Remarks

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D. Acquisition Strategy

Competitive selection of most appropriate performers to fulfill science and technology development needs.

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Appropriation/Budget Activity 0400 / 2					R-1 Program Element (Number/Name) PE 0602718BR / <i>Counter Weapons of Mass Destruction Applied Research</i>				Project (Number/Name) RD / <i>Nuclear Technologies and Capabilities Development</i>			
COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
RD: <i>Nuclear Technologies and Capabilities Development</i>	145.646	83.538	101.229	106.095	0.000	106.095	110.854	112.082	114.321	111.359	Continuing	Continuing

A. Mission Description and Budget Item Justification

Nuclear Technologies and Capabilities Development encompasses the following related areas:

Research, development, test, and evaluation (RDT&E) to identify, develop, and exploit signatures associated with nuclear threats in support of U.S. capabilities that detect and interdict such threats; and locate, identify, and track special nuclear material and improve detection factors such as range, time, sensitivity, and accuracy to enhance Service and Special Mission Unit capabilities. These efforts support Department of Defense (DoD) requirements for countering terrorism, counterproliferation, nonproliferation, countering rogue states, and homeland defense.

RDT&E to systematically study signatures associated with adversary nuclear programs and nuclear detonations to gain knowledge or understanding necessary to: determine technical capabilities needed to improve DoD contingency planning activities; improve DoD situational awareness on the nuclear battlefield; and improve capabilities to attribute the source of a nuclear detonation.

Research and develop innovative technologies for the protection of mission-essential personnel, critical military and national defense capabilities, and associated control and support systems during a nuclear event. Research under this project supports the mission critical systems identified under DoD Instruction 3150.09, Chemical, Biological, Radiological, and Nuclear Survivability Policy. System vulnerability research develops nuclear assessment capabilities to support operational planning, weapons effects predictions, and strategic system design. This activity also provides the DoD's nuclear design and protection standards for new and existing systems, e.g., command and control facilities and aircraft. Key systems include the Nuclear Command and Control System, the net-centric thin-line, and both military and civilian satellites and associated support systems. Experimental capabilities research provides the warfighter with unique x-ray, gamma ray, and electromagnetic pulse (EMP) test capabilities in support of system survivability development, certification, and sustainment. These efforts also support international collaboration, user groups, case study reviews, and the Joint Atomic Information Exchange Group. The human survivability effort conducts research to develop and validate mortality and morbidity models associated with radiological and nuclear weapon effects.

Research and development modeling tools to support military operational planning, weapons effects predictions, and strategic system design decisions; consolidate validated modeling tools for integrated functionality; predict system responses to nuclear and radiological weapons producing electromagnetic, thermal, blast, shock, and radiation environments; provide detailed adversary nuclear infrastructure characterization to enhance counterforce operations and hazard effects; and, develop foreign nuclear weapon outputs.

Delivers integrated applications, data analysis, and cloud-ready AI-enhanced capabilities, cross-cutting platform supporting full spectrum of nuclear operations, wargaming, and assessments. Provides timely electronic access to Nuclear Testing Archives supporting validation of the effectiveness of the Nuclear Deterrent and survivability of US military assets without a return to nuclear testing.

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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
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<p>Title: RD: Nuclear Technologies and Capabilities Development</p> <p>Description: Project RD develops direct and indirect technologies for the detection of radiation and non-radiative signatures associated with nuclear threats, and advances warfighter capabilities to rapidly locate, characterize, and counter such threats.</p> <p>FY 2022 Plans:</p> <ul style="list-style-type: none"> - Sponsor/host one trial nuclear wargame with current Mission Impact of Nuclear Effects Software (MINES) capabilities; advance nuclear wargaming research to include other nuclear weapon effects and incorporate into MINES development. - Develop prototype sensors using novel materials (e.g. CLLBC (Cs₂LiLa(Br,Cl)₆:Ce, Dual-sided micro-structured semiconductor neutron detectors (DSMSNDs)) for evaluation of military applications. - Develop improved nuclear weapons outputs models that correctly account for radioactive debris, improving estimates of fallout-induced casualties and impacts on space and missile forces. - Develop improved nuclear weapons induced fire ignition models that correctly account for thick fuels, improving estimates of battle and collateral damages from nuclear plans. - Conduct tests at the U.S. Army White Sands Missile Range (WSMR) Large Blast Thermal Simulator (LBTS) to quantify combined airblast and thermal effects, improving estimates of impacts to ground maneuver forces operating on a nuclear battlefield. - Integrate toolsets in cloud platform for nuclear planning, Nuclear, Chemical, Biological, Radiological, and High-Yield Explosive (NCBRE) assessments, and advanced analytics in support of Service and Combatant Command planning and assessments and Conventional Nuclear Integration situational awareness - includes tool development to synthesize necessary modeling data for tool sets. - Provide integration support for nuclear technology programs; support international activities, user groups, nuclear survivability program, and case study reviews. Also utilizes the Nuclear Science and Engineering Research Center to leverage DoD Degree Granting Institutions to develop new capabilities and advance DTRA's mission to support the warfighter. - Publish updates to nuclear survivability military standards for aircraft, ships, missiles and interceptor. - Support nuclear modernization through the certification of strategic materials and the upgrade of nuclear effects testing and diagnostics. - Provide nuclear survivability operational support through analyses, vulnerability assessments, and the review of mission critical systems. 	83.538	101.229	106.095	0.000	106.095
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B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
<p>- Deliver enhanced cloud platform with integrated toolsets for nuclear planning, Nuclear, Chemical, Biological, Radiological, and high Explosive (NCBRE) assessments, and advanced analytics for warfighter and Conventional-Nuclear Integration (CNI) situational awareness.</p> <p>- Deliver integrated improved nuclear physics and effects model in theater nuclear planning tool, improving accuracy of nuclear planning capability for US Army and Combatant Commands (CCMDs).</p> <p>- Provide advanced search and discovery Artificial intelligence/Machine Learning (AI/ML) algorithms for improved media retrieval capability documents (20%), photographs (2%), and films (.5%), enabling nuclear survivability and effects programs with higher fidelity data.</p> <p>FY 2023 Base Plans:</p> <p>- Conduct technical demonstration of radiological-nuclear (RN) Virtual Reality/Augmented Reality (VR/AR) capabilities.</p> <p>- Investigate autonomous operations and swarming applications for radiation sensors on unmanned platforms.</p> <p>- Mature advanced search and discovery (ASD) of archived nuclear documents using AI/ML algorithms to support increased user portal retrieval capability of information from documents (25%), photographs (10%), and films (2%) to enable nuclear survivability and effects algorithm programs with higher fidelity data.</p> <p>- Enhance Nuclear, Chemical, Biological, Radiological, High Explosives (NCBRE) Artificial Intelligence/Machine Learning Environment (NAIMLE) data curation and operability specific to RN data types; integration of container development between working data models related to nuclear missions</p> <p>- Integrate 3D effects model supporting aviation assets in theater nuclear planning tool to improve nuclear planning capability for US Army and CCMDs.</p> <p>- Deliver tools for visualization of data feeds to meet warfighter needs and for sharing data with foreign partners (Supporting Nuclear Enterprise Threat Characterization and Nuclear Enterprise Threat Isolation).</p> <p>- Facilitate three nuclear war-games design and operation with Mission Impacts of Nuclear Events (MINES); Support five DoD nuclear war-games & exercises design and operation with SME, existing tools, and MINES capabilities; Sponsor/host two nuclear war-games with updated MINES capabilities.</p> <p>- Initiate x-ray development to optimize key performance parameters on new Quad Eagle Simulator; enable growth and continued availability of DTRA's capabilities.</p> <p>- Develop EMP Planning Tools (Electromagnetic Reliability & Effects Prediction (EMREP) v9, STRATCOM Support equipment, Nuclear Battlefield Test Support).</p>					

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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
- Conduct EMP modular expansion and data demonstration, scintillation Hardware-in-the-Loop (HWIL) production/certification demonstrations, modeling and experimentation to characterize dose rate, and neutron effects. FY 2023 OCO Plans: N/A FY 2022 to FY 2023 Increase/Decrease Statement: The increase from FY 2022 to FY 2023 is primarily for increased investment in nuclear survivability. This increase will fund new Combatant Command Electromagnetic Pulse (EMP) testing requirements for various battlefield systems, surface vessels, and aircraft.					
Accomplishments/Planned Programs Subtotals	83.538	101.229	106.095	0.000	106.095

C. Other Program Funding Summary (\$ in Millions)											
Line Item	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
• 34/0603160BR/RD: <i>Counter Weapons of Mass Destruction Advanced Technology Development</i>	46.587	54.417	60.249	0.000	60.249	59.722	61.765	62.800	63.855	Continuing	Continuing
• 129/0605000BR/RD: <i>Counter Weapons of Mass Destruction Systems Development</i>	15.250	14.063	14.403	0.000	14.403	13.414	13.381	13.649	13.922	Continuing	Continuing

Remarks

D. Acquisition Strategy

Competitive selection of most appropriate performers to fulfill science and technology development needs.

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COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
RG: Counter WMD Technologies and Capabilities Development	134.528	20.752	29.359	30.277	0.000	30.277	30.871	31.589	32.220	31.788	Continuing	Continuing

A. Mission Description and Budget Item Justification

Counter WMD Technologies and Capabilities Development encompasses the following areas.

Defeat Technologies program develops innovative kinetic and non-kinetic weapon technologies to expand traditional and asymmetric options available to Combatant Commanders to deny, disrupt, and defeat adversarial use of WMD, while minimizing collateral effects. Technology development focuses on the physical or functional defeat of WMD threat materials, an adversary's ability to deliver the same, and the physical and nonphysical support networks enabling both. It does so through the systematic identification and maturation of technologies capable of defeating WMD agents or agent-based processes and selecting technologies for integration into weapons, delivery systems, or rapid WMD elimination capabilities. This effort includes developing specific WMD agent/agent-based process simulants, sub-scale test infrastructure, and sampling capability required for effective development, testing, and evaluation of next-generation CWMD capabilities. The project places a high priority on understanding, characterizing, and validating potential weapon effects within mathematical confidence as it relates to the unintended release of hazardous threat materials. Technologies with the potential for weapon and capability integration are transitioned to Budget Activity (BA) 3, Advanced Technology Development (ATD) efforts. On a limited basis, technology test data is shared with coalition partners.

WMD counterforce technologies research develops weapons effects modeling algorithms, full and sub-scale test series required to investigate CWMD weapon effects and sensor performance, and visualization and situational awareness tools to support the next generation Technical Reachback cell. These activities are critical enablers for the development of advanced CWMD planning tools. Energetics research develops materials and weapon design technology providing defeat capabilities for engaging hard and deeply buried targets that are beyond current high explosive blast/fragmentation warhead technology.

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

	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Title: RG: Counter WMD Technologies and Capabilities Development	20.752	29.359	30.277	0.000	30.277
Description: Project RG develops innovative kinetic and non-kinetic weapons technologies to expand traditional and asymmetric options available to Combatant Commanders to deny, disrupt, and defeat adversarial use of WMD while minimizing collateral effects.					
FY 2022 Plans:					
- Initiate Next Generation Access Denial capability based on studies conducted in FY 2021.					
- Develop and transition next generation agent defeat capabilities utilizing enhanced energetics, advanced manufacturing techniques and tactics that improve performance and lethality and reduce production time and cost.					

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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
<ul style="list-style-type: none"> - Complete Coalition Warfare Program-Autonomous Tunnel Exploitation with RoK. - Explore operationalizing nontraditional data; Transition WMDpedia. - Complete independent review of forecasting tactics, techniques, and procedures (TTPs), improve regional assessments, validate effectiveness of forecasting TTPs. - Program, plan, and manage Explosive Ordnance Disposal (EOD) diagnostics and defeat projects and deliver technologies. - Program, plan, and manage low-visibility and breaching projects and deliver technologies. - Provide Systems Engineering and Integration support for both internal DTRA programs and provide subject matter expertise to external organizations with efforts related to CWMD and hard and deeply buried target (HDBT) defeat. - Support Combatant Command (CCMD) operational planning activities while identifying warfighting capability gaps. - Deliver Targeting Recommendation Packages and conduct training activities as requested by the CCMDs. - Support weapons effects testing programs and weapons development activities. <p><i>FY 2023 Base Plans:</i></p> <ul style="list-style-type: none"> - Develop, test, and evaluate specialized capabilities to protect against and defeat WMD through diagnostics and characterization of Agent Defeat Modeling and Simulation Modeling (ADMB). - Conduct lab-scale tests and large/full-scale test event to validate source term prediction capabilities for ADMB. - Conduct small and mid-scale tests to verify weapons effects phenomenology (WEP) models (e.g. over-burial and penetration). - Begin to explore a Cloud Based Solution transition and continue multi-dimensional upgrades into the Vulnerability Assessment and Protection Option (VAPO) Platform. - Complete partnership with U. S. Army Engineer Research and Development Center (ERDC) and the United Kingdom (UK) to deliver a VAPO capability allowing end users to perform an assessment of aerial delivered threats and weapons. - Initiate combined effects model development with completion of Hi-Fi calculations. - Explore existing Artificial Intelligence/Machine Learning (AI/ML) advancements for weapons effects phenomenology RDT&E application. - Program, plan, and manage Explosive Ordnance Disposal (EOD) diagnostics and defeat projects and deliver technologies. - Program, plan, and manage low-visibility and breaching projects and deliver technologies. 					

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

	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
- Provide Systems Engineering and Integration support for internal DTRA programs and provide subject matter expertise to external organizations with efforts related to CWMD and hard and deeply buried target (HDBT) defeat.					
- Deliver Targeting Recommendation Packages and conduct training activities as requested by the CCMDs.					
- Support weapons effects testing programs and weapons development activities in support of Combatant Command CWMD requirements.					
FY 2023 OCO Plans: N/A					
FY 2022 to FY 2023 Increase/Decrease Statement: The increase from FY 2022 to FY 2023 is mostly due to inflation and a slight investment increase in CWMD Hard Target Defeat (HTD) Weapons Technologies development activities.					
Accomplishments/Planned Programs Subtotals	20.752	29.359	30.277	0.000	30.277

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

<u>Line Item</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023 Base</u>	<u>FY 2023 OCO</u>	<u>FY 2023 Total</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>FY 2026</u>	<u>FY 2027</u>	<u>Cost To Complete</u>	<u>Total Cost</u>
• 34/0603160BR/RG: <i>Counter Weapons of Mass Destruction Advanced Technology Development</i>	233.769	266.262	246.951	0.000	246.951	253.002	258.835	262.652	258.335	Continuing	Continuing
Remarks											

D. Acquisition Strategy

Competitive selection of most appropriate performers to fulfill science and technology development needs.

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Defense Threat Reduction Agency										Date: April 2022		
Appropriation/Budget Activity 0400 / 2					R-1 Program Element (Number/Name) PE 0602718BR / Counter Weapons of Mass Destruction Applied Research				Project (Number/Name) RR / CWMD Test and Evaluation			
COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
RR: CWMD Test and Evaluation	129.714	18.426	18.311	23.120	0.000	23.120	23.771	23.973	24.699	23.546	Continuing	Continuing

A. Mission Description and Budget Item Justification

The Countering WMD Test and Evaluation project provides a unique national test capability for simulated WMD facilities and processes. This capability provides structured and systematic end-to-end test event planning, preparation, management, execution, and data analysis. It also offers test instrumentation (data acquisition systems and optics), scientific analysis and predictions, test article construction, test article/test bed remediation, tunnel mining, architectural and engineering design, systems engineering and integration, and test data management. The project leverages 50 years of expertise in investigating weapons effects and target response across the spectrum of hostile environments that could be created by proliferate nations or terrorist organizations with access to advanced conventional weapons or WMD. Subject matter experts design full and sub-scale testing strategies focusing on weapon-target interaction with fixed soft and hardened facilities to include above ground facilities, cut-and-cover facilities, and deep underground tunnels. This capability does not exist anywhere else within the DoD and supports the counterproliferation pillar of the National Strategy to Counter WMD.

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

Title: RR: Countering WMD Test and Evaluation

Description: Project RR provides a unique national test bed capability for the study of weapon-target interaction, simulated WMD facility characterization and defeat testing, and evaluation of asymmetric threats observed in theater, to evaluate the implications of WMD and other special weapon use against U.S. military and civilian assets. Additionally, Project RR develops instrumentation and identifies unique threat signatures that can support early detection and development of countermeasures to support Combatant Command needs.

FY 2022 Plans:

- Continue to modernize and evolve instrumentation and diagnostics capability to support test and evaluation activities across the WMD spectrum, as well as develop new methods to address the evolving threats
- Replicate, test, and evaluate identified threat WMD systems and use tactics, techniques, and procedures to support the development of WMD detection, characterization, and countermeasures documented in CCMD requirements.
- Perform threat-relevant test and evaluation activities to document unique signatures that identify, characterize, and determine the effectiveness of defeat techniques for WMD proliferation and production facilities, leveraging the Nevada National Security Site, as well as a novel transportable capability that can replicate specific threats of interest to the CCMDs.

FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
18.426	18.311	23.120	0.000	23.120

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

	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
<ul style="list-style-type: none"> - Design and build testbeds in small-, mid-, and large-scale environments capable of capturing data needed to improve and validate high-fidelity modeling and simulation tools used to predict US weapon and adversary threat effects on facilities of interest. - Employ the capability developed in FY2021 to support the characterization and evaluation of observed automated and autonomous threat systems with WMD elements, and demonstrate progress in the development of algorithms to support the early detection and countermeasures development. - Complete the development of the data architecture, transportable data collection system, and portals to enable data acquisition for all DTRA research and development activities, and the interagency sharing of data at multiple classification levels. - Demonstrate advancement in data analysis techniques, data analytics, and signature-based algorithms to support the development of deliverable tools to the combatant commands. <p>FY 2023 Base Plans:</p> <ul style="list-style-type: none"> - Modernize and evolve instrumentation and diagnostics capability to support test and evaluation activities across the CWMD spectrum, as well as develop new methods to address the evolving threats. - Remediate and restore existing test bed articles to continue support across the CWMD spectrum. - Replicate, test, and evaluate identified threat WMD systems and use tactics, techniques, and procedures to support the development of WMD detection, characterization, and countermeasures documented in CCMD requirements. - Perform threat-relevant test and evaluation activities to document unique signatures that identify, characterize, and determine the effectiveness of defeat techniques for WMD proliferation and production facilities, leveraging the Nevada National Security Site, as well as a novel transportable capability that can replicate specific threats of interest to the CCMDs. - Design and build testbeds in small-, mid-, and large-scale environments capable of capturing data needed to improve and validate high-fidelity modeling and simulation tools used to predict US weapon and adversary threat effects on facilities of interest. - Maintain ability to execute RDT&E testing at Kirtland AFB, the White Sands Missile Range (WSMR), and the Nevada National Security Site. <p>FY 2023 OCO Plans: N/A</p> <p>FY 2022 to FY 2023 Increase/Decrease Statement:</p>					

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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
The increase from FY 2022 to FY 2023 funds necessary upgrades to national test bed capabilities in support of countering WMD test and evaluation activities and environmental compliance.					
Accomplishments/Planned Programs Subtotals	18.426	18.311	23.120	0.000	23.120

C. Other Program Funding Summary (\$ in Millions)											
Line Item	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
• 34/0603160BR: <i>Counter Weapons of Mass Destruction Advanced Technology Development</i>	0.010	4.523	9.530	0.000	9.530	10.170	10.063	10.150	7.557	Continuing	Continuing
Remarks											

D. Acquisition Strategy
Competitive selection of most appropriate performers to fulfill science and technology development needs.