Department of Homeland Security

Countering Weapons of Mass Destruction

Budget Overview

Fiscal Year 2020

Congressional Justification

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Countering Weapons of Mass Destruction

Appropriation Organization Structure

Organization Name	Level	Fund Type (* Includes Defense Funding)
Countering Weapons of Mass Destruction	**Component**	
Operations and Support	**Appropriation**	
Mission Support	PPA	Discretionary - Appropriation
Capability and Operational Support	PPA	Discretionary - Appropriation
Procurement, Construction, and Improvements	**Appropriation**	
Assets and Infrastructure Acquisition	PPA,Investment	Discretionary - Appropriation
Research and Development	**Appropriation**	
CWMD Research and Development	PPA	Discretionary - Appropriation
Federal Assistance	**Appropriation**	
Capability Building	PPA	Discretionary - Appropriation

Countering Weapons of Mass Destruction
Strategic Context

Component Overview

The strategic context presents the performance budget by tying together strategy, budget resource requests, programs, or PPAs, and performance measures that gauge the delivery of results to our stakeholders. The Common Appropriation Structure (CAS) allows DHS to integrate the strategic programmatic view with our budget view of resources. With this structure, a significant portion of the Level 1 PPAs represent what DHS refers to as our mission programs. A mission program is a group of activities acting together to accomplish a specific high-level outcome external to DHS and includes operational processes, skills, technology, human capital, and other resources. The Capability and Operational Support and the Capability Building programs for CWMD have publically reported measures. These measures are presented in two measure sets, strategic and management measures. Strategic measures communicate results delivered for our agency goals and are considered our Government Performance and Results Act Modernization Act of 2010 (GPRAMA) measures. Additional management measures are displayed to provide a more thorough context of expected program performance for the Component related to its budgetary plans. Measure tables that do not display previous year's results are because the measure did not exist at that time.

Capability and Operational Support: The Capability and Operational Support program analyzes sensor data, defines requirements, provides test and evaluation capabilities, and procures chemical/biological and radiological/nuclear detection equipment that can be carried, worn, or easily moved to support operational end-users. The Program manages and supports national biosurveillance and detection capabilities, coordination, and preparedness for biological and chemical events to help communities build capabilities to prepare, respond, and recover.

Strategic Measures

Measure: Percent of cargo conveyances that pass through radiation portal monitors upon entering the nation via land border and international rail ports of entry						
Description: This measure gauges the proportion of cargo scanned by radiation detection equipment deployed to the Nation's land border crossing ports of entry and international rail ports of entry. It is expressed in terms of the percent of cargo conveyances scanned by radiation portal monitors (RPM) which enter the Nation through land ports of entry and by international rail. The Countering Weapons of Mass Destruction Office (CWMD) procures and/or installs RPMs at ports of entry, and the U.S. Customs and Border Protection (CBP) conducts the cargo scanning using RPMs to prevent nuclear and other radioactive materials that are out of regulatory control from entering the country via cargo conveyances.						
Fiscal Year:	**FY 2015**	**FY 2016**	**FY 2017**	**FY 2018**	**FY 2019**	**FY 2020**
Target:	FOUO	FOUO	FOUO	FOUO	FOUO	FOUO
Result:	FOUO	FOUO	FOUO	FOUO	TBD	TBD

Measure: Percent of containerized cargo conveyances that pass through radiation portal monitors at sea ports of entry						
Description: This measure gauges the amount of containerized cargo scanned by the radiation detection equipment deployed to the Nation's sea ports of entry. It is expressed in terms of the percent of containerized cargo conveyances that are scanned by radiation portal monitors (RPM) entering the nation through sea ports of entry. The Countering Weapons of Mass Destruction Office (CWMD) procures and/or installs RPMs at sea ports of entry and the U.S. Customs and Border Protection (CBP) conducts the cargo scanning using the RPMs to prevent nuclear and other radioactive materials that are out of regulatory control from entering into the country via cargo containers at sea ports of entry.						
Fiscal Year:	**FY 2015**	**FY 2016**	**FY 2017**	**FY 2018**	**FY 2019**	**FY 2020**
Target:	FOUO	FOUO	FOUO	FOUO	FOUO	FOUO
Result:	FOUO	FOUO	FOUO	FOUO	TBD	TBD

Measure: Percent of top 25 special events integrating biodetection monitoring						
Description:						
Fiscal Year:	**FY 2015**	**FY 2016**	**FY 2017**	**FY 2018**	**FY 2019**	**FY 2020**
Target:	FOUO	FOUO	FOUO	FOUO	FOUO	FOUO
Result:	FOUO	FOUO	FOUO	FOUO	TBD	TBD

CWMD Research and Development: The CWMD Research and Development program manages efforts to identify, explore, develop, and demonstrate science and technologies that address gaps in the detection architecture. Activities also improve the performance of detection and analysis and forensics capabilities, and/or significantly reduce the operational burden of detection systems in the field. The program works closely with supported operational customers to ensure the effective transition of technologies to the field. This program includes Technology Advancement projects, as well as Small Business Innovation Research projects.

Management Measures

Measure: Percent of Research & Development program and project milestones successfully achieved						
Description: This measure will gauge how well Research and Development program and project activities and their progress milestones are executed by DNDO's Transformational and Applied Research Directorate against numerous types of projects that are planned for and budgeted each year. A steady or slightly increasing number of milestones met is an indicator of effective program management.						
Fiscal Year:	**FY 2015**	**FY 2016**	**FY 2017**	**FY 2018**	**FY 2019**	**FY 2020**
Target:	---	---	95.0%	95.0%	95.0%	95.0%
Result:	---	---	89.0%	60.0%	TBD	TBD

Countering Weapons of Mass Destruction

Budget Comparison and Adjustments

Budget Comparison with FY 2019 Annualized CR

Organization *(Dollars in Thousands)*	FY 2018 Enacted	FY 2019 Annualized CR	FY 2019 President's Budget	FY 2020 President's Budget
Operations and Support	**-**	**-**	**$209,264**	**$212,573**
Mission Support	-	-	$83,321	$84,583
Capability and Operational Support	-	-	$125,943	$127,990
Procurement, Construction, and Improvements	**-**	**-**	**$74,896**	**$78,241**
Assets and Infrastructure Acquisition	-	-	$74,896	$78,241
Research and Development	**-**	**-**	**$80,443**	**$67,681**
CWMD Research and Development	-	-	$80,443	$67,681
Federal Assistance	**-**	**-**	**$64,663**	**$64,663**
Capability Building	-	-	$64,663	$64,663
Total	**-**	**-**	**$429,266**	**$423,158**

Countering Weapons of Mass Destruction
Comparison of Budget Authority and Request

Organization (Dollars in Thousands)	FY 2018 Enacted			FY 2019 President's Budget			FY 2020 President's Budget			FY 2019 to FY 2020 Total Changes		
	Pos.	FTE	Amount	Pos.	FTE	Amount	Pos.	FTE	Amount	Pos.	FTE	Amount
Operations and Support	-	-	-	248	232	$209,264	248	232	$212,573	-	-	$3,309
Procurement, Construction, and Improvements	-	-	-	-	-	$74,896	-	-	$78,241	-	-	$3,345
Research and Development	-	-	-	-	-	$80,443	-	-	$67,681	-	-	($12,762)
Federal Assistance	-	-	-	-	-	$64,663	-	-	$64,663	-	-	-
Total	**-**	**-**	**-**	**248**	**232**	**$429,266**	**248**	**232**	**$423,158**	**-**	**-**	**($6,108)**
Subtotal Discretionary - Appropriation	-	-	-	248	232	$429,266	248	232	$423,158	-	-	($6,108)

Component Budget Overview

For FY 2020, the Countering Weapons of Mass Destruction Office (CWMD) requests $423.2M in total gross budget authority. This represents a decrease of $6.1M from the FY 2019 President's Budget.

CWMD was established in December of 2017 to elevate and focus the CWMD missions within DHS and to provide a focal point for the interagency. The danger from hostile state and non-state actors who are trying to acquire nuclear, chemical, radiological, and biological weapons is increasing. CWMD's objective is to support the President's National Security Strategy and lead the Department's efforts to develop and enhance CWMD programs and capabilities that defend against WMD, and combat bio-threats and pandemics. CWMD will give our frontline defenders – including homeland security, law enforcement, and intelligence professionals – the tools and resources to stop WMD terrorist acts before they take place. CWMD's mission focus is to close gaps and reduce the risk of terrorism by detecting and disrupting WMD and the pathways to the United States. CWMD serves as the Department's representative at domestic, interagency, and international venues related to CWMD strategy, policy, planning, investment, acquisition and joint operational matters. CWMD supports DHS and partners' frontline operations, and addresses critical vulnerabilities in preventing, protecting against, responding to, and mitigating nuclear, chemical, radiological, and biological, threats and incidents. Further, CWMD leads the Department's emerging infectious disease preparedness and response activities and via the Chief Medical Officer (CMO) has the responsibility within the Department for medical issues related to natural disasters, acts of terrorism, and other man-made disasters.

Countering Weapons of Mass Destruction
Budget Authority and Obligations

Budget Authority *(Dollars in Thousands)*	**FY 2018**	**FY 2019**	**FY 2020**
Enacted/Request	**-**	**$429,266**	**$423,158**
Carryover and/or Recoveries (Actual/Estimates/Projections)	-	$154,822	-
Rescissions to Current Year/Budget Year	-	-	-
Net Sequestered Resources	-	-	-
Reprogrammings/Transfers	-	-	-
Supplementals	-	-	-
Total Budget Authority	**-**	**$584,088**	**$423,158**
Collections – Reimbursable Resources	-	$1,320	$1,625
Total Budget Resources	**-**	**$585,408**	**$424,783**
Obligations (Actual/Estimates/Projections)	-	$585,408	$424,783
Personnel: Positions and FTE			
Enacted/Request Positions	-	248	248
Enacted/Request FTE	-	232	232
Onboard and Actual FTE; Includes Collections - Reimbursable Resources			
Onboard (Actual/Estimates/Projections)	-	248	248
FTE (Actual/Estimates/Projections)	-	232	232

Countering Weapons of Mass Destruction
Collections - Reimbursable Resources

Collections		FY 2018 Enacted			FY 2019 President's Budget			FY 2020 President's Budget			FY 2019 to FY 2020 Change		
(Dollars in Thousands)		Pos.	FTE	Amount	Pos.	FTE	Amount	Pos.	FTE	Amount	Pos.	FTE	Amount
Department of Defense - Department of Defense	**Source**	-	-	-	-	-	$524	-	-	$524	-	-	-
Operations and Support	Location	-	-	-	-	-	$524	-	-	$524	-	-	-
Capability and Operational Support	Location	-	-	-	-	-	$524	-	-	$524	-	-	-
Department of Defense - Navy, Marine Corps	**Source**	-	-	-	-	-	$75	-	-	$100	-	-	$25
Operations and Support	Location	-	-	-	-	-	$75	-	-	$100	-	-	$25
Capability and Operational Support	Location	-	-	-	-	-	$75	-	-	$100	-	-	$25
Department of Homeland Security - Federal Emergency Management Agency	**Source**	-	-	-	-	-	$260	-	-	$360	-	-	$100
Operations and Support	Location	-	-	-	-	-	$260	-	-	$360	-	-	$100
Mission Support	Location	-	-	-	-	-	$260	-	-	$360	-	-	$100
Department of Homeland Security - US Customs and Border Protection	**Source**	-	-	-	-	-	$260	-	-	$260	-	-	-
Operations and Support	Location	-	-	-	-	-	$260	-	-	$260	-	-	-
Mission Support	Location	-	-	-	-	-	$260	-	-	$260	-	-	-
Department of Homeland Security - Departmental Management and Operations	**Source**	-	-	-	-	-	$201	-	-	$205	-	-	$4
Operations and Support	Location	-	-	-	-	-	$201	-	-	$205	-	-	$4
Capability and Operational Support	Location	-	-	-	-	-	$201	-	-	$205	-	-	$4
Office of the Director of National Intelligence	**Source**	-	-	-	-	-	-	-	-	$176	-	-	$176
Operations and Support	Location	-	-	-	-	-	-	-	-	$176	-	-	$176
Mission Support	Location	-	-	-	-	-	-	-	-	$176	-	-	$176
Total Collections		**-**	**-**	**-**	**-**	**-**	**$1,320**	**-**	**-**	**$1,625**	**-**	**-**	**$305**

Countering Weapons of Mass Destruction
Personnel Compensation and Benefits

Pay Summary

Organization (Dollars in Thousands)	FY 2018 Enacted				FY 2019 President's Budget				FY 2020 President's Budget				FY 2019 to FY 2020 Total			
	Pos.	FTE	Amount	Rate	Pos.	FTE	Amount	Rate	Pos.	FTE	Amount	Rate	Pos.	FTE	Amount	Rate
Operations and Support	-	-	-	-	248	232	$48,605	$180.34	248	232	$49,584	$183.48	-	-	$979	$3.14
Total	**-**	**-**	**-**	**-**	**248**	**232**	**$48,605**	**$180.34**	**248**	**232**	**$49,584**	**$183.48**	**-**	**-**	**$979**	**$3.14**
Discretionary - Appropriation	-	-	-	-	248	232	$48,605	$180.34	248	232	$49,584	$183.48	-	-	$979	$3.14

Pay by Object Class

Pay Object Classes (Dollars in Thousands)	FY 2018 Enacted	FY 2019 President's Budget	FY 2020 President's Budget	FY 2019 - FY 2020 Change
11.1 Full-time Permanent	-	$31,697	$31,697	-
11.5 Other Personnel Compensation	-	$462	$462	-
11.8 Special Personal Services Payments	-	$6,766	$7,016	$250
12.1 Civilian Personnel Benefits	-	$9,680	$10,409	$729
Total - Personnel Compensation and Benefits	**-**	**$48,605**	**$49,584**	**$979**
Positions and FTE				
Positions - Civilian	-	248	248	-
FTE - Civilian	-	232	232	-

Countering Weapons of Mass Destruction
Non Pay Budget Exhibits

Non Pay Summary

Organization *(Dollars in Thousands)*	**FY 2018 Enacted**	**FY 2019 President's Budget**	**FY 2020 President's Budget**	**FY 2019 to FY 2020 Total Changes**
Operations and Support	-	$160,659	$162,989	$2,330
Procurement, Construction, and Improvements	-	$74,896	$78,241	$3,345
Research and Development	-	$80,443	$67,681	($12,762)
Federal Assistance	-	$64,663	$64,663	-
Total	**-**	**$380,661**	**$373,574**	**($7,087)**
Discretionary - Appropriation	-	$380,661	$373,574	($7,087)

Non Pay by Object Class

Non-Pay Object Classes *(Dollars in Thousands)*	**FY 2018 Enacted**	**FY 2019 President's Budget**	**FY 2020 President's Budget**	**FY 2019 to FY 2020 Change**
21.0 Travel and Transportation of Persons	-	$2,108	$2,027	($81)
23.1 Rental Payments to GSA	-	$11,722	$11,722	-
23.3 Communications, Utilities, and Misc. Charges	-	-	$301	$301
24.0 Printing and Reproduction	-	$31	$55	$24
25.1 Advisory and Assistance Services	-	$74,353	$73,275	($1,078)
25.2 Other Services from Non-Federal Sources	-	$18,759	$20,316	$1,557
25.3 Other Goods and Services from Federal Sources	-	$74,726	$62,043	($12,683)
25.5 Research and Development Contracts	-	$44,642	$35,701	($8,941)
25.7 Operation and Maintenance of Equipment	-	$4,967	$5,866	$899
26.0 Supplies and Materials	-	$11,434	$11,434	-
31.0 Equipment	-	$85,193	$98,879	$13,686
41.0 Grants, Subsidies, and Contributions	-	$52,726	$51,955	($771)
Total - Non Pay Object Classes	**-**	**$380,661**	**$373,574**	**($7,087)**

Countering Weapons of Mass Destruction
Supplemental Budget Justification Exhibits
Working Capital Fund

Appropriation and PPA *(Dollars in Thousands)*	FY 2018 Enacted	FY 2019 President's Budget	FY 2020 President's Budget
Operations and Support	**-**	**$18,844**	**$17,842**
Mission Support	-	$18,844	$17,842
Total Working Capital Fund	**-**	**$18,844**	**$17,842**

Countering Weapons of Mass Destruction
Status of Congressionally Requested Studies, Reports and Evaluations

Fiscal Year	Due Date	Reference/Citation	Requirement	Status
2018	6/21/2018	FY 2018 Appropriations P.L 115-141 Consolidated Appropriations Act 2018 and its accompanying Joint Explanatory Notes	National Biosurveillance 5 Year Plan	In Process

Countering Weapons of Mass Destruction
Authorized/Unauthorized Appropriations

Budget Activity *(Dollars in Thousands)*	Last year of Authorization	Authorized Level	Appropriation in Last Year of Authorization	FY 2020 President's Budget
	Fiscal Year	Amount	Amount	Amount
Operations and Support	**N/A**	**N/A**	**N/A**	**$212,573**
Mission Support	N/A	N/A	N/A	$84,583
Capability and Operational Support	N/A	N/A	N/A	$127,990
Procurement, Construction, and Improvements	**N/A**	**N/A**	**N/A**	**$78,241**
Assets and Infrastructure Acquisition	N/A	N/A	N/A	$78,241
Research and Development	**N/A**	**N/A**	**N/A**	**$67,681**
CWMD Research and Development	N/A	N/A	N/A	$67,681
Federal Assistance	**N/A**	**N/A**	**N/A**	**$64,663**
Capability Building	N/A	N/A	N/A	$64,663
Total Direct Authorization/Appropriation	**N/A**	**N/A**	**N/A**	**$423,158**

The Countering Weapons of Mass Destruction Act of 2018 (P.L. 115-387) (Dec. 21, 2018) authorizing the creation of the CWMD Office did not specify funding levels for the CWMD Office.

Countering Weapons of Mass Destruction
Proposed Legislative Language

Operations and Support

For necessary expenses of the Countering Weapons of Mass Destruction Office for operations and support, as authorized by law, [$209,264,000]*$212,573,000, of which $59,547,000 shall remain available until September 30, 2021*: Provided, That not to exceed $4,500 shall be for official reception and representation expenses.

Language Provision	Explanation
…[$209,264,000]*$212,573,000,*	Dollar change only. No substantial change proposed.
…of which $59,547,000 shall remain available until September 30, 2021	Two-year period of availability in Capability and Operational Support PPA for funding Acquisition and Strategic Planning and Analysis activities is proposed. The two-year funding is required because of the extended time needed for proper procurement of detection devices, biosurveillance activities, and chemical & biological support acquisitions.

Procurement, Construction, and Improvements

For necessary expenses of the Countering Weapons of Mass Destruction Office for procurement, construction, and improvements, [$74,896,000]*$78,241,000*, to remain available until September 30, [2021]*2022*.

Language Provision	Explanation
…[$74,896,000]*$78,241,000*	Dollar change only. No substantial change proposed.
…[2021]*2022*	Fiscal year change only. No substantial change proposed.

Research and Development

For necessary expenses of the Countering Weapons of Mass Destruction Office for research and development, [$80,443,000]*$67,681,000*, to remain available until September 30, [2021]*2022*.

Language Provision	Explanation
…[$80,443,000]*$67,681,000*	Dollar change only. No substantial change proposed.
…[2021]*2022*	Fiscal year change only. No substantial change proposed. Based on average time to identify and complete the scope of work for R&D projects, CWMD requests three-year funding to align with FY 2019 Consolidated Appropriations Act. Three year funding allows for sufficient time to define research topics, solicit for performer(s), conduct source selection, award contract(s), initiate research, identify technology approaches, conduct repeated refinement of the technological approaches and demonstrate the technology in the relevant operational environment.

Federal Assistance

For necessary expenses of the Countering Weapons of Mass Destruction Office for Federal assistance through grants, contracts, cooperative agreements, and other activities, $64,663,000, to remain available until September 30, [2021]*2022*.

Language Provision	Explanation
…[2021]*2022*	Fiscal year change only. No substantial change proposed.

Department of Homeland Security

Countering Weapons of Mass Destruction

Operations and Support

Fiscal Year 2020
Congressional Justification

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Operations and Support

Budget Comparison and Adjustments

Comparison of Budget Authority and Request

Organization (Dollars in Thousands)	FY 2018 Enacted			FY 2019 President's Budget			FY 2020 President's Budget			FY 2019 to FY 2020 Total Changes		
	Pos.	FTE	Amount	Pos.	FTE	Amount	Pos.	FTE	Amount	Pos.	FTE	Amount
Mission Support	-	-	-	248	232	$83,321	248	232	$84,583	-	-	$1,262
Capability and Operational Support	-	-	-	-	-	$125,943	-	-	$127,990	-	-	$2,047
Total	**-**	**-**	**-**	**248**	**232**	**$209,264**	**248**	**232**	**$212,573**	**-**	**-**	**$3,309**
Subtotal Discretionary - Appropriation	-	-	-	248	232	$209,264	248	232	$212,573	-	-	$3,309

The Department's Countering Weapons of Mass Destruction Office (CWMD) exists to protect the American people and the homeland from the dangers posed by hostile state and non-state actors who would acquire and use nuclear, chemical, radiological, or biological materials in the form of weapons of mass destruction (WMD) to harm Americans or U.S. interests. CWMD does this through its prevention and detection mission activities. This mission aligns with Pillar I of the President's National Security Strategy.

Operations and Support (O&S) funds chemical, biological, radiological, nuclear, and medical support programs and activities. O&S also provides for readiness activities in support of local jurisdiction and international operators, and DHS operating Components. CWMD pursues this by establishing, maintaining, and supporting programs and activities to defend against WMD, and combat biothreats and pandemics. O&S funding supports the costs incurred for the day-to-day operation of the organization, including, but not limited to salaries, travel, and enterprise business services; as well as development of CWMD capabilities through strategic planning and analysis; supporting components and other agencies to define requirements supporting operations; ensuring an efficient test and evaluation program, and the procurement of equipment and services in support of the counter-WMD mission. CWMD O&S includes management of bio-detection operations, coordination of DHS biodefense activities, and support for activities that help communities prepare and build capacity to detect, identify, and respond to biological, chemical, radiological, and/or nuclear events. CWMD programs and activities exist to fulfill DHS mission areas are in alignment with the National Security Strategy.

The appropriation is broken out into the following Programs, Projects, and Activities (PPA):

Mission Support: Mission Support provides funding for the Office of the Assistant Secretary & Enterprise Services. Funds support personnel compensation and benefits for CWMD employees and provides enterprise leadership, management, and business administration in support of daily operations. Key capabilities include workforce management, financial management, physical and personnel security, goods and services acquisition, information technology, property and assets management, communications, and general management and administration. Funds are also provided to the Working Capital Fund, which provides such services as rent and information technology infrastructure support.

Capability & Operational Support (C&OS): The Capability & Operational Support PPA provides situational awareness and decision support for DHS leadership and Federal partners; the development of CWMD capabilities through strategic planning and analysis; assisting DHS operational Components and other agencies in defining requirements necessary to achieve their mission; and the procurement, testing, and evaluation of CWMD equipment. CWMD supports Components and other agencies through the definition of requirements, ensuring an efficient test and evaluation program, and the procurement of chemical, biological, and radiological detection equipment. The O&S appropriation funds equipment with an end item unit cost of $250,000 or less; for radiological detection equipment this typically relates to portable detection systems that can be carried, worn, or easily moved to support operational end-users but also includes the Radiation Portal Monitor (RPM) program which is a post-Full Operational Capability (FOC) program. The O&S appropriation supports the Office of the Chief Medical Officer who has the responsibility within the Department for medical issues related to natural disasters, acts of terrorism, and other man-made disasters. CWMD manages and supports bio-detection systems, coordinates DHS biological defense activities, and supports preparedness for biological and chemical events to help communities prepare, respond, and recover. C&OS supports bio-detection in more than 30 jurisdictions, including activities such as laboratory analysis and support, consumables, reagents, and local quality checks.

Operations and Support
Budget Authority and Obligations

Budget Authority *(Dollars in Thousands)*	FY 2018	FY 2019	FY 2020
Enacted/Request	**-**	**$209,264**	**$212,573**
Carryover and/or Recoveries (Actual/Estimates/Projections)	-	$3,701	-
Rescissions to Current Year/Budget Year	-	-	-
Net Sequestered Resources	-	-	-
Reprogrammings/Transfers	-	-	-
Supplementals	-	-	-
Total Budget Authority	**-**	**$212,965**	**$212,573**
Collections – Reimbursable Resources	-	$1,320	$1,625
Total Budget Resources	**-**	**$214,285**	**$214,198**
Obligations (Actual/Estimates/Projections)	-	$214,285	$214,198
Personnel: Positions and FTE			
Enacted/Request Positions	-	248	248
Enacted/Request FTE	-	232	232
Onboard and Actual FTE; Includes Collections - Reimbursable Resources			
Onboard (Actual/Estimates/Projections)	-	248	248
FTE (Actual/Estimates/Projections)	-	232	232

*Carryover displays prior year Office of Health Affairs funding that will be expended by both CWMD and OCHCO Workforce Health and Safety in FY2019.

Operations and Support
Collections – Reimbursable Resources

Collections		FY 2018 Enacted			FY 2019 President's Budget			FY 2020 President's Budget		
(Dollars in Thousands)		Pos.	FTE	Amount	Pos.	FTE	Amount	Pos.	FTE	Amount
Department of Defense - Department of Defense	**Source**	-	-	-	-	-	$524	-	-	$524
Department of Defense - Navy, Marine Corps	**Source**	-	-	-	-	-	$75	-	-	$100
Department of Homeland Security - Federal Emergency Management Agency	**Source**	-	-	-	-	-	$260	-	-	$360
Department of Homeland Security - US Customs and Border Protection	**Source**	-	-	-	-	-	$260	-	-	$260
Department of Homeland Security - Departmental Management and Operations	**Source**	-	-	-	-	-	$201	-	-	$205
Office of the Director of National Intelligence	**Source**	-	-	-	-	-	-	-	-	$176
Total Collections		**-**	**-**	**-**	**-**	**-**	**$1,320**	**-**	**-**	**$1,625**

Operations and Support
Summary of Budget Changes

Budget Formulation Activity *(Dollars in Thousands)*	Positions	FTE	Amount
FY 2018 Enacted	**-**	**-**	**-**
FY 2019 President's Budget	**248**	**232**	**$209,264**
FY 2020 Base Budget	**248**	**232**	**$209,264**
Transfer to CWMD/MS from MGMT/OCSO for Background Investigations	-	-	$111
Transfer to MGMT/OCFO from CWMD/MS for Bankcard Program	-	-	($3)
Transfer to MGMT/OCFO from CWMD/MS for Integrated Audit	-	-	($25)
Transfer to MGMT/OCFO from CWMD/MS for TIER	-	-	($210)
Transfer to MGMT/OCIO from CWMD/MS for CPIC	-	-	($122)
Transfer to O&S from PC&I for Radiation Portal Monitor Program	-	-	$24,046
Transfer to R&D/Technical Forensics from O&S/C&OS	-	-	($2,600)
Total Transfers	**-**	**-**	**$21,197**
FERS Agency Contribution Increase	-	-	$729
National Capital Region Infrastructure Operations (NCRIO) Sustainment	-	-	$782
Total, Pricing Increases	**-**	**-**	**$1,511**
CWMD Sensor Capability Deployment Change	-	-	($200)
Total, Pricing Decreases	**-**	**-**	**($200)**
Total Adjustments-to-Base	**-**	**-**	**$22,508**
FY 2020 Current Services	**248**	**232**	**$231,772**
Special Mission Support	-	-	$2,000
Strategic Planning and Analysis	-	-	$2,000
Total, Program Increases	**-**	**-**	**$4,000**
Biological Support Reduction	-	-	($2,700)
Chemical Support Reduction	-	-	($5,000)
Radiation Portal Monitor (RPM) Decrease	-	-	($10,299)
Readiness - Operational Preparedness & Assessments Decrease	-	-	($5,200)
Total, Program Decreases	**-**	**-**	**($23,199)**
FY 2020 Request	**248**	**232**	**$212,573**
FY 2019 To FY 2020 Change	**-**	**-**	**$3,309**

Operations and Support
Justification of Transfers

Transfers *(Dollars in Thousands)*	FY 2020 President's Budget		
	Positions	FTE	Amount
Transfer 1 - Transfer to CWMD/MS from MGMT/OCSO for Background Investigations	**-**	**-**	**$111**
Mission Support	-	-	$111
Transfer 2 - Transfer to MGMT/OCFO from CWMD/MS for Bankcard Program	**-**	**-**	**($3)**
Mission Support	-	-	($3)
Transfer 3 - Transfer to MGMT/OCFO from CWMD/MS for Integrated Audit	**-**	**-**	**($25)**
Mission Support	-	-	($25)
Transfer 4 - Transfer to MGMT/OCFO from CWMD/MS for TIER	**-**	**-**	**($210)**
Mission Support	-	-	($210)
Transfer 5 - Transfer to MGMT/OCIO from CWMD/MS for CPIC	**-**	**-**	**($122)**
Mission Support	-	-	($122)
Transfer 6 - Transfer to O&S from PC&I for Radiation Portal Monitor Program	**-**	**-**	**$24,046**
Capability and Operational Support	-	-	$24,046
Transfer 7 - Transfer to R&D/Technical Forensics from O&S/C&OS	**-**	**-**	**($2,600)**
Capability and Operational Support	-	-	($2,600)
Total Transfers	**-**	**-**	**$21,197**

Transfer 1 – Transfer to CWMD/MS from MGMT/OCSO for Background Investigations: This transfer corresponds to Components costs related to the initiation, scheduling, and adjudication of background investigations for Federal, civilian and contract employment. Components will provide the funding back to the DHS Chief Security Officer (OCSO) through a Working Capital Fund (WCF) fee for service.

Transfer 2 – Transfer to MGMT/OCFO from CWMD/MS for Bankcard Program: Transfer to MGMT for a centralized DHS bankcard invoicing and payment system. Previously, CWMD paid for this activity through the WCF.

Transfer 3 – Transfer to MGMT/OCFO from CWMD/MS for Integrated Audit: Transfer to the Management Directorate (MGMT) the costs associated with combined independent audits of financial statements and internal controls. Previously, CWMD paid for this activity through the WCF.

Transfer 4 – Transfer to MGMT/OCFO from CWMD/MS for TIER: Transfer to MGMT the Department's application for creating automated financial statements, which enables reporting of monthly, quarterly, and annual reporting requirements. Previously, CWMD paid for this activity

through the WCF.

Transfer 5 – Transfer to MGMT/OCIO from CWMD/MS for CPIC: Transfer to MGMT for capital planning and investment controls that support the preparation of decision packages for DHS investment review boards at key acquisition decision points. Previously, CWMD paid for this activity through the WCF.

Transfer 6 – Transfer to O&S from PC&I for Radiation Portal Monitor Program: The RPM program is a post-Full Operating Capability (FOC) program. Base funding authority is being transferred from PC&I to O&S to comply with the DHS financial policy which requires the use of O&S funding to acquire and maintain assets when the end item costs less than $250,000.

Transfer 7 – Transfer to R&D/Technical Forensics from O&S/C&OS: Base funding for National Nuclear Forensics Expertise Development Program is being transferred from the Operations and Support appropriation to Research and Development (R&D). This program maintains the technical expertise required to execute the Nation's nuclear forensics mission through interdisciplinary R&D collaboration among students, academic departments, universities, and national laboratories.

Operations and Support
Justification of Pricing Changes

Pricing Changes *(Dollars in Thousands)*	FY 2020 President's Budget		
	Positions	FTE	Amount
Pricing Change 1 - CWMD Sensor Capability Deployment Change	**-**	**-**	**($200)**
Capability and Operational Support	-	-	($200)
Pricing Change 2 - FERS Agency Contribution Increase	**-**	**-**	**$729**
Mission Support	-	-	$729
Pricing Change 3 - National Capital Region Infrastructure Operations (NCRIO) Sustainment	**-**	**-**	**$782**
Mission Support	-	-	$782
Total Pricing Changes	**-**	**-**	**$1,311**

Pricing Change 1 – CWMD Sensor Capability Deployment Change: This pricing change reflects a decrease in the Personal Radiation Detectors procured for the US Coast Guard.

Pricing Change 2 – FERS Agency Contribution Increase: Per OMB Circular A-11, agency Federal Employee Retirement System (FERS) contributions increased. The regular FERS agency contribution increased by 2.3% from 13.7% in FY 2019 to 16.0% in FY 2020. The agency contribution amount for the Civil Service Retirement System did not change.

Pricing Change 3 – National Capital Region Infrastructure Operations (NCRIO) Sustainment: This pricing change reflects the DHS directed increase in the cost of IT support.

Operations and Support
Justification of Program Changes

Program Changes *(Dollars in Thousands)*	FY 2020 President's Budget		
	Positions	FTE	Amount
Program Change 1 - Biological Support Reduction	-	-	**($2,700)**
Capability and Operational Support	-	-	($2,700)
Program Change 2 - Chemical Support Reduction	-	-	**($5,000)**
Capability and Operational Support	-	-	($5,000)
Program Change 3 - Radiation Portal Monitor (RPM) Decrease	-	-	**($10,299)**
Capability and Operational Support	-	-	($10,299)
Program Change 4 - Readiness - Operational Preparedness & Assessments Decrease	-	-	**($5,200)**
Capability and Operational Support	-	-	($5,200)
Program Change 5 - Special Mission Support	-	-	**$2,000**
Capability and Operational Support	-	-	$2,000
Program Change 6 - Strategic Planning and Analysis	-	-	**$2,000**
Capability and Operational Support	-	-	$2,000
Total Program Changes	-	-	**($19,199)**

Program Change 1 - Biological Support Reduction:

Description
The FY 2020 request includes a reduction of $2.7M for Biological Support.

Justification
BioWatch intends to begin reducing program support as alternative detection systems are being developed, allowing for cost reductions in the overall BioWatch program budget.

Performance
The reduction is targeted in program support to minimize potential impacts on biological support field operations.

Program Change 2 – Chemical Support Reduction:

Description
The FY 2020 request includes a reduction of $5.0M to Chemical Support Program.

Justification
The FY 2019 funding supports one-time projects to enhance understanding of chemical threat and response capability and will be executed in coordination with the Chemical Security Analysis Center. These projects will not require recurring funding so the funding is being reallocated to other CWMD priorities in FY 2020.

Performance
The proposed reduction will not adversely impact performance. The proposed funding is sufficient to sustain current efforts and expand capabilities within Chemical Support.

Program Change 3 - Radiation Portal Monitor (RPM) Decrease:

Description
The FY 2020 request includes a reduction of $10.3M for the RPM Program. The base is being transferred to O&S to comply with DHS financial policy that requires the use of O&S funding to acquire and maintain assets when the end item costs less than $250,000.

Justification
The RPM Program is a post-Full Operating Capability (FOC) program with the objective to maintain scanning coverage at previously deployed sites. The reduction will permit CWMD to maintain and continue the capability to cost effectively scan cargo for Radiological and Nuclear (R/N) threats at land, sea, and air Ports of Entry (POE), without an adverse impact to the flow of commerce. The requested funding will support all deployment and sustainment activities per the approved CWMD and CBP jointly developed Project Execution Plan (PEP). The FY 2020 – FY 2024 RPM PEP will be scoped in accordance with available funding to ensure there is no adverse impact to the program.

Performance
There is no performance impact with this reduction. The RPM sustainment and modernization strategy is based on scoping the PEP to available funding which annually aligns program activities with funding. This ensures priority activities are accomplished and deferred activities have minimal impact due to the relatively lower priority of those activities.

Program Change 4 – Readiness – Operational Preparedness & Assessments:

Description
The FY 2020 request includes a reduction of $5.2M to Operational Preparedness – Field Training (formerly Technical Assessments).

Justification
Consistent with CWMD priorities, a reduction in funding to the Net Assessments and Field Training projects will be used to field additional detection system capability for operational mission partners.

Performance
Elimination of this funding to support Net Assessments and Field Training will have minimal impact on CWMD's mission. The Net Assessments function was an internal evaluation program intended to help improve DNDO (now CWMD) internal processes. CWMD has institutionalized methodology such as the Solution Development Process that provides for process improvement in all CWMD programs eliminating the need for a separate assessment program. CWMD has consolidated all funding for its Field Training activity within the Federal Assistance Appropriation. Changes in support providers will reduce overall costs to program management and execution allowing a reduction in the funding provided for Field Training.

Program Change 5 - Special Mission Support:

Description
The FY 2020 request includes an increase of $2.0M to provide commercial-off-the-shelf and Government-off-the-shelf (COTS/GOTS) capabilities to various component Special Mission Units to increase and/or recapitalize their CWMD equipment and/or sustainment of that equipment to bolster their CWMD mission areas.

Justification
Special Mission Units rapidly deploy to assist Federal On-Scene Coordinators and thus require specialized equipment for preparation and response to radiological, chemical, biological, and other weapons of mass destruction incidents. This request will provide specialized CWMD equipment to prevent gaps in protection and will ensure higher levels of readiness by increasing the number of Special Mission Operators available to respond. The funding will support increased training opportunities, increased equipment readiness and will increase the available capability.

Performance
This change increases CWMD and operational user performance. The request will increase readiness and the ability to respond to threats, while also upgrading the connectivity of operators and data. The data sharing capabilities provided by this increase supports the CWMD Information Architecture linking data/information from CWMD sensors to local, regional, national operations centers to support CWMD operations. Efforts in this investment area support the CWMD Vision to deliver fully integrated, CWMD capabilities that protect Americans by preventing WMD terrorism and promoting DHS readiness against chemical, biological, radiological, nuclear, and other health security threats, directly aligning to the DHS Mission to Prevent Terrorism and Enhance Security.

Program Change 6 – Strategic Planning and Analysis:

Description
The FY 2020 request includes an increase of $2.0M to support the CWMD Information and Anomaly Detection Support Initiative.

Justification
DHS established CWMD in order to counter attempts by terrorists or other threat actors to carry out an attack against the United States or its interests using a weapon of mass destruction. With this challenging mission, it is imperative that the CWMD office quickly develop a robust and technologically advanced analytic capability to combat the threats from chemical, biological, radiological, and nuclear threats to the homeland and our interests. To effectively accomplish this, the Department is expanding an operationally-focused organization with specialized capabilities to organically execute the following key functions: provide operationally-focused WMD intelligence, sensor data interpretation and tool integration, biosurveillance, operational integration with Departmental field operations, & DoD/IC/IA/Foreign Partner collaboration.

Performance
This change will support operationally-focused CWMD intelligence and data analytics to enable detection, identification and disruption of Homeland WMD threats. This effort will 1) extend Intel team and big data analytic team to the National Targeting Center (NTC); 2) provide 24/7 support to NTC Cargo Watch floor, CBP Sensitive Compartmented Information Facility (SCIF and CWMD SCIF); and 3) establish robust analytics team at CWMD.

Operations and Support
Personnel Compensation and Benefits

Pay Summary

Organization (Dollars in Thousands)	FY 2018 Enacted				FY 2019 President's Budget				FY 2020 President's Budget				FY 2019 to FY 2020 Total			
	Pos.	FTE	Amount	Rate	Pos.	FTE	Amount	Rate	Pos.	FTE	Amount	Rate	Pos.	FTE	Amount	Rate
Mission Support	-	-	-	-	248	232	$46,308	$180.34	248	232	$47,037	$183.48	-	-	$729	$3.14
Capability and Operational Support	-	-	-	-	-	-	$2,297	-	-	-	$2,547	-	-	-	$250	-
Total	**-**	**-**	**-**	**-**	**248**	**232**	**$48,605**	**$180.34**	**248**	**232**	**$49,584**	**$183.48**	**-**	**-**	**$979**	**$3.14**
Discretionary - Appropriation	-	-	-	-	248	232	$48,605	$180.34	248	232	$49,584	$183.48	-	-	$979	$3.14

* The FTE rate calculation does not include Object Class 11.8-Special Personal Services Payments or 13.0-Benefits for Former Personnel. This applies to all FTE rate calculations in this appropriation.

Pay by Object Class

Pay Object Classes (Dollars in Thousands)	FY 2018 Enacted	FY 2019 President's Budget	FY 2020 President's Budget	FY 2019 - FY 2020 Change
11.1 Full-time Permanent	-	$31,697	$31,697	-
11.5 Other Personnel Compensation	-	$462	$462	-
11.8 Special Personal Services Payments	-	$6,766	$7,016	$250
12.1 Civilian Personnel Benefits	-	$9,680	$10,409	$729
Total - Personnel Compensation and Benefits	**-**	**$48,605**	**$49,584**	**$979**
Positions and FTE				
Positions - Civilian	-	248	248	-
FTE - Civilian	-	232	232	-

Operations and Support
Permanent Positions by Grade – Appropriation

Grades and Salary Range *(Dollars in Thousands)*	FY 2018 Enacted	FY 2019 President's Budget	FY 2020 President's Budget	FY 2019 to FY 2020 Change
Total, SES	-	24	24	-
GS-15	-	76	76	-
GS-14	-	75	75	-
GS-13	-	34	34	-
GS-12	-	15	15	-
GS-11	-	8	8	-
GS-9	-	4	4	-
GS-7	-	6	6	-
GS-5	-	1	1	-
GS-3	-	1	1	-
Other Graded Positions	-	4	4	-
Total Permanent Positions	**-**	**248**	**248**	**-**
Total Perm. Employment (Filled Positions) EOY	-	248	248	-
Position Locations				
Headquarters	-	248	248	-
Averages				
Average Personnel Costs, ES Positions	-	183,651	183,651	-
Average Personnel Costs, GS Positions	-	128,298	128,298	-
Average Grade, GS Positions	-	14	14	-

[1]Total SES includes Senior Executive Service (ES), Executive Schedule (EX), Senior Level Positions (SL) and Scientific and Professional Positions (ST). Other Graded Positions include the GP positions which include Physicians covered by the General Schedule classification system and GS base pay ranges who receive title 38 market pay instead of locality pay.

Operations and Support
Non Pay Budget Exhibits

Non Pay Summary

Organization *(Dollars in Thousands)*	FY 2018 Enacted	FY 2019 President's Budget	FY 2020 President's Budget	FY 2019 to FY 2020 Total Changes
Mission Support	-	$37,013	$37,546	$533
Capability and Operational Support	-	$123,646	$125,443	$1,797
Total	**-**	**$160,659**	**$162,989**	**$2,330**
Discretionary - Appropriation	-	$160,659	$162,989	$2,330

Non Pay by Object Class

Non-Pay Object Classes *(Dollars in Thousands)*	FY 2018 Enacted	FY 2019 President's Budget	FY 2020 President's Budget	FY 2019 to FY 2020 Change
21.0 Travel and Transportation of Persons	-	$1,675	$1,447	($228)
23.1 Rental Payments to GSA	-	$11,722	$11,722	-
23.3 Communications, Utilities, and Misc. Charges	-	-	$301	$301
24.0 Printing and Reproduction	-	$31	$55	$24
25.1 Advisory and Assistance Services	-	$50,476	$49,491	($985)
25.2 Other Services from Non-Federal Sources	-	$18,163	$18,763	$600
25.3 Other Goods and Services from Federal Sources	-	$48,146	$37,033	($11,113)
25.7 Operation and Maintenance of Equipment	-	$4,967	$5,866	$899
26.0 Supplies and Materials	-	$11,434	$11,434	-
31.0 Equipment	-	$13,395	$26,827	$13,432
41.0 Grants, Subsidies, and Contributions	-	$650	$50	($600)
Total - Non Pay Object Classes	**-**	**$160,659**	**$162,989**	**$2,330**

Mission Support – PPA

Budget Comparison and Adjustments

Comparison of Budget Authority and Request

Organization (Dollars in Thousands)	FY 2018 Enacted			FY 2019 President's Budget			FY 2020 President's Budget			FY 2019 to FY 2020 Total Changes		
	Pos.	FTE	Amount	Pos.	FTE	Amount	Pos.	FTE	Amount	Pos.	FTE	Amount
Mission Support	-	-	-	248	232	$83,321	248	232	$84,583	-	-	$1,262
Total	**-**	**-**	**-**	**248**	**232**	**$83,321**	**248**	**232**	**$84,583**	**-**	**-**	**$1,262**
Subtotal Discretionary - Appropriation	-	-	-	248	232	$83,321	248	232	$84,583	-	-	$1,262

PPA Level I Description

Mission Support funds personnel compensation and benefits for all CWMD employees and provides enterprise leadership, management, and business administration in support of daily operations. Key capabilities include workforce management, financial management, physical and personnel security, goods and services acquisition, information technology, property and assets management, communications, and general management and administration. Funds are also provided to the WCF, which provides services such as rent and information technology infrastructure support.

Programs funded by the Mission Support PPA include the following:

Office of the Assistant Secretary and Enterprise Services: The Office of the Assistant Secretary and Enterprise Services provides overall management of CWMD and develops long-range management plans for the efficient and effective operation of the organization. The office develops and reviews CWMD strategic direction, policy, and issues internal guidance to employees that is consistent with regulations, and the authority delegated by DHS. The office is supported by Chief of Staff, Executive and Legislative Affairs, Communications staff, as well as Enterprise Services. Business requirements include financial management systems & operations, workforce management, information technology, facility management, and personnel security services. Funds are also provided to the WCF, which provides services such as rent and information technology infrastructure support.

Salaries, Benefits and Detailees: Includes resources for all CWMD Federal personnel compensation, and detailees including liaison personnel from Federal Partners, the Office of General Council, and Public Health Service Officers with chemical toxicology expertise.

Mission Support – PPA
Budget Authority and Obligations

Budget Authority *(Dollars in Thousands)*	FY 2018	FY 2019	FY 2020
Enacted/Request	**-**	**$83,321**	**$84,583**
Carryover and/or Recoveries (Actual/Estimates/Projections)	-	-	-
Rescissions to Current Year/Budget Year	-	-	-
Net Sequestered Resources	-	-	-
Reprogrammings/Transfers	-	-	-
Supplementals	-	-	-
Total Budget Authority	**-**	**$83,321**	**$84,583**
Collections – Reimbursable Resources	-	$520	$796
Total Budget Resources	**-**	**$83,841**	**$85,379**
Obligations (Actual/Estimates/Projections)	-	$83,841	$85,379
Personnel: Positions and FTE			
Enacted/Request Positions	-	248	248
Enacted/Request FTE	-	232	232
Onboard and Actual FTE; Includes Collections - Reimbursable Resources			
Onboard (Actual/Estimates/Projections)	-	248	248
FTE (Actual/Estimates/Projections)	-	232	232

Mission Support – PPA
Collections – Reimbursable Resources

Collections		FY 2018 Enacted			FY 2019 President's Budget			FY 2020 President's Budget		
(Dollars in Thousands)		Pos.	FTE	Amount	Pos.	FTE	Amount	Pos.	FTE	Amount
Department of Homeland Security - Federal Emergency Management Agency	**Source**	-	-	-	-	-	$260	-	-	$360
Department of Homeland Security - US Customs and Border Protection	**Source**	-	-	-	-	-	$260	-	-	$260
Office of the Director of National Intelligence	**Source**	-	-	-	-	-	-	-	-	$176
Total Collections		**-**	**-**	**-**	**-**	**-**	**$520**	**-**	**-**	**$796**

Mission Support – PPA
Summary of Budget Changes

Budget Formulation Activity *(Dollars in Thousands)*	Positions	FTE	Amount
FY 2018 Enacted	-	-	-
FY 2019 President's Budget	**248**	**232**	**$83,321**
FY 2020 Base Budget	**248**	**232**	**$83,321**
Transfer to CWMD/MS from MGMT/OCSO for Background Investigations	-	-	$111
Transfer to MGMT/OCFO from CWMD/MS for Bankcard Program	-	-	($3)
Transfer to MGMT/OCFO from CWMD/MS for Integrated Audit	-	-	($25)
Transfer to MGMT/OCFO from CWMD/MS for TIER	-	-	($210)
Transfer to MGMT/OCIO from CWMD/MS for CPIC	-	-	($122)
Total Transfers	-	-	**($249)**
FERS Agency Contribution Increase	-	-	$729
National Capital Region Infrastructure Operations (NCRIO) Sustainment	-	-	$782
Total, Pricing Increases	-	-	**$1,511**
Total Adjustments-to-Base	-	-	**$1,262**
FY 2020 Current Services	**248**	**232**	**$84,583**
FY 2020 Request	**248**	**232**	**$84,583**
FY 2019 To FY 2020 Change	-	-	**$1,262**

Mission Support – PPA
Personnel Compensation and Benefits

Pay Summary

Organization (Dollars in Thousands)	FY 2018 Enacted				FY 2019 President's Budget				FY 2020 President's Budget				FY 2019 to FY 2020 Total			
	Pos.	FTE	Amount	Rate	Pos.	FTE	Amount	Rate	Pos.	FTE	Amount	Rate	Pos.	FTE	Amount	Rate
Mission Support	-	-	-	-	248	232	$46,308	$180.34	248	232	$47,037	$183.48	-	-	$729	$3.14
Total	**-**	**-**	**-**	**-**	**248**	**232**	**$46,308**	**$180.34**	**248**	**232**	**$47,037**	**$183.48**	**-**	**-**	**$729**	**$3.14**
Discretionary - Appropriation	-	-	-	-	248	232	$46,308	$180.34	248	232	$47,037	$183.48	-	-	$729	$3.14

Pay by Object Class

Pay Object Classes (Dollars in Thousands)	FY 2018 Enacted	FY 2019 President's Budget	FY 2020 President's Budget	FY 2019 - FY 2020 Change
11.1 Full-time Permanent	-	$31,697	$31,697	-
11.5 Other Personnel Compensation	-	$462	$462	-
11.8 Special Personal Services Payments	-	$4,469	$4,469	-
12.1 Civilian Personnel Benefits	-	$9,680	$10,409	$729
Total - Personnel Compensation and Benefits	**-**	**$46,308**	**$47,037**	**$729**
Positions and FTE				
Positions - Civilian	-	248	248	-
FTE - Civilian	-	232	232	-

Pay Cost Drivers

Leading Cost-Drivers *(Dollars in Thousands)*	FY 2018 Enacted			FY 2019 President's Budget			FY 2020 President's Budget			FY 2019 to FY 2020 Total Changes		
	FTE	Amount	Rate	FTE	Amount	Rate	FTE	Amount	Rate	FTE	Amount	Rate
Mission Support Personnel Compensation and Benefits	-	-	-	65	$10,090	$155	65	$10,266	$158	-	$176	$3
Mission Personnel Compensation and Benefits				167	$31,749	$190	167	$32,302	$193	-	$553	$3
Detailees				-	$4,469	-	-	$4,469	-	-	-	-
Total – Pay Cost Drivers	**-**	**-**	**-**	**232**	**$46,308**		**232**	**$47,037**		**-**	**$729**	**$3**

Explanation of Pay Cost Drivers

Mission Support Personnel Compensation and Benefits: This cost driver supports personnel compensation, benefits and performance awards for Federal employees indirectly facilitating the operations and mission of CWMD. They include Front Office personnel and those in Enterprise Services such as business, administrative, communications, facilities management, security, and finance personnel.

Mission Personnel Compensation and Benefits: This cost driver supports personnel compensation, benefits and performance awards for Federal employees who are direct mission-focused personnel.

Detailees: This cost driver provides funding for personnel detailed from DHS Operational Components, Office of General Council, Health and Human Services Public Health Service Officers (PHSOs), and other interagency partners.

Mission Support – PPA
Non Pay Budget Exhibits

Non Pay Summary

Organization *(Dollars in Thousands)*	FY 2018 Enacted	FY 2019 President's Budget	FY 2020 President's Budget	FY 2019 to FY 2020 Total Changes
Mission Support	-	$37,013	$37,546	$533
Total	**-**	**$37,013**	**$37,546**	**$533**
Discretionary - Appropriation	-	$37,013	$37,546	$533

Non Pay by Object Class

Non-Pay Object Classes *(Dollars in Thousands)*	FY 2018 Enacted	FY 2019 President's Budget	FY 2020 President's Budget	FY 2019 to FY 2020 Change
21.0 Travel and Transportation of Persons	-	$206	$206	-
23.1 Rental Payments to GSA	-	$11,722	$11,722	-
24.0 Printing and Reproduction	-	$27	$27	-
25.1 Advisory and Assistance Services	-	$11,431	$11,431	-
25.2 Other Services from Non-Federal Sources	-	$445	$445	-
25.3 Other Goods and Services from Federal Sources	-	$8,888	$8,639	($249)
25.7 Operation and Maintenance of Equipment	-	$3,825	$4,607	$782
26.0 Supplies and Materials	-	$234	$234	-
31.0 Equipment	-	$235	$235	-
Total - Non Pay Object Classes	**-**	**$37,013**	**$37,546**	**$533**

Non Pay Cost Drivers

Leading Non Pay Cost-Drivers *(Dollars in Thousands)*	FY 2018 Enacted	FY 2019 President's Budget	FY 2020 President's Budget	FY 2019 to FY 2020 Total Changes
Rental Payments to GSA	-	$10,996	$9,175	($1,821)
IT Operations (NCRIO & CLAN)	-	$6,758	$6,832	$74
Financial Systems	-	$6,619	$6,329	($290)
Financial System Support	-	$3,170	$3,100	($70)
Other Mission Support Costs	-	$9,470	$12,110	$2,640
Total – Non Pay Cost Drivers	**-**	**$37,013**	**$37,546**	**$533**

Explanation of Non Pay Cost Drivers

Rental Payments to GSA: The costs associated with Rental Payments to General Services Administration (GSA) reflect the current WCF assessment that includes savings from the consolidation of DNDO and OHA spaces. Rent costs to support CWMD information and analysis coordination and partnership personnel at critical sites are not yet incorporated into the WCF and are shown as part of the other mission support line below.

IT Operations (NCRIO & CLAN): Reflects the CWMD charges via the WCF for the National Capital Region Information Operations (to include allocated costs for CWMD share of the unclassified Local Area Network (LAN), computers, phone service, printers, cell phones, and help desk support). It also includes costs for the CWMD allocated costs for the classified LAN (CLAN). Costs to support CWMD information and analysis coordination and partnership personnel at critical sites are not yet incorporated into the WCF and are shown as part of the other mission support line below.

Financial Systems: This cost driver support the financial systems for CWMD as well as legacy OHA and DNDO prior year obligations. It includes the cost for ICE Federal Financial Management System (FFMS) and the DHS Financial Systems Modernization Solution (FSMS).

Financial Systems Support: Includes the costs for U.S. Coast Guard Finance Center (FINCEN), FFMS provider (ICE) service level agreement, FSMS licenses (Oracle licenses) and FSMS integration costs to the DHS travel management system.

Other Mission Support Costs: This includes costs for supplies, materials, enterprise service and business support, DHS shared services, printing and reproduction, travel, training of personnel, facility support, and reception. The change supports planned increases for rent and overhead costs for the CWMD Information and Analysis coordination and partnership personnel at critical sites such as the NTC and the National Operations Center.

Capability and Operations Support – PPA

Budget Comparison and Adjustments

Comparison of Budget Authority and Request

Organization (Dollars in Thousands)	FY 2018 Enacted			FY 2019 President's Budget			FY 2020 President's Budget			FY 2019 to FY 2020 Total Changes		
	Pos.	FTE	Amount	Pos.	FTE	Amount	Pos.	FTE	Amount	Pos.	FTE	Amount
Capability and Operational Support	-	-	-	-	-	$125,943	-	-	$127,990	-	-	$2,047
Total	**-**	**-**	**-**	**-**	**-**	**$125,943**	**-**	**-**	**$127,990**	**-**	**-**	**$2,047**
Subtotal Discretionary - Appropriation	-	-	-	-	-	$125,943	-	-	$127,990	-	-	$2,047

PPA Level I Description

The Capability & Operational Support (C&OS) PPA provides situational awareness and decision support for DHS leadership and Federal partners; the development of CWMD capabilities through strategic planning and analysis; assisting DHS Operational Components and other agencies in defining requirements necessary to achieve their mission; and the procurement, testing, and evaluation of CWMD equipment. CWMD supports components and other agencies through the definition of requirements, ensuring an efficient test and evaluation program, and the procurement of chemical/biological and radiological/nuclear detection equipment that can be carried, worn, or easily moved to support operational end-users. CWMD manages and supports bio-detection systems, coordinates DHS biological defense activities, provides biosurveillance information, and supports preparedness for biological and chemical events to help communities build capabilities to prepare, respond, and recover. C&OS also supports bio-detection in more than 30 jurisdictions including, laboratory analysis and support, consumables, reagents, and local quality checks.

Program Descriptions

Strategic Planning & Analysis: Ensures that CWMD planning, policies, and strategies for the nuclear, chemical, radiological, and biological mission areas are aligned to CWMD operational requirements and priorities. Activities include the development of coordinated strategies, plans, and policy recommendations to counter WMD, coordination of chemical, biological or integrated terrorism risk assessments, hazard, or material threat assessments and operational readiness against chemical, biological, radiological, nuclear threats. CWMD provides mission area information to support the DHS Office of Intelligence and Analysis' process to provide senior leaders with the most current and accurate WMD threat information available at any level of classification. CWMD coordinates with the Science & Technology Directorate and interagency partners on research and development requirements as necessary. This program contains Strategic Planning and Analysis, National Biosurveillance Integration Center (NBIC), as well as CWMD Information Analysis and Anomaly Detection.

Strategic Planning and Analysis provides necessary support to develop and coordinate strategies, plans, policy, and requirements on behalf of the Department of Homeland Security on WMD, health security, and related matters as well as conducts CWMD capability architecture analysis and manages CWMD capability gaps. Strategic Planning and Analysis program has seven main projects as follows:

Strategy, Policy and Planning Support Project provides support to CWMD and DHS for CWMD policy coordination for DHS and Strategic and implementation planning for DHS and CWMD Office. This effort includes support for Department wide planning efforts such as the Northern Border Strategy Implementation Plan and the Southern Border and Approaches Campaign Plan. Department-wide and multi-component steady state and contingency planning which includes support for In-Bound CWMD Threat Plan and the Non-Combatant Evacuation Operation (NEO) Plan; and White House engagement and coordination.

Threat and Hazard Identification and Risk Assessment (THIRA) and Stakeholder Preparedness Report (SPR) Chemical, Biological, Radiological, and Nuclear (CBRN) Technical Assistance project. Develop CBRN assistance materials and training for State and local operators and planners to support the THIRA and Stakeholder Preparedness Report (SPR) process, including evaluating the CBRN threat, identifying desired CBRN detection capabilities, and enabling State and local access to Federal Emergency Management Administration (FEMA) preparedness grant funds. This work should also collect requirements to inform future CWMD assistance initiatives, setting the foundation for the development of additional analytical tools and technical assistance services.

International Partner Engagement Support Project engage with international partners to establish or improve CWMD prevention and detection capabilities along critical pathways and to increase information sharing in an effort to identify threats and vulnerabilities as early and far from the U.S. border as practicable. This effort will be achieved by leveraging US Government partners to build sustainable capability in priority nations, developing and maintaining cooperative relationships with critical partners along proliferation pathways, and share information with priority partners and conduct joint activities.

Requirements, Capabilities, Generation & Management (RCGM) Support Project will manage gap assessments for more than 42 CWMD projects and over 152 gaps. Support staff will assist in developing documentation for Chemical, Bio, and Food, Agriculture and Veterinary (FAV) gaps through workshops, Integrated Product/Project/Program Teams (IPTs), and other collaborative efforts.

Architecture Planning and Capability Analysis support project includes system architects who provide foundational architectural products based on the Department of Defense (DOD) Architecture Frameworks that have been incorporated into the DHS acquisition process. This includes various strategic and operational products, most familiar being the OV-1 or Operational View. These products provide the "picture" and context to decision makers to support decisions by illustrating the Who, What, When, Why and How with respect to an operation, a new technology deployment, a potential new concept at varying degrees of specificity. Analysts provide the core team of analysts who conduct Stage 0 support analysis, coordinate with operational partners in identifying operational gaps/requirements (DOTMLPF+RGS analysis), determine high level Courses of Action (COA) to address/mitigate gaps and provide recommendations on the need for additional analytical support or respond to internal and external requests for capability based assessments. These analysts shape the various analytical reports to provide the initial traceability of gap/requirement to ensure that there is supportable data to justify resourcing and the subsequent development of supporting acquisition documentation.

National Biosurveillance Integration Center enhances the capability of the Federal Government to rapidly identify, characterize, localize, and track biological events of national concern. NBIC disseminates information to enhance the ability of member agencies and State, local, and tribal governments to respond to biological events of national concern.

CWMD Information Analysis and Anomaly Detection is developing a robust and technologically advanced analytic capability to combat the threats from chemical, biological, radiological, and nuclear threats to the homeland and our interests. This effort will provide operationally-focused WMD intelligence, sensor data interpretation and tool integration, operational integration with Departmental field operations, and DoD/IC/IA/Foreign Partner collaboration.

The Vision of the Five Year Analytic Support End-State: A fully integrated, operator-focused analytical support program that protects Americans by providing early warning and timely detailed analyses to DHS leadership, operators, Federal interagency partners and State, local, tribal, and territorial (SLTT) responders in order to effectively reduce the risk of WMD threats–both man-made and naturally occurring–to include significant biological threats.

In December 2017, DHS established CWMD in order to counter attempts by terrorists or other threat actors to carry out an attack against the United States or its interests using a weapon of mass destruction. CBRN threats come from a variety of origins including intentional, accidental, or natural disaster releases; adulteration of products for economic gain; and naturally occurring disease outbreaks. With this challenging mission it is imperative that the CWMD develop a robust and technologically advanced analytic capability to combat CBRN threats to the homeland and our interests. Building off environmental radiation and biological detection and biosurveillance programs, CWMD will expand the integration and analysis of CBRN threat information and quickly deliver that information into the hands of DHS Operational Components and other local first responders.

The primary function of CWMD is to provide the support necessary for our operational partners to identify threat actors, determine the levels of threat from manmade or naturally occurring CWMD or biological incidents and deliver the required decision information to prevent and respond to the use of WMD and naturally occurring threats to the homeland. The CWMD analysts work with DHS Components and other local first responders to understand the current processes, capabilities, and functions that our customers rely upon to meet this threat. This support consists of four fundamental objectives:

1. Understanding the Environment and Evaluating Threats based on adversary capabilities and tactics techniques and procedures;
2. Identifying the Pathways, the Associated Vulnerabilities and Anomalies that could be exploited for the development and delivery of WMD;
3. Effectively Integrating Data to ensure data integrity and ease of use, and
4. Assisting in the Development of Supporting Tools and Infrastructure.

Readiness Program – Operational Preparedness & Assessments: The Readiness-Operational Preparedness & Assessments program funds the Net Assessments and Field Training projects. The Net Assessment project performs objective reviews of the effectiveness of CWMD programs in delivering intended capability to the field by examining internal protocols, policies, and procedures. The Field Training projects help ensure DHS Operational Components, domestic first responder agencies, and international law enforcement and incident response agencies are ready to perform the WMD detection mission effectively and efficiently. This includes hands-on instruction in the effective use of approved concepts of operation (CONOPS) and tactics, techniques, and procedures (TTP), as well as the efficient use of available detection capability resources.

Net Assessments employ a systems approach to integrate functions, activities, and programs across the enterprise, and establishes obtainable strategic goals and metrics. Field Training directly coordinates with operational partners to identify and prioritize capability gaps that are actionable; helps CWMD institutionalize an operations support focus and culture by working directly with DHS components, domestic operational partners, and international operational partners who counter WMD to assess detection operations; helps CWMD measure progress against increases in fielded operational capabilities by evaluating the effectiveness of local CONOPS/TTP and efficient use of equipment; and helps integrate pathway-based S&L detection capabilities with other response activities by stressing and assessing coordination points during threat scenarios. Funding for these functions is not requested in FY 2020 due to other higher CWMD priorities.

Medical and Food, Agriculture, and Veterinarian Support: Provides expertise and activities to advise DHS leadership about health security issues, and coordinates with the medical first responder community and other stakeholders at all levels of government to prepare for, respond to, and recover from mass casualty incidents and health consequences of terrorism and disasters. Medical support provides oversight and policy for DHS operational Emergency Medical Services (EMS) activities, including emergency care services provided for people in DHS care and custody. Food, Agriculture and Veterinary Resilience (FAVR) support coordinates the Department's efforts related to defending U.S. food, agriculture, and veterinary systems The Radiation Safety Program (RSP) focuses on supporting the Headquarters and Operational Components with radiation hazard identification, developing plans and policies, and providing expert guidance on the effects of ionizing radiation on people, plants, animals, and the environment.

Office of the Chief Medical Officer (CMO) and Operational Medicine

- *Chief Medical Officer*. CMO serves as the principal advisor to the Secretary and Department leadership on health and medical issues; coordinates among DHS Operational Components, Federal interagency partners, the medical community, and SLTT partners with respect to medical and public health matters.
- *Operational Medicine.* CMO oversees DHS medical support operations, such as the DHS EMS system and medical surge support along the Southwest Border; and provides senior medical liaison officers in Operational Components. The CMO is exploring the enhancement of medical oversight capability and operational medical support through a regional network of medical advisors and technical experts.
- *DHS Emergency Medical Services (EMS)*. CWMD administers the DHS EMS system, which includes the standardization and alignment of EMS credentialing, education, protocols, requirements, and training. DHS participates in national and Federal standards processes for EMS systems development.
- *Health Information Systems.* CWMD is implementing a consolidated electronic patient care record (ePCR) system to document pre-hospital patient care to be used by EMS providers. The CMO is also exploring the feasibility of implementing DHS-wide a health record data system

currently used by ICE. A DHS enterprise-wide data system for medical information will support the CMO's responsibility for overseeing and directing operational medicine for the Department.

- *First Responder Vaccination Initiative*. CWMD is implementing the vaccination pilot program as required by P.L. 114-268.

Food, Agriculture and Veterinary Resilience (FAVR) support represents the Department's compliance with the statutory responsibility in the *Securing our Agriculture and Food Act* (P.L. 115-43). The Secretary, acting through the Assistant Secretary for CWMD, shall carry out a program to coordinate the Department's efforts related to defending the food, agriculture, and veterinary systems of the United States against terrorism and other high-consequence events that pose a high risk to homeland security. Public Law 115-43 charges DHS with: 1) Providing oversight and management of the Department's responsibilities. 2) Providing oversight and integration of the Department's activities related to veterinary public health, food defense, and agricultural security. 3) Leading the Department's policy initiatives relating to food, animal, and agricultural incidents, and the impact of such incidents on animal and public health. 4) Leading the Department's policy initiatives relating to overall domestic preparedness for and collective response to agricultural terrorism. 5) Coordinating with other Department components, including U.S. Customs and Border Protection, as appropriate, on activities related to food and agriculture security and screening procedures for domestic and imported products. 6) Coordinating with appropriate Federal departments and agencies.

The Radiation Safety Program (RSP) focuses on supporting the headquarters and operational Components with respect to the identification of hazards, development of plans and policies, and subject matter expertise on the effects of ionizing and non-ionizing radiation on people and the environment. The threats and hazards that are the focus of the RSP are those that involve radiation and radioactive materials. They include Radiological Dispersal Devices (RDDs), Radiation Emitting Devices (REDs), Improvised Nuclear Devices (INDs), and other incidents (accidental or purposeful) involving radiation and/or radioactive materials. RSP will plan, prepare and execute activities in coordination with DHS components and other Federal, State, and local partners to include establishing and maintaining a Nuclear Regulatory Commission (NRC) Radioactive Materials License, if necessary to support operations. RSP looks for opportunities to share information, develop synergies by leveraging partner capability and capacity, and minimize redundancy.

Chemical Support: Supports operator-focused projects that optimize the sharing and analysis of information (data) towards disrupting potential incidents (recognition/detection), enhance rapid decision-making throughout prevention, protection and response mission space, and provide training and education to Federal and local first responders on current, emerging and forecasted chemical threats. CWMD intends to continue its chemical support capability, in coordination with partners such as the Chemical Security Analysis Center (CSAC), to better defend the Homeland against the threat of chemical terrorism.

CWMD's Chemical Defense Program is uniquely positioned to support communication, collaboration and coordination within the larger national chemical defense enterprise (i.e., government, academia, private sector, non-governmental organizations). The collective activities not only directly address the National Security Strategy and National Preparedness Goal, but also promote all-hazards resiliency as many processes are applicable beyond the chemical threat. Specifically, the Chemical Support Program:

- Advises and provides subject matter expertise to the Secretary of Homeland Security, CWMD leadership, and other Federal executive leadership on current, emerging and forecasted threats, vulnerabilities, impacts, health security, and other chemical defense concerns.
- Provides oversight and management of DHS chemical threat-related responsibilities under applicable executive orders and policies.
- Advises, supports and collaborates to provide subject matter expertise to DHS operational and support Components, Federal interagency, and whole community, on current, emerging and forecasted threats, vulnerabilities, impacts, health security, and other chemical defense concerns.
- Provides oversight and integration of DHS activities relating to chemical defense.
- Procures data, generates requirements and conducts policy impact analysis through the lens of the end user and develops evidence-based, validated technological and non-technological solutions that target gaps and emergent needs focused on buying down risk.
- Develops capabilities and sustainment programs, or leverages existing capabilities, to integrate solutions into the chemical defense enterprise, including evaluation of projects and activities to determine effectiveness, eliminate redundancies, and verify a chain of accountability.

Biological Support: Biological Support programs fund aspects of national bio-detection oversight, collector siting and operational support; equipment, consumables, assays, and reagents; and quality assurance and quality control. Program activities include modeling of operational or impact scenarios, subject matter reachback, development of reference materials, information-sharing activities, as well a rapidly deployable, special event support. Specifically, this program:

- Provides technical and programmatic support for the establishment and maintenance of Situational Awareness for Federal, State, and local level program participants. Provides a Common Operating Picture that supports presentation of network status in routine day-to-day operations, and facilitates timely execution of coordinated response activities during detection events, both of which are necessary as part of the national security architecture.
- Provides material and expertise in maintaining a widespread aerosol collection capability and the capability to analyze samples for the presence of bioterrorism and other agents of interests. Maintains the operational structure of the program at the State and local level. Early detection of an event enables treatment of potentially exposed citizens before they develop disease symptoms, enabling many more lives to be saved. DHS-funded field operations (supported in the Federal Assistance Appropriation) significantly reduce the financial burden on the State/local jurisdictions' limited public health and emergency preparedness budgets, which otherwise would not likely be able to maintain this capability.
- Provides technical and programmatic support to the Field Detection Operations. Maintains information, systems, quality assurance, and preparedness and response capabilities necessary for an effective detection system as part of the national security architecture.

The BioWatch Program is the Nation's only civilian-operated biodetection and response program. It is charged with working with Federal, State, local, and tribal governments to prepare a rapid efficient response to a wide spread bioterrorism attack, conduct environmental surveillance to provide early warning that the attack has occurred and oversee initial situational awareness and response at all levels of government. The BioWatch program is consistent with strategies that cite early detection and response as key to mitigating the effects of an act of bioterrorism, Biodefense for the 21st Century, 2014 Quadrennial Homeland Security Report, National Strategy for Countering Bio Threats, and National Strategy for Bio Surveillance and the Blue Ribbon Panel.

Technical Forensics: This program advances the science of nuclear forensics through the examination of materials recovered from radiological/nuclear events of an illicit or hostile nature, in order to determine their character and origin for legal proceedings or national security. In addition, this program ensures forensics readiness through joint planning, working with other agencies to conduct exercise and assess capabilities, and promoting international engagements.

The Technical Forensics program: 1) Supports technology development by exercising operational capabilities and assisting in identifying gaps for future development efforts; 2) Supports operational testing of technologies under development to ensure technologies can perform under operational conditions; and 3) Coordinates R&D efforts informed by high level policy guidance, legislation, and pre-eminent scientific expertise. The Technical Forensics Capability Assessment, along with the R&D efforts, support our operational partners' needs and capabilities, help maintain a viable workforce, and focus the efforts of our students and universities, all of which are connected to a strong exercise program.

Test & Evaluation (T&E): Provides funds to characterize, verify, and validate technical performance, and assess the operational effectiveness and suitability of chemical, biological, and R/N detection technologies under development, as well as that of commercially available systems, and emerging technologies and systems prior to deployment (full operational capability). CWMD utilizes a suite of test instrumentation and automated data collection systems to enable testing teams to rapidly verify and validate data. The Standards project follows a development, use, and revision cycle to ensure consensus and technical capability standards remain effective for detection technology.

Test and Evaluation supports CWMD programs by conducting tests and evaluations to determine technological maturity, effectiveness, suitability, and compliance with cybersecurity requirements. The five projects in T&E are T&E Operations, Operational Analysis and Technical Assessments (OATA), Sources and Infrastructure, Standards and Conformity, and Directed Test.

T&E Operations implement innovative methods to scale test execution based upon the maturity, complexity and cost of the technology under test. This includes actions to: identify and implement T&E best practices for supporting Rapid Acquisition Programs; incorporate best T&E practices into the T&E Operational Instruction; deliver T&E solutions for both rapid and conventional acquisitions; evaluate technical maturity of materiel solutions in support of their transfer from R&D to Acquisition; development T&E, operational T&E, and regression testing for deployed capabilities.

T&E Operational Analysis and Technical Assessments supports the Data Mining, Analysis, and Modeling Cell (DMAMC). The DNAMC is a unique resource that optimizes the use of CWMD's existing knowledge base to improve efficiency of test planning and execution, address questions of detector performance through the reuse and evaluation of existing data, and shift the reliance on testing only when needed to acquire new knowledge. It has consolidated and built a number of databases and libraries that feature common, controlled access and ease reuse of CWMD data, and DMAMC personnel are vital resources for using these databases. Projects funded directly by DMAMC cut across programs and past tests to ensure CWMD maintains a comprehensive view of its detector knowledge base. DMAMC allows CWMD to respond to requests for information from stakeholders that require such cross-cutting analyses.

Sources and Infrastructure supports the maintenance and sustainment of testing infrastructure, in order to promote efficiencies, cost savings, consistency and robustness across all types of test and evaluation events. This infrastructure includes, but is not limited to the design/fabrication of Special Nuclear Material sources, fissile material handling, data collection systems, specialized testing equipment, models, and data repositories to

allow for the reuse of data. The FY 2018 budget included funds to complete Reactor Grade Plutonium (RGPu), Weapons Grade Plutonium (WGPu) and Highly Enriched Uranium (HEU) sources. There are no further plans to fabricate additional sources beyond FY 2019. The FY 2018 budget also included funds to develop and maintain testing infrastructure such as reference detectors, data repositories and data collection systems. The FY 2020 funding level for Sources and Infrastructure reflects a transition from development to sustainment of the majority of the testing infrastructure.

The Standards & Conformity effort supports performance standards for radiological and nuclear detection systems. The program provides funding for the development and maintenance of American National Standards Institute (ANSI) Standards, Technical Capability Standards (TCS), and International Electro-technical Commission (IEC) Standards, and associated Conformity Testing against the criteria in those standards. The standards serve as the premier benchmark criteria for rad/nuc detection system capability requirements. Technical Capability Standards are directed by the *Safe Port Act of 2006*. Voluntary consensus standards establish baseline performance requirements, provide a means to verify those requirements are met, and help promote development and revision of detection equipment for operational government users, law enforcement, and other State and local users.

The Directed Test Program conducts T&E activities, which in turn supports CONOPS development/refinement, training and procurements of Federal and local first responders. In addition, Directed Testing supports the development, validation, and harmonization of radiological/nuclear detection standards. Ten Directed Tests have been conducted to date. The Assistant Secretary shall approve each future Directed Test, with concurrence from the Weapons of Mass Destruction Requirements Oversight Council (WROC). The Directed Test program directly and indirectly supports strategic investments into the Global Nuclear Detection Architecture (GNDA) that help to build and strengthen capabilities and to close gaps against R/N threats.

Acquisition: The CWMD Acquisition Program within the Capability and Operations Support PPA supports the procurement of sensors, detectors, and equipment that have an end item unit cost of less than $250,000. This program includes the RPM program, Special Mission Support and Sensor Capability Deployment that acquires and deploys human portable, mobile, or relocatable detection equipment to address capability gaps for operational users. This program also includes limited sustainment of sensors, detectors and/or equipment that CWMD provides to support DHS Components and other first responders.

Radiation Portal Monitor Program (RPMP) supports CBP's operational fleet of RPM systems at the Nation's land, sea, and air ports of entry (POE). RPMs provide the capability to cost-effectively scan cargo for R/N threats at land, sea, and air POEs without an adverse impact to the flow of commerce. The RPMP has reached Full Operating Capability (FOC) with the objective to maintain scanning coverage at previously deployed sites. Major activities include: Decommission low-use/no-use RPMs and reconfigure sites as required; redeploy previously decommissioned and refurbished RPMs as necessary to address required level of scanning capability at sites; deploy additional large-scale systems at POEs or between POEs in the vicinity of the border; deploy improvements to fielded systems; and conduct test and evaluation of improvements.
Sensor Capability Deployment acquires and deploys CWMD sensor capabilities that typically evolve from late-stage technology readiness level projects or are modified commercially available devices. The devices are chemical, biological, and radiological detection equipment that can be carried, worn, or easily moved to support operational end-users. This project includes Personal Radiation Detectors (PRD); Basic Handheld (BHH) Radioisotope Identification Devices (RIID); and next-generation CWMD sensors required to address identified capability gaps, such as multi-modal devices, wireless network-capable devices or ancillary equipment that enables wireless network connectivity, and chemical detectors. For next-

generation sensors, ongoing capability needs analysis will drive specific materiel solutions. For currently-deployed CWMD sensors, this program will assess and deploy, as appropriate, upgrades or ancillary equipment that will enable wireless connectivity to enable data streaming for improved situational awareness and targeting capability.

Special Mission Support will provide COTS/GOTS capabilities to various component Special Mission Units to increase and/or recapitalize their CWMD equipment and/or sustainment of that equipment to bolster their CWMD mission area. This project will support prototyping and rapid procurement efforts focused on concept-through-deployment activities to support immediate and near-term needs.

Capability and Operations Support – PPA
Budget Authority and Obligations

Budget Authority *(Dollars in Thousands)*	FY 2018	FY 2019	FY 2020
Enacted/Request	**-**	**$125,943**	**$127,990**
Carryover and/or Recoveries (Actual/Estimates/Projections)	-	$3,701	-
Rescissions to Current Year/Budget Year	-	-	-
Net Sequestered Resources	-	-	-
Reprogrammings/Transfers	-	-	-
Supplementals	-	-	-
Total Budget Authority	**-**	**$129,644**	**$127,990**
Collections – Reimbursable Resources	-	$800	$829
Total Budget Resources	**-**	**$130,444**	**$128,819**
Obligations (Actual/Estimates/Projections)	-	$130,444	$128,819
Personnel: Positions and FTE			
Enacted/Request Positions	-	-	-
Enacted/Request FTE	-	-	-
Onboard and Actual FTE; Includes Collections - Reimbursable Resources			
Onboard (Actual/Estimates/Projections)	-	-	-
FTE (Actual/Estimates/Projections)	-	-	-

Capability and Operations Support – PPA
Collections – Reimbursable Resources

Collections		FY 2018 Enacted			FY 2019 President's Budget			FY 2020 President's Budget		
(Dollars in Thousands)		Pos.	FTE	Amount	Pos.	FTE	Amount	Pos.	FTE	Amount
Department of Defense - Department of Defense	**Source**	-	-	-	-	-	$524	-	-	$524
Department of Defense - Navy, Marine Corps	**Source**	-	-	-	-	-	$75	-	-	$100
Department of Homeland Security - Departmental Management and Operations	**Source**	-	-	-	-	-	$201	-	-	$205
Total Collections		**-**	**-**	**-**	**-**	**-**	**$800**	**-**	**-**	**$829**

Capability and Operations Support – PPA
Summary of Budget Changes

Budget Formulation Activity *(Dollars in Thousands)*	Positions	FTE	Amount
FY 2018 Enacted	-	-	-
FY 2019 President's Budget	-	-	**$125,943**
FY 2020 Base Budget	-	-	**$125,943**
Transfer to O&S from PC&I for Radiation Portal Monitor Program	-	-	$24,046
Transfer to R&D/Technical Forensics from O&S/C&OS	-	-	($2,600)
Total Transfers	-	-	**$21,446**
CWMD Sensor Capability Deployment Change	-	-	($200)
Total, Pricing Decreases	-	-	**($200)**
Total Adjustments-to-Base	-	-	**$21,246**
FY 2020 Current Services	-	-	**$147,189**
Special Mission Support	-	-	$2,000
Strategic Planning and Analysis	-	-	$2,000
Total, Program Increases	-	-	**$4,000**
Biological Support Reduction	-	-	($2,700)
Chemical Support Reduction	-	-	($5,000)
Radiation Portal Monitor (RPM) Decrease	-	-	($10,299)
Readiness - Operational Preparedness & Assessments Decrease	-	-	($5,200)
Total, Program Decreases	-	-	**($23,199)**
FY 2020 Request	-	-	**$127,990**
FY 2019 To FY 2020 Change	-	-	**$2,047**

Capability and Operations Support – PPA
Personnel Compensation and Benefits

Pay Summary

Organization (Dollars in Thousands)	FY 2018 Enacted				FY 2019 President's Budget				FY 2020 President's Budget				FY 2019 to FY 2020 Total			
	Pos.	FTE	Amount	Rate	Pos.	FTE	Amount	Rate	Pos.	FTE	Amount	Rate	Pos.	FTE	Amount	Rate
Capability and Operational Support	-	-	-	-	-	-	$2,297	-	-	-	$2,547	-	-	-	$250	-
Total	**-**	**-**	**-**	**-**	**-**	**-**	**$2,297**	**-**	**-**	**-**	**$2,547**	**-**	**-**	**-**	**$250**	**-**
Discretionary - Appropriation	-	-	-	-	-	-	$2,297	-	-	-	$2,547	-	-	-	$250	-

Pay by Object Class

Pay Object Classes (Dollars in Thousands)	FY 2018 Enacted	FY 2019 President's Budget	FY 2020 President's Budget	FY 2019 - FY 2020 Change
11.8 Special Personal Services Payments	-	$2,297	$2,547	$250
Total - Personnel Compensation and Benefits	**-**	**$2,297**	**$2,547**	**$250**
Positions and FTE				

Pay Cost Drivers

Leading Cost-Drivers *(Dollars in Thousands)*	FY 2018 Enacted			FY 2019 President's Budget			FY 2020 President's Budget			FY 2019 to FY 2020 Total Changes		
	FTE	Amount	Rate	FTE	Amount	Rate	FTE	Amount	Rate	FTE	Amount	Rate
Public Health Service Officer Costs	-	-	-	-	$2,297	-	-	$2,282	-	-	($15)	-
Total – Pay Cost Drivers	**-**	**-**	**-**	**-**	**$2,297**	**-**	**-**	**$2,282**	**-**	**-**	**($15)**	**-**

*The pay rate calculation does not include object classes 11.8 or 13.

Explanation of Pay Cost Driver

Public Health Service Officer Costs: The table above displays the reimbursable payments (Object Class 11.8, "Special Personal Services Pay") that support personnel from the Health and Human Services (HHS), U.S. Public Health Service Corps only. CWMD has Public Health Service Officers (PHSO) detailed from HHS helping staff with CWMD programs. There are no positions reflected here, since the PHSO positions are held by HHS. CWMD personnel providing expertise for chemical defense are funded from the Mission Support PPA and not included in this table.

Capability and Operations Support – PPA
Non Pay Budget Exhibits

Non Pay Summary

Organization *(Dollars in Thousands)*	**FY 2018 Enacted**	**FY 2019 President's Budget**	**FY 2020 President's Budget**	**FY 2019 to FY 2020 Total Changes**
Capability and Operational Support	-	$123,646	$125,443	$1,797
Total	**-**	**$123,646**	**$125,443**	**$1,797**
Discretionary - Appropriation	-	$123,646	$125,443	$1,797

Non Pay by Object Class

Non-Pay Object Classes *(Dollars in Thousands)*	**FY 2018 Enacted**	**FY 2019 President's Budget**	**FY 2020 President's Budget**	**FY 2019 to FY 2020 Change**
21.0 Travel and Transportation of Persons	-	$1,469	$1,241	($228)
23.3 Communications, Utilities, and Misc. Charges	-	-	$301	$301
24.0 Printing and Reproduction	-	$4	$28	$24
25.1 Advisory and Assistance Services	-	$39,045	$38,060	($985)
25.2 Other Services from Non-Federal Sources	-	$17,718	$18,318	$600
25.3 Other Goods and Services from Federal Sources	-	$39,258	$28,394	($10,864)
25.7 Operation and Maintenance of Equipment	-	$1,142	$1,259	$117
26.0 Supplies and Materials	-	$11,200	$11,200	-
31.0 Equipment	-	$13,160	$26,592	$13,432
41.0 Grants, Subsidies, and Contributions	-	$650	$50	($600)
Total - Non Pay Object Classes	**-**	**$123,646**	**$125,443**	**$1,797**

Non Pay Cost Drivers

Leading Non Pay Cost-Drivers *(Dollars in Thousands)*	FY 2018 Enacted	FY 2019 President's Budget	FY 2020 President's Budget	FY 2019 to FY 2020 Total Changes
Biological Support	-	$49,546	$46,861	($2,685)
Acquisition	-	$25,200	$40,747	$15,547
Strategic Planning and Analysis	-	$16,800	$18,800	$2,000
Other Costs	-	$32,100	$19,300	($12,800)
Total – Non Pay Cost Drivers	**-**	**$123,646**	**$125,708**	**$2,062**

Explanation of Non Pay Cost Drivers

Biological Support: Provides BioDetection capability for aerosolized biological threats, in conjunction with the funds provided as Federal assistance through cooperative agreements (via the Federal Assistance Appropriation). This program supports the Nation's only civilian operated biodetection and response program (BioWatch) and funds, collector siting and operational support; equipment, consumables, assays, and reagents; quality assurance and quality control: modeling of operational or impact scenarios: subject matter reach back: development of reference materials: information sharing activities: and rapidly deployable, special event support. The decrease reflects a reduction in program support activities.

Acquisition: Provides funding for procurement of chemical, biological, and radiological sensors, detectors, and equipment that have a unit cost of less than $250,000. This program includes the Radiation Portal Monitor (RPM) project, Special Mission Support, and Sensor Capability Deployment that acquires and deploys human portable, mobile, or relocatable detection equipment to address capability gaps for operational users. This program also includes limited sustainment of sensors, detectors and/or equipment that CWMD provides to DHS Components. The increase is driven by the transfer of the RPM project from PC&I.

Strategic Planning & Analysis: Strategic Planning and Analysis will provide resources for requirements, threat hazard identification and risk assessments, National Biosurveillance Integration Center, and information analysis and anomaly detection. The increase will provide funds for expanding the CWMD operationally-focused organization with specialized capabilities to organically execute the following key functions: provide operationally-focused WMD intelligence, sensor data interpretation and tool integration, biosurveillance, operational integration with Departmental field operations, & DoD/IC/IA/Foreign Partner collaboration.

Other Costs: Provides funding for: Readiness - Operational Preparedness & Assessments; Medical and Food, Agriculture, and Veterinarian Support; Chemical Support and Analysis; Technical Forensics, and Test and Evaluation. Decrease reflects reductions in Readiness, Chemical Support and Analysis and a transfer from Technical Forensics.

Department of Homeland Security

Countering Weapons of Mass Destruction

Procurement, Construction, and Improvements

Fiscal Year 2020
Congressional Justification

Table of Contents

Procurement, Construction, and Improvements
Budget Comparison and Adjustments

Comparison of Budget Authority and Request

Organization *(Dollars in Thousands)*	FY 2018 Enacted	FY 2019 President's Budget	FY 2020 President's Budget	FY 2019 to FY 2020 Total Changes
Assets and Infrastructure Acquisition	-	$74,896	$78,241	$3,345
Total	**-**	**$74,896**	**$78,241**	**$3,345**
Discretionary - Appropriation	-	$74,896	$78,241	$3,345

The Countering Weapons of Mass Destruction Office (CWMD) Procurement, Construction and Improvements (PC&I) appropriation provides resources necessary for the planning, operational development, engineering, purchase, and deployment of assets that help the Department of Homeland Security (DHS) and its partners to prevent, protect against, respond to, and mitigate nuclear, chemical, radiological, and biological threats and incidents.

PC&I funding enables CWMD to support the planning, operational development, engineering, and purchase of assets for the following Program, Project, and Activity (PPA):

Assets and Infrastructure Acquisition: The Assets and Infrastructure Acquisition PPA provides resources for CWMD to acquire and deploy large-scale detection systems or other related equipment to support DHS operational end-users and address the full scope of requirements. The PPA includes the procurement and/or deployment of systems at land border crossings, seaports, international airports (including international preclearance sites), and international mail and express consignment courier facilities, and provides the scientific and technical expertise to design, acquire, and deploy these systems. CWMD coordinates with operational partners to refine and prioritize equipment requirements.

Procurement, Construction, and Improvements
Budget Authority and Obligations

Budget Authority *(Dollars in Thousands)*	**FY 2018**	**FY 2019**	**FY 2020**
Enacted/Request	**-**	**$74,896**	**$78,241**
Carryover and/or Recoveries (Actual/Estimates/Projections)	-	$48,689	-
Rescissions to Current Year/Budget Year	-	-	-
Net Sequestered Resources	-	-	-
Reprogrammings/Transfers	-	-	-
Supplementals	-	-	-
Total Budget Authority	**-**	**$123,585**	**$78,241**
Collections – Reimbursable Resources	-	-	-
Total Budget Resources	**-**	**$123,585**	**$78,241**
Obligations (Actual/Estimates/Projections)	-	$123,585	$78,241
Personnel: Positions and FTE			
Enacted/Request Positions	-	-	-
Enacted/Request FTE	-	-	-
Onboard and Actual FTE; Includes Collections - Reimbursable Resources			
Onboard (Actual/Estimates/Projections)	-	-	-
FTE (Actual/Estimates/Projections)	-	-	-

Procurement, Construction, and Improvements
Summary of Budget Changes

Budget Formulation Activity *(Dollars in Thousands)*	Positions	FTE	Amount
FY 2018 Enacted	-	-	-
FY 2019 President's Budget	-	-	**$74,896**
FY 2020 Base Budget	-	-	**$24,046**
Transfer to O&S from PC&I for Radiation Portal Monitor Program	-	-	($24,046)
Total Transfers	-	-	**($24,046)**
Total Adjustments-to-Base	-	-	**($24,046)**
Common Viewer	-	-	$7,900
International Rail	-	-	$3,500
Radiation Portal Monitor Replacement Program	-	-	$66,841
Total Investment Elements	-	-	**$78,241**
FY 2020 Request	-	-	**$78,241**
FY 2019 To FY 2020 Change	-	-	**$3,345**

Procurement, Construction, and Improvements
Summary of Transfers

Transfers *(Dollars in Thousands)*	FY 2020 President's Budget		
	Positions	FTE	Amount
Transfer 1 - Transfer to O&S from PC&I for Radiation Portal Monitor Program	**-**	**-**	**($24,046)**
Assets and Infrastructure Acquisition	-	-	($24,046)
Total Transfers	**-**	**-**	**($24,046)**

Transfer 1 – Transfer to O&S from PC&I for Radiation Portal Monitor Program: The Radiation Portal Monitor Program is a post-Full Operating Capability (FOC) program. Base funding authority is being transferred from PC&I to CWMD's Operations and Support (O&S) appropriation to comply with DHS financial policy for funding program sustainment. Major sustainment activities include: Decommission low-use/no-use RPMs and reconfigure sites as required; redeploy previously decommissioned and refurbished RPMs as necessary to address required level of scanning capability at sites; and deploy improvements to fielded systems and conduct test and evaluation of improvements.

Procurement, Construction, and Improvements
Non Pay Budget Exhibits

Non Pay by Object Class

Non-Pay Object Classes *(Dollars in Thousands)*	FY 2018 Enacted	FY 2019 President's Budget	FY 2020 President's Budget	FY 2019 to FY 2020 Change
21.0 Travel and Transportation of Persons	-	-	$187	$187
25.1 Advisory and Assistance Services	-	$3,098	$5,045	$1,947
25.2 Other Services from Non-Federal Sources	-	-	$957	$957
31.0 Equipment	-	$71,798	$72,052	$254
Total - Non Pay Object Classes	**-**	**$74,896**	**$78,241**	**$3,345**

Non Pay Cost Drivers

Leading Non Pay Cost-Drivers *(Dollars in Thousands)*	FY 2018 Enacted	FY 2019 President's Budget	FY 2020 President's Budget	FY 2019 to FY 2020 Total Changes
Radiation Portal Monitor Program (RPMP)	-	$24,046	-	($24,046)
Radiation Portal Monitor Replacement Program (RPM RP)	-	$47,750	$66,841	$19,091
Common Viewer	-	-	$7,900	$7,900
International Rail (IRAIL)	-	$3,100	$3,500	$400
Total – Non Pay Cost Drivers	**-**	**$74,896**	**$78,241**	**($3,345)**

Explanation of Non Pay Cost Drivers

Radiation Portal Monitor Program (RPMP): RPMP is a post-FOC program with the objective to maintain scanning coverage at previously deployed sites. Transferred to the CWMD O&S appropriation in the FY 2020 President's Budget.

Radiation Portal Monitor Replacement Program (RPM RP): RPM RP is a project with the objective to acquire and deploy enhanced RPMs to begin to recapitalize the current fleet of fixed portal monitors. Funding increase from FY 2019 to FY 2020 is due to simultaneous procurement of RPMs procured in FY 2020 with the installation/deployment of the RPMs procured in FY 2019.

International Rail (IRAIL): IRAIL is a project to acquire and deploy a solution to detect and identify nuclear or other radioactive materials out of regulatory control entering the United States via freight rail. Funding increase from FY 2019 to FY 2020 is additional program support required as new IRAIL systems are procured simultaneously with the previously procured systems being installed/deployed.

Common Viewer: Common Viewer will provide a single user interface for CBP personnel to access and control data from various systems (e.g., radiation detection equipment (RDE), non-intrusive inspection (NII) systems, and ancillary control systems) simultaneously. This allows CBP Officers to check real-time radiographic, spectrographic, optical, and x-ray imaging data against traveler, cargo, and conveyance information to support stream of commerce, targeting, and adjudication of threats in a timely manner.

Procurement, Construction, and Improvements
Capital Investments Exhibits

Capital Investments

Investment *(Dollars in Thousands)*	Unique Item Identifier	Acquisition Level	Procurement/ Construction	IT/Non-IT	MAOL	FY 2018 Enacted	FY 2019 President's Budget	FY 2020 President's Budget
Assets and Infrastructure Acquisition	N/A	2	Procurement	Non-IT	Yes	-	$74,896	$78,241

Assets and Infrastructure Acquisition – Investment

Capital Investments Exhibits

Procurement/Acquisition Programs

Investment *(Dollars in Thousands)*	**Unique Item Identifier**	**Acquisition Level**	**Procurement/ Construction**	**IT/Non-IT**	**MAOL**	**FY 2018 Enacted**	**FY 2019 President's Budget**	**FY 2020 President's Budget**
Assets and Infrastructure Acquisition	N/A	2	Procurement	Non-IT	Yes	-	$74,896	$78,241

Assets and Infrastructure Acquisition Investments *(Dollars in Thousands)*	**Unique Item Identifier**	**Acquisition Level**	**Procurement/ Construction**	**IT / Non IT**	**MAOL**	**FY 2018 Enacted[1]**	**FY 2019 President's Budget**	**FY 2020 President's Budget**
Radiation Portal Monitor Program (RPMP)	N/A	1	Procurement	Non-IT	No	$33,773	$24,046	-
Radiation Portal Monitor Replacement Program (RPM RP)	024-000005961	2	Procurement	Non-IT	Yes	$26,751	$47,750	$66,841
Common Viewer	N/A	3	Procurement	IT	No	-	-	$7,900
International Rail (IRAIL)	N/A	3	Procurement	Non-IT	No	$3,000	$3,100	$3,500
On-Dock Rail[2]	N/A	3	Procurement	Non-IT	No	$1,000	-	-
Basic Handheld RIIDs[3]	024-000005960	3	Procurement	Non-IT	Yes	$8,877	-	-
PRD[3]	024-000005959	3	Procurement	Non-IT	Yes	$7,404	-	-
Backpack Systems[2]	N/A	3	Procurement	Non-IT	No	$4,606	-	-
Human Portable Tripwire[2]	024-000005958	3	Procurement	Non-IT	Yes	$3,685	-	-
TOTAL						**$89,096**	**$74,896**	**$78,241**

[1]FY 2018 funding appropriated to DNDO.
[2]No funding requested in FY 2019 or FY 2020.
[3]End item cost per unit is under $250,000; programs transitioned to O&S appropriation in accordance to the Financial Management Policy Manual (FMPM).

PPA Level I Description

The Assets and Infrastructure Acquisition PPA includes resources to acquire and deploy large scale Radiation Detection Equipment (RDE), or other related equipment with an acquisition value over $250,000, to support DHS operational end-users, and address operational and technical detection requirements. This PPA includes the procurement and/or deployment of RDE systems at land border crossings, seaports, international airports (including international preclearance sites), and international mail and express consignment courier facilities, and provides the scientific and technical expertise to design, acquire, and deploy these systems.

CWMD acquisition programs and activities utilize an integrated life cycle management approach to develop, acquire, procure, deploy and sustain nuclear, chemical, radiological, and biological detection systems when acquisition and deployment of an asset is determined to be necessary to support operational customers to mitigate threats. The FY 2020 President's Budget includes $78.2M to support the development and implementation of radiological/nuclear (R/N) detection capabilities. CWMD integrates interagency efforts to develop nuclear detection technologies, evaluate detector performance, and ensure effective response to detection alarms. Due to the dynamic nature of the threat, acquisitions pertaining to R/N terrorism prevention are integrated through a deployment strategy that can readily respond to intelligence cues and requirements of operational partners. CWMD uses PC&I funding to acquire detection equipment for DHS Components. CWMD centrally manages the acquisition, testing, and deployment of those assets. After an initial deployment period, which typically is represented by a manufacturer's warranty period, the operational user is responsible for sustainment of the end item(s) with CWMD maintaining configuration management of the deployed fleet of equipment.

Within the PC&I appropriation, program resources are used to acquire, test, deploy and modernize assets and infrastructure with an expected acquisition value above $250,000 per unit.

The following table provides descriptions for the projects within the CWMD Assets and Infrastructure Acquisition PPA.

Projects	General Description
Radiation Portal Monitor Program (RPMP)	RPMP is a post-Full Operational Capability (FOC) program with the objective to maintain scanning coverage at previously deployed sites. Major activities include: Decommission low-use/no-use RPMs and reconfigure sites as required; deploy new RPMs and redeploy previously decommissioned and refurbished RPMs as necessary to address required level of scanning capability at sites; deploy additional large-scale systems at ports of entry (POEs) or between POEs in the vicinity of the border; deploy improvements to fielded systems; and conduct test and evaluation of improvements.
RPM Replacement Program (RPM RP)	RPM RP is a project with the objective to acquire and deploy enhanced RPMs to begin to recapitalize the current fleet of fixed portal monitors.
Common Viewer	Common Viewer will provide a single user interface for CBP personnel to access, control and monitor in real-time various systems at Ports of Entry such as radiation detection equipment (RDE), non-intrusive inspection (NII) systems, and traffic control systems, thereby providing CBP officers with capabilities to more effectively detect, identify, and/or localize radiological/nuclear or other WMD threats.
International Rail (IRAIL)	IRAIL is a project to acquire and deploy a solution to detect and identify nuclear or other radioactive materials out of regulatory control entering the United States via freight rail. Supports the CBP-led rail Non-Intrusive Inspection (NII) recapitalization Program by leading the radiation detection equipment (RDE) procurement, as well as integration and test and evaluation with rail NII.

The following table provides descriptions of the projects within the legacy FY 2018 Domestic Nuclear Detection Office PC&I appropriation. With the transfer of the functions of DNDO to CWMD, these projects have been transferred to CWMD's O&S appropriation or had no funding requested in FY 2019 or FY 2020.

Projects	General Description
On-Dock Rail (ODR)	The ODR Program is intended to provide increased scanning and detecting efficiencies while screening for R/N material entering the U.S at sea ports of entry via intermodal cargo containers which will be transferred directly from ship to rail via straddle carrier.
Basic Handheld (BHH) RIID	The BHH RIID program is a program aimed at acquiring and deploying devices used for search, detection, localization, and identification of R/N materials, primarily in a secondary screening role.
Personal Radiation Detectors (PRD)	The PRD program is aimed at acquiring and deploying pager-size devices used to detect R/N materials. PRDs are routinely worn by operators for detection and personal protection.
Backpack Systems	The Radiation Detection Backpack program is a program aimed at acquiring and deploying backpack detectors used in situations where a wide-area R/N detection capability is necessary.
Human Portable Tripwire (HPT)	The HPT program is a program aimed at acquiring and deploying small/wearable systems that provide next-generation capabilities to detect, identify, communicate, and adjudicate R/N threats.

Radiation Portal Monitor (RPM) Program

Investment Description

RPMs are used at U.S. land and sea POEs by U.S. Customs and Border Protection (CBP) to scan cargo and conveyances in order to prevent the smuggling of R/N threats or threat materials into the United States, while facilitating the flow of legitimate trade and commerce.

The RPM Program supports CBP's efforts to maintain scanning coverage at POEs, and meet the *Security and Accountability For Every (SAFE) Port Act of 2006 (Public Law 107—347).* As POEs are reconfigured or expanded, RPMs must be relocated, decommissioned, and/or additional RPM systems must be deployed to maintain current scanning capabilities. In addition, improvements will be deployed to systems in the field to extend the service life of RPMs, as well as augment detection efficacy, operational performance, and operational efficiency.

In FY 2020, CWMD plans to continue managing the deployment of the remaining polyvinyl toluene (PVT)-based systems in its inventory and to deploy selected improvements that have been projected to enhance operational or threat detection performance for fielded systems.

Justification

The FY 2020 President's Budget transfers funding for this activity to CWMD's O&S appropriation.

FY 2018 Key Milestone Events

- Reconfigured RPMs at 18 POEs.
- Deployed remote operations equipment at 12 POEs.
- Deployed software updates (e.g., Enhanced Radiological Nuclear Inspection and Evaluation (ERNIE) to 1 POE).

FY 2019 Planned Key Milestone Events

- Reconfigure RPMs at 15 POEs.
- Deploy remote operations equipment at 8 POEs.

FY 2020 Planned Key Milestone Events

- N/A.

Overall Investment Funding

(Dollars in Thousands)	Prior Years	FY 2018	FY 2019	FY 2020
Operations and Support		-	-	-
Procurement, Construction, and Improvements		$32,005	$24,046	-
Research and Development		-	-	-
Legacy Appropriations	$974,385			
Project Funding	$974,385	$32,005	$24,046	-
Obligations	$974,385	$24,786		
Expenditures	$960,929	$4,880		

Contract Information (Current/Execution Year, Budget Year)

Contract Number	Contractor	Type	Award Date (mo/yr)	Start Date (mo/yr)	End Date (mo/yr)	EVM in Contract	Total Value *(Dollars in Thousands)*
HSHQDC-15-X-00060	Pacific Northwest National Lab	IAA	03/2015	03/2015	0320/20	No	$119,964
HSHQDC-17-IPA006	CBP Border Security Deployment Program (BSDP)	IAA	05/2017	05/2017	05/2022	No	$20,000
HSHQDC-17-IPA008	CBP Data Analysis Center – Threat Evaluation Reduction (DAC-TER)	RWA	06/2017	06/2017	06/2022	No	$8,400
HSHQDC-17-PA001	General Service Administration	RWA	01/2017	01/2017	09/2018	No	$6,551
HSHQDC-16-PA001	General Service Administration	RWA	05/2016	06/2016	09/2018	No	$1,896

Significant Changes to Investment since Prior Year Enacted

RPM Program transferred from PC&I to CWMD's O&S appropriation.

Investment Schedule

Description	Design Work		Project Work		Estimated Cost *(Dollars in Thousands)*
	Initiated	Completed	Initiated	Completed	
	FY 2018				
Deployment/redeployment			FY 2018 Q1	FY 2019 Q2	$9,712
Continuing System Improvements incl Remote Ops			FY 2018 Q1	FY 2019 Q3	$14,232
Science and Engineering			FY 2018 Q1	FY 2018 Q4	$3,058
Logistics			FY 2018 Q1	FY 2018 Q4	$1,705
Indirect Support			FY 2018 Q1	FY 2018 Q4	$3,298
	FY 2019				
Deployment/redeployment			FY 2019 Q2	FY 2020 Q2	$7,365
Continuing System Improvements incl Remote Ops			FY 2019 Q2	FY 2020 Q3	$9,825
Science and Engineering			FY 2019 Q2	FY 2019 Q4	$2,060
Logistics			FY 2019 Q2	FY 2019 Q4	$2,166
Indirect Support			FY 2019 Q2	FY 2019 Q4	$2,630
	FY 2020				
N/A					

Radiation Portal Monitor Replacement Program (RPM RP)

Investment Description

RPMs are used at U.S. land and sea POEs by CBP to scan cargo and conveyances in order to prevent the smuggling of R/N threats or threat materials into the United States, while facilitating the flow of legitimate trade and commerce.

The RPM RP will support needed enhancements to CBP R/N materials detection and identification capabilities at high-volume POEs by addressing the five key drivers of enhancing mission effectiveness: (1) monitoring the state of health; (2) modernizing; (3) addressing emerging needs; (4) increasing reliability and availability; and (5) maintainability. These drivers were developed jointly by CBP and Pacific Northwest National Laboratory to guide DHS RPM recapitalization and modernization efforts.

The focus of the current RPM RP is the selective deployment of new RPMs to enhance mission effectiveness, gain operational efficiencies, and to address emerging mission needs. In September 2018, CWMD awarded contracts to three vendors for RPM integration and test articles. Currently, the program plans are to acquire and deploy approximately 200 RPMs between fiscal years 2018-2022. CWMD procured nine systems in FY 2018, and plans to procure 80 systems in FY 2019 and 111 systems in FY 2020.

Justification

RPM RP is aligned to several overarching technical requirements for improving R/N detection, including the following areas:
1) Deploy detection systems for scanning of cargo and conveyances for R/N materials at U.S. POEs.
2) Ensure steady state operations of deployed radiation detection systems do not unduly disrupt commercial cargo and passenger flow.

The FY 2020 request provides funding required to increase the inventory of RPMs to meet current and expected near-term demand. This funding will also allow the replacement of older units that cannot accommodate new revised operational settings that help mitigate nuisance alarms, which is precluding the implementation of remote operations capability.

FY 2018 Key Milestone Events

- Completed environmental testing to assess system performance in different environmental conditions.
- Completed a comparative assessment of candidate systems against a defined threat matrix.
- Conducted second down-select of vendor's systems proposed to meet the requirements of the acquisition.
- Obtained acquisition approval to initiate Low Rate Initial Production (LRIP).
- Awarded up to three Indefinite Delivery Indefinite Quantity (IDIQ) contracts for RPM integration and test articles.
- Procured nine systems for testing.

FY 2019 Planned Key Milestone Events

- Commence stream of commerce and integration testing to assess performance in operational conditions and integration with CBP systems.
- Complete a cyber security assessment of the RPM systems integrated into the CBP network.
- Provide an assessment of the variations in optimized solution performance against a defined threat matrix of the selected systems.
- Evaluate the operational effectiveness, suitability, and cybersecurity of the selected RPMs in their intended operational environment.
- Obtain CBP authority to operate (ATO) for selected systems.
- Obtain acquisition approval to conduct IDIQ delivery order for 80 systems.
- Award delivery orders with selected vendors to procure 80 systems.

FY 2020 Planned Key Milestone Events

- Deliver, deploy, and install RPMs procured in FY 2019 to CBP POEs.
- Declare Initial Operating Capability (IOC) of selected RPMs at multiple POEs.
- Award delivery orders with selected vendors to procure 111 systems.

Overall Investment Funding

(Dollars in Thousands)	Prior Years	FY 2018	FY 2019	FY 2020
Operations and Support		-	-	-
Procurement, Construction, and Improvements		$26,751	$47,750	$66,841
Research and Development		-	-	-
Legacy Appropriations	$6,460			
Project Funding	$6,460	$26,751	$47,750	$66,841
Obligations	$4,277	$19,581		
Expenditures	$4,220	$3,562		

Contract Information (Current/Execution Year, Budget Year)

Contract Number	Contractor	Type	Award Date (mo/yr)	Start Date (mo/yr)	End Date (mo/yr)	EVM in Contract	Total Value *(Dollars in Thousands)*
70RDND18D00000001	L-3 Communications	IDIQ	09/2018	09/2018	09/2023	No	$291,400*
70RDND18D00000002	Leidos	IDIQ	09/2018	09/2018	09/2023	No	$291,400*
70RDND18D00000003	Smiths Detection	IDIQ	09/2018	09/2018	09/2023	No	$291,400*
70 RDND18K00000011	Pacific Northwest National Lab	IAA	07/2018	07/2018	07/2021	No	$34,361
HSHQDC-15-X-00060	Pacific Northwest National Lab	IAA	08/2016	08/2016	08/2019	No	$3,043

* The program contract ceiling is $291.4M (the total is shared between all three contractors)

Significant Changes to Investment since Prior Year Enacted

None.

Investment Schedule

Description	Design Work		Project Work		Estimated Cost *(Dollars in Thousands)*
	Initiated	Completed	Initiated	Completed	
	FY 2018				
System Development, Integration, and Test			FY 2018 Q1	FY 2019 Q4	$18,741
System Procurement (9 systems)			FY 2018 Q4	FY 2019 Q1	$5,144
Program Support			FY 2018 Q1	FY 2018 Q4	$2,866
	FY 2019				
System Development, Integration, and Test			FY 2019 Q2	FY 2020 Q4	$1,160
System Procurement (80 systems)			FY 2019 Q4	FY 2020 Q4	$38,262
System Deployment and Construction			FY 2019 Q3	FY 2020 Q4	$4,785
Program Support			FY 2019 Q1	FY 2019 Q4	$3,543
	FY 2020				
System Procurement (111 Systems)			FY 2020 Q4	FY 2021 Q4	$47,500
System Deployment and Construction			FY 2020 Q1	FY 2023 Q4	$16,724
Program Support			FY 2020 Q1	FY 2020 Q4	$2,617

International Rail (IRAIL)

Investment Description

The International Rail program will acquire and deploy fixed R/N detection equipment (such as an RPM) to detect and identify nuclear or other radioactive materials out of regulatory control entering the United States via freight rail cargo through the active rail POEs. The CWMD IRAIL Program will acquire and deploy a solution in coordination with the CBP Non-Intrusive Inspection (NII) Program, which is recapitalizing aging NII systems rail POEs.

Justification

DHS has identified the requirement to improve the capability to scan cargo at international rail crossings as a priority. CWMD no longer intends to procure integrated RDE/NII units, but will procure RDE separately from NII, ensuring it can be integrated with the new rail NII systems once integration and testing is complete.

FY 2018 Key Milestone Events

- N/A.

FY 2019 Planned Key Milestone Events

- Procure "rail variant" RPM systems for testing and deployment.

FY 2020 Planned Key Milestone Events

- Integration of RPM systems with CBP NII system(s).
- Testing of integrated RPM systems.
- Procure "rail variant" RPM systems for deployment.

Overall Investment Funding

(Dollars in Thousands)	Prior Years	FY 2018	FY 2019	FY 2020
Operations and Support		-	-	-
Procurement, Construction, and Improvements		$3,000	$3,100	$3,500
Research and Development		$2,750	$3,000	-
Legacy Appropriations				
Project Funding	-	$5,750	$6,100	$3,500
Obligations	-	$3,740		
Expenditures	-	$251		

Contract Information (Current/Execution Year, Budget Year)

Contract Number	Contractor	Type	Award Date (mo/yr)	Start Date (mo/yr)	End Date (mo/yr)	EVM in Contract	Total Value *(Dollars in Thousands)*
HSHQDN-16-X-00047	Pacific Northwest National Lab	Existing IAA	08/2016	08/2016	08/2021	No	$9,000

Significant Changes to Investment since Prior Year Enacted

None.

Investment Schedule

Description	Design Work		Project Work		Estimated Cost *(Dollars in Thousands)*
	Initiated	Completed	Initiated	Completed	
	FY 2018				
System Procurement for test			FY 2019 Q3	FY 2020 Q2	$3,000
	FY 2019				
System Procurement and deployment			FY 2019 Q4	FY 2020 Q4	$3,100
	FY 2020				
System Procurement and deployment			FY 2020 Q4	FY 2021 Q4	$3,500

Common Viewer Program

Investment Description

Common Viewer will provide a single user interface for CBP personnel to access and control various systems encountered at Ports of Entry such as radiation detection equipment (RDE), non-intrusive inspection (NII) systems, and traffic control systems. Additionally, Common Viewer will simultaneously allow both CBP officers in the field and staff at National Targeting Centers and CBP remote operations & analysis centers to monitor real-time radiographic, spectrographic, optical, and x-ray imaging data against traveler, cargo, and conveyance information for comparison against law enforcement, intelligence, and other enforcement data. Common Viewer will therefore provide CBP officers with capabilities to be more effective to detect, identify, and/or localize radiological/nuclear threats (including material and other components) that may be smuggled via both containerized and non-containerized cargo at points of entry into the United States of America.

Justification

This important capability will allow CBP officers in the field and staff at the National Targeting Center and CBP remote operations / analysis centers to check real-time radiographic, spectrographic, optical, and x-ray imaging data against traveler, cargo, and conveyance information to support stream of commerce, targeting, and adjudication of threats in a timely manner, significantly improving threat detection and improving law enforcement efficiency.

In FY 2020, CWMD will procure and deploy 11 systems to land border crossings and sea ports of entry (POEs). There is a current lack of sensor integration for radiological/nuclear detection across U.S. POE facilities that could otherwise provide a common operating picture of emerging threats.

FY 2018 Key Milestone Events

- N/A.

FY 2019 Planned Key Milestone Events

- N/A.

FY 2020 Planned Key Milestone Events

- Deploy 11 systems to land border crossings and sea POEs.

Overall Investment Funding

(Dollars in Thousands)	Prior Years	FY 2018	FY 2019	FY 2020
Operations and Support	-	-	-	-
Procurement, Construction, and Improvements	-	-	-	$7,900
Research and Development	-	$2,680	-	-
Project Funding	-	$2,680	-	$7,900
Obligations	-	-	-	-
Expenditures	-	-	-	-

Contract Information (Current/Execution Year, Budget Year)

Contract Number	Contractor	Type	Award Date (mo/yr)	Start Date (mo/yr)	End Date (mo/yr)	EVM in Contract	Total Value *(Dollars in Thousands)*
CWMD 2019-350 (CWMD1829-002)	Rapiscan – Prototype (Funded w/ R&D)	FFP	11/2018	11/2018	02/2020	No	$483
CWMD 2019-350 (CWMD1829-003)	Symetrica -- Prototype (Funded w/ R&D)	FFP	02/2019	02/2019	09/2019	No	$1,287

Significant Changes to Investment since Prior Year Enacted

N/A.

Investment Schedule

Description	Design Work		Project Work		Estimated Cost *(Dollars in Thousands)*
	Initiated	Completed	Initiated	Completed	
FY 2018					
N/A					
FY 2019					
N/A					
FY 2020					
System Procurement to support up to 11 ports of entry			FY 2020 Q1	FY 2020 Q3	$4,438
Deployment of systems at POEs and operator training			FY 2020 Q2	FY 2021 Q1	$3,462

On-Dock Rail (ODR) Program

Investment Description

The ODR Program is intended to provide increased scanning and detecting performance and efficiencies while screening for R/N material entering the U.S at sea ports of entry via intermodal cargo containers which will be transferred directly from ship to rail via straddle carrier.

Justification

ODR is aligned to several overarching technical requirements for improving R/N detection, including the following areas: (1) Deploy detection systems for scanning of cargo and conveyances at U.S. ports of entry for R/N materials; and (2) Ensure steady state operations of deployed radiation detection systems do not unduly disrupt commercial cargo flow.

No funds are being requested for ODR in FY 2020.

FY 2018 Key Milestone Events

- Completed deployment of two Straddle Carrier Portals (SCP) at Port of Tacoma.
- Conducted Operational Assessment at Port of Tacoma.

FY 2019 Planned Key Milestone Events

- Begin the Post-Implementation Review for SCPs at Port of Tacoma.
- Complete SCP fabrication, site design, and deployment at Maher Terminal (Port of New York/New Jersey).

FY 2020 Planned Key Milestone Events

- Begin the Post-Implementation Review for SCP at Port of New York/New Jersey.

Overall Investment Funding

(Dollars in Thousands)	Prior Years	FY 2018	FY 2019	FY 2020
Operations and Support		-	-	-
Procurement, Construction, and Improvements		$1,000	-	-
Research and Development		-	-	-
Legacy Appropriations	$40,150			
Project Funding	$40,150	$1,000	-	-
Obligations	$40,150	$429		
Expenditures[1]	$29,918	$111		

[1]Reliable expenditure data prior to FY17 is not currently available owing to the deployment of a new financial management solution.

Contract Information (Current/Execution Year, Budget Year)

Contract Number	Contractor	Type	Award Date (mo/yr)	Start Date (mo/yr)	End Date (mo/yr)	EVM in Contract	Total Value *(Dollars in Thousands)*
HSHQDC-15-X-00060	Pacific Northwest National Lab	IAA	03/2015	03/2015	03/2020	No	$1,940
70RDND19C00000003	DropBox, Inc	FFP	02/2019	02/2019	02/2021	No	$2,154
HSHQDN-16-X-00035	Savannah River National Lab	IAA	03/2016	03/2016	03/2021	No	$9,000
HSHQDN-16-X-00047	Pacific Northwest National Lab	IAA	08/2016	08/2016	08/2021	No	$9,000
70RDND18C00000001	Johns Hopkins University / Applied Physics Lab	T&M	01/2018	01/2018	01/2021	No	$300

Significant Changes to Investment since Prior Year Enacted

None.

Investment Schedule

Description	Design Work		Project Work		Estimated Cost *(Dollars in Thousands)*
	Initiated	Completed	Initiated	Completed	
	FY 2018				
SCP fabrication and deployment at Maher Terminal			FY2019 Q2	FY2019 Q4	$1,000
	FY 2019				
N/A					
	FY 2020				
N/A					

Basic Handheld (BHH) Radioisotope Identification Device (RIID)

Investment Description

Basic Handheld RIIDs are used for search, detection, localization, and identification of radionuclide composition of R/N materials, and for quick and accurate measurement of dose rate and count rate. These devices are also used to support secondary screening and small-area searches.

Justification

Many legacy handhelds used by CBP, USCG, and TSA have reached or exceeded their expected service life and need immediate replacement. In FY 2016, the recapitalization of fielded BHH RIIDs using a strategic sourcing contract with an economic order quantity construct began. This contract provided Department-wide cost savings by replacing older, less capable equipment with modernized replacement BHH RIIDs with greater capability and lower sustainment costs. By meeting FOC requirements for DHS Components, DHS will be able to close and adequately mitigate capability gaps, minimizing the risk of illicit R/N material entering the United States.

No funds for RIID are being requested in the PC&I appropriation in FY 2020. Funds are included in the CWMD O&S appropriation for the FY 2019 President's Budget and the FY 2020 President's Budget.

FY 2018 Key Milestone Events

- Delivered 926 devices to CBP.
- Procured 442 devices for USCG.
- Completed Regression Test for detector improvements.
- Completed engineering change for DoD-compliant satellite phone connectivity to detectors.

FY 2019 Planned Key Milestone Events

- Deliver 442 devices for USCG.

FY 2020 Planned Key Milestone Events

- N/A.

Overall Investment Funding

(Dollars in Thousands)	Prior Years	FY 2018	FY 2019	FY 2020
Operations and Support		-	-	-
Procurement, Construction, and Improvements		$8,877	-	-
Research and Development		-	-	-
Legacy Appropriations	$7,708			
Project Funding	$7,708	$8,877	-	-
Obligations[1]	$7,708	$5,970		
Expenditures[2]	$7,708	$5,586		

[1]Prior to FY 2017, all Human Portable Radiation Detection Systems (HPRDS) devices were tracked as a consolidated portfolio and not as separate projects. The Prior Years Project Funding and Obligations reflect only FY17 amounts.
[2]Reliable expenditure data prior to FY17 is not currently available owing to the deployment of a new financial management solution. The Prior Years Expenditures reflect only FY17 amounts.

Contract Information (Current/Execution Year, Budget Year)

Contract Number	Contractor	Type	Award Date (mo/yr)	Start Date (mo/yr)	End Date (mo/yr)	EVM in Contract	Total Value *(Dollars in Thousands)*
HSHQDC-15-D-00018	Smiths Detection	IDIQ	09/2015	09/2015	09/2020	No	$143,000
HSHQDN-16-C-00023	Smiths Detection	FFP	09/2016	09/2016	09/2018	No	$1,289
70RDND18K00000006	Pacific Northwest National Laboratory	IAA	05/2018	06/2018	12/2018	No	$1,000
70RDND18K00000008	Argonne National Laboratory	IAA	05/2018	06/2018	12/2018	No	$1,000

Significant Changes to Investment since Prior Year Enacted

None.

Investment Schedule

Description	Design Work		Project Work		Estimated Cost *(Dollars in Thousands)*
	Initiated	Completed	Initiated	Completed	
	FY 2018				
BHH Procurement for CBP and USCG			FY 2018 Q2	FY 2019Q1	$8,877
	FY 2019				
N/A					
	FY 2020				
N/A					

Personal Radiation Detector (PRD)

Investment Description

PRDs are pager-size devices used to detect R/N materials. The PRDs are typically clipped to a uniform or a belt. PRDs detect both gamma (general purpose) and gamma/neutron (maritime environment) R/N sources. They automatically monitor the environment and alert the user if R/N material is detected.

Justification

PRDs are continuously worn by operators for R/N detection and personal protection, and are used for deliberate, passive screening and continuous monitoring of the environment to increase the opportunity and likelihood of detecting illicit R/N material. Legacy devices used by CBP, USCG, and TSA have reached or exceeded their expected service life and are in need of immediate replacement. CWMD will recapitalize CBP and USCG legacy systems to maintain current capability and replace older, less capable equipment with an economic order quantity construct that provides for significant cost savings.
No funds for PRD are being requested in the PC&I appropriation in FY 2020. Funds are included in the CWMD O&S appropriation for the FY 2019 President's Budget and the FY 2020 President's Budget.

FY 2018 Key Milestone Events

- Deployed limited quantities of PRDs to CBP end users to assess operational suitability during limited user evaluation.
- Procured 321 PRDs for USCG.

FY 2019 Planned Key Milestone Events

- Begin CBP's PRD recapitalization effort, and also solicit a "maritime variant" in order to recapitalize USCG's currently fielded, aging PRD fleet to sustain USCG operational readiness.

FY 2020 Planned Key Milestone Events

- N/A, funding requested in CWMD's O&S appropriation.

Overall Investment Funding

(Dollars in Thousands)	Prior Years*	FY 2018	FY 2019	FY 2020
Operations and Support		-	-	-
Procurement, Construction, and Improvements		$7,404	-	-
Research and Development		-	-	-
Legacy Appropriations	$11,000			
Project Funding	$11,000	$7,404	-	-
Obligations[1]	$5,171	$434		
Expenditures[2]	$5,171			

[1]Prior to FY 2017, all Human Portable Radiation Detection Systems (HPRDS) devices were tracked as a consolidated portfolio and not as separate projects. The Prior Years Project Funding and Obligations reflect only FY17 amounts.
[2]Reliable expenditure data prior to FY17 is not currently available owing to the deployment of a new financial management solution. The Prior Years Expenditures reflect only FY17 amounts.
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Contract Information (Current/Execution Year, Budget Year)

Contract Number	Contractor	Type	Award Date (mo/yr)	Start Date (mo/yr)	End Date (mo/yr)	EVM in Contract	Total Value *(Dollars in Thousands)*
HSHQDN-17-D-00001	Polimaster, Inc.	IDIQ	09/2017	09/2017	09/2022	No	$90,000
HSHQDN-17-D-00002	Thermo-Fisher	IDIQ	09/2017	09/2017	09/2022	No	$90,000

Significant Changes to Investment since Prior Year Enacted

None.

Investment Schedule

Description	Design Work		Project Work		Estimated Cost *(Dollars in Thousands)*
	Initiated	Completed	Initiated	Completed	
	FY 2018				
PRD Procurement for CBP			FY 2019 Q1	FY 2020 Q2	$7,164
Training for CBP			FY 2019 Q1	FY 2019 Q2	$240
	FY 2019				
N/A					
	FY 2020				
N/A					

Backpack Program

Investment Description

Backpack radiation detection systems are used when a wide-area detection capability is necessary, potentially in covert operations, and are used to quickly detect and locate a radiation threat in public or maritime environments such as aircraft, medium- to large-sized vessels, open-air events, parking lots, and stadiums. Backpack systems provide the capability to detect both gamma and neutron radiation. A backpack system is also being used for Small Vessel Standoff Detection (SVSD) requirements for boat-to-boat scanning capability. Current backpack systems use Helium-3 (^{3}He) for neutron radiation detection. The Helium-3 Alternative Implementation Backpack Program (HAIBP) is developing customized-commercial solutions that in addition to detecting radiation will also perform identification and communication functions that will lead to procurement of backpacks for DHS operational components. HAIBP combines wide-area search, detection, and identification functions into a single data-streaming enabled device using Helium-3 alternative technology to shorten the amount of time required for alarm adjudication. It will also enable the reduction of the number of types and total quantities of systems required in the field, thereby reducing operational user burden as well as sustainment costs.

Justification

No funds for HAIBP are being requested in FY 2020.

FY 2018 Key Milestone Events

- Awarded four contracts to acquire modified commercial technology to deliver HAIBP requirements.

FY 2019 Planned Key Milestone Events

- Conduct Key Performance Testing of HAIBP First Article backpacks.
- Conduct Low Rate Initial Production Testing.

FY 2020 Planned Key Milestone Events

- N/A.

Overall Investment Funding

(Dollars in Thousands)	Prior Years[1]	FY 2018	FY 2019	FY 2020
Operations and Support		-	-	-
Procurement, Construction, and Improvements		$6,000	-	-
Research and Development		$1,755	-	-
Legacy Appropriations	-			
Project Funding	-	$7,755	-	-
Obligations[1]	-	$19		
Expenditures[2]	-	-		

[1]Prior to FY 2017, all Human Portable Radiation Detection Systems (HPRDS) devices were tracked as a consolidated portfolio and not as separate projects. The Prior Years Project Funding and Obligations reflect only FY17 amounts.
[2]Reliable expenditure data prior to FY17 is not currently available owing to the deployment of a new financial management solution. The Prior Years Expenditures reflect only FY17 amounts.
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Contract Information (Current/Execution Year, Budget Year)

Contract Number	Contactor	Type	Award Date (mo/yr)	Start Date (mo/yr)	End Date (mo/yr)	EVM in Contract	Total Value *(Dollars in Thousands)*
70DND18C00000009	Bubble Technologies Industries	FPPPRTM	08/2018	08/2018	12/2021	No	$2,096
70DND18C00000010	MIRION Technologies	FPPPRTM	08/2018	08/2018	12/2021	No	$1,606
70DND18C00000011	SYMETRICA Inc.	FPPPRTM	08/2018	08/2018	12/2021	No	$2,818
70DND18C00000012	Target Systemelektronik	FPPPRTM	08/2018	08/2018	12/2021	No	$1,788
70RND19K00000002	Argonne National Laboratory	IAA	02/2019	02/2019	02/2020	No	$750
70RDND19K0000001	Idaho National Laboratory	IAA	12/2018	12/2018	12/2019	No	$240

Significant Changes to Investment since Prior Year Enacted

$1.4M PC&I funding added in FY 2018 for a total of $6M for the procurement of these systems.

Investment Schedule

Description	Design Work		Project Work		Estimated Cost *(Dollars in Thousands)*
	Initiated	Completed	Initiated	Completed	
	FY 2018				
Procure HAIBP systems for operational users			FY 2020 Q1	FY 2021 Q4	$6,000
	FY 2019				
N/A					
	FY 2020				
N/A					

Human Portable Tripwire (HPT)

Investment Description

HPT devices are small/wearable systems that provide next-generation capabilities to detect, identify, communicate, and adjudicate R/N threats. HPTs also function as personal protective equipment to warn operators of potential exposure to harmful levels of radiation. HPTs are able to identify and locate the source of radiation and allow personnel to take appropriate action. The technology includes communication features that allow the user to easily seek additional technical assistance from experts if needed.

Justification

No funds for HPT are being requested in FY 2020.

FY 2018 Key Milestone Events

- Continued deliveries of HPT devices.
- Conducted Post-Implementation Review for USBP.

FY 2019 Planned Key Milestone Events

- N/A.

FY 2020 Planned Key Milestone Events

- N/A.

Overall Investment Funding

(Dollars in Thousands)	Prior Years[1]	FY 2018	FY 2019	FY 2020
Operations and Support		-	-	-
Procurement, Construction, and Improvements		$3,685	-	-
Research and Development		-	-	-
Legacy Appropriations	$20,419			
Project Funding	$20,419	$3,685	-	-
Obligations[1]	$20,419	$300		
Expenditures[2]	$10,294	$150		

[1]Prior to FY 2017, all Human Portable Radiation Detection Systems (HPRDS) devices were tracked as a consolidated portfolio and not as separate projects. The Prior Years Project Funding and Obligations reflect only FY17 amounts.
[2]Reliable expenditure data prior to FY17 is not currently available owing to the deployment of a new financial management solution. The Prior Years Expenditures reflect only FY17 amounts.

Contract Information (Current/Execution Year, Budget Year)

Contract Number	Contractor	Type	Award Date (mo/yr)	Start Date (mo/yr)	End Date (mo/yr)	EVM in Contract	Total Value *(Dollars in Thousands)*
HSHQDC-15-D-00019	FLIR Detection	IDIQ	09/2015	09/2015	09/2020	No	$40,000

Significant Changes to Investment since Prior Year Enacted

None.

Investment Schedule

Description	Design Work		Project Work		Estimated Cost *(Dollars in Thousands)*
	Initiated	Completed	Initiated	Completed	
	FY 2018				
Continued delivery of HPT devices			FY 2018 Q3	FY 2019 Q3	$0
	FY 2019				
N/A					
	FY 2020				
N/A					

Department of Homeland Security

Countering Weapons of Mass Destruction

Research and Development

Fiscal Year 2020
Congressional Justification

Table of Contents

Research and Development

Budget Comparison and Adjustments

Comparison of Budget Authority and Request

Organization (Dollars in Thousands)	FY 2018 Enacted			FY 2019 President's Budget			FY 2020 President's Budget			FY 2019 to FY 2020 Total Changes		
	Pos.	FTE	Amount	Pos.	FTE	Amount	Pos.	FTE	Amount	Pos.	FTE	Amount
CWMD Research and Development	-	-	-	-	-	$80,443	-	-	$67,681	-	-	($12,762)
Total	**-**	**-**	**-**	**-**	**-**	**$80,443**	**-**	**-**	**$67,681**	**-**	**-**	**($12,762)**
Subtotal Discretionary - Appropriation	-	-	-	-	-	$80,443	-	-	$67,681	-	-	($12,762)

*The Countering Weapons of Mass Destruction Office (CWMD) was created in December of 2017 to elevate and focus the CWMD missions within DHS and to provide a focal point for the interagency. Funds appropriated FY18 and prior were appropriated to the Domestic Nuclear Detection Office (DNDO). Carryover funding reflects DNDO R&D funding.

The CWMD Research and Development (R&D) appropriation provides resources necessary to identify, explore, and demonstrate new technologies and capabilities that will help enable the DHS and its partners to prevent, protect against, respond to, and mitigate nuclear, chemical, radiological, and biological threats and incidents.

The appropriation includes the following Program, Project, and Activity (PPA):

CWMD Research and Development: CWMD works closely with its operational customers to determine user gaps, develop technology to fill those gaps, and then transition those technologies to operational use. For the radiological and nuclear threats, the CWMD R&D supports Technology Readiness Levels (TRL) 1-7. For the chemical and biological threat, CWMD supports TRL's 6-7, with the Science and Technology Directorate (S&T) supporting TRL's 1-5.

Research and Development
Budget Authority and Obligations

Budget Authority *(Dollars in Thousands)*	**FY 2018**	**FY 2019**	**FY 2020**
Enacted/Request	**-**	**$80,443**	**$67,681**
Carryover and/or Recoveries (Actual/Estimates/Projections)	-	$64,961	-
Rescissions to Current Year/Budget Year	-	-	-
Net Sequestered Resources	-	-	-
Reprogrammings/Transfers	-	-	-
Supplementals	-	-	-
Total Budget Authority	**-**	**$145,404**	**$67,681**
Collections – Reimbursable Resources	-	-	-
Total Budget Resources	**-**	**$145,404**	**$67,681**
Obligations (Actual/Estimates/Projections)	-	$145,404	$67,681
Personnel: Positions and FTE			
Enacted/Request Positions	-	-	-
Enacted/Request FTE	-	-	-
Onboard and Actual FTE; Includes Collections - Reimbursable Resources			
Onboard (Actual/Estimates/Projections)	-	-	-
FTE (Actual/Estimates/Projections)	-	-	-

Research and Development
Summary of Budget Changes

Budget Formulation Activity *(Dollars in Thousands)*	Positions	FTE	Amount
FY 2018 Enacted	-	-	-
FY 2019 President's Budget	-	-	**$80,443**
FY 2020 Base Budget	-	-	**$80,443**
Transfer to CWMD/R&D from CWMD/O&S for Technical Forensics	-	-	$2,600
Total Transfers	-	-	**$2,600**
Total Adjustments-to-Base	-	-	**$2,600**
FY 2020 Current Services	-	-	**$83,043**
Device Development	-	-	$2,059
Total, Program Increases	-	-	**$2,059**
Research and Development	-	-	($17,421)
Total, Program Decreases	-	-	**($17,421)**
FY 2020 Request	-	-	**$67,681**
FY 2019 To FY 2020 Change	-	-	**($12,762)**

Research and Development
Justification of Transfers

Transfers *(Dollars in Thousands)*	FY 2020 President's Budget		
	Positions	FTE	Amount
Transfer 1 - Transfer to CWMD/R&D from CWMD/O&S for Technical Forensics	-	-	**$2,600**
CWMD Research and Development	-	-	$2,600
Total Transfers	-	-	**$2,600**

Transfer 1 – Transfer to CWMD/R&D from CWMD/O&S for Technical Forensics: Base funding for National Nuclear Forensics Expertise Development Program is being transferred from the Operations and Support (O&S) appropriation to the CWMD R&D appropriation. This program maintains the technical expertise required to execute the Nation's nuclear forensics mission through interdisciplinary R&D collaboration among students, academic departments, universities, and national laboratories.

Research and Development
Justification of Program Changes

Program Changes *(Dollars in Thousands)*	FY 2020 President's Budget		
	Positions	FTE	Amount
Program Change 1 - Device Development	-	-	**$2,059**
CWMD Research and Development	-	-	$2,059
Program Change 2 - Research and Development	-	-	**($17,421)**
CWMD Research and Development	-	-	($17,421)
Total Program Changes	-	-	**($15,362)**

Program Change 1 – Detection Capability Development:

Description
The FY 2020 President's Budget includes a net increase of $2.1M for project changes within the Detection Capability Development program, which supports capability development projects that are characterized as late-stage TRL (6-7) and are anticipated to lead to a materiel solution. The base for this program is presented under separate cover as For Official Use Only (FOUO) information.

Justification
The FY 2020 President's Budget includes an increase of $3.5M for development efforts associated with BioDetection21 (BD21) and a reduction of $1.4M in Advanced Technology Demonstrations (ATD). New biological detection platforms/capabilities are required, which will support earlier detection and confirmation of an outdoor biological attack. BD21 funding will be used to build upon the BD21 Prototype body of knowledge to integrate a knowledge of live, non-infectious agents into an Analysis of Alternatives (AoA) and begin evaluating systems integration activities. The end result will be a system that provides high confidence information to facilitate impactful decisions and more timely response after a bioterrorist attack, thereby enabling casualty mitigation. The reduction in ATD is due to the completion of several projects that no longer require FY 2020 R&D funding.

Performance
BD21 will enhance CWMD and operational user performance. Current biodetection capability does not provide the required timeliness for effective emergency management, medical, and public health response to mitigate the effects of a biological incident. Neither can it be deployed to effectively cover the additional cities required beyond what is covered by the current biodetection program. BD21 will achieve national security objectives in a more cost-effective manner due to greater technological performance and a more efficient and effective operational concept.

Program Change 2 –Research and Development:

Description
The FY 2020 President's Budget includes a reduction of $17.4M to R&D. The base for this program is presented under separate cover as FOUO information.

Justification
The FY 2018 transition from DNDO to CWMD resulted in changes in the Department's R&D strategy with respect to radiological and nuclear (R/N) detection and technical forensics. In its Research and Development program, CWMD will de-emphasize basic research and will instead refocus on applied research to ensure that a technology pipeline is maintained in support of high priority CWMD needs. Successful technologies developed under this program will continue to be further developed through CWMD Detection Capability Development or Rapid Capabilities programs.

Reductions are being taken in basic research which is not in support of high priority CWMD needs, such as the development of lower TRL enabling technologies, including new semi-conductor or scintillator radiation detection materials and laser-based sources. Reductions are also being made in applied research that don't support high priority CWMD needs, such as the development of models for probability of encounter and operational modeling. Examples of new programs which support high priority CWMD needs are Anomaly Detection and Detector/User Interface research under the Small Business Innovation Research (SBIR) program.

Performance
The program decrease will reduce basic research efforts and and will result in reduced support for educational development of the next generation of scientists and engineers in CWMD related disciplines. To mitigate the impact, CWMD will work with other agencies (e.g., DOE Office of Science) to leverage relevant emerging basic research to maintain a healthy R&D pipeline.

Research and Development
Non Pay Budget Exhibits

Non Pay Summary

Organization *(Dollars in Thousands)*	FY 2018 Enacted	FY 2019 President's Budget	FY 2020 President's Budget	FY 2019 to FY 2020 Total Changes
CWMD Research and Development	-	$80,443	$67,681	($12,762)
Total	**-**	**$80,443**	**$67,681**	**($12,762)**
Discretionary - Appropriation	-	$80,443	$67,681	($12,762)

Non Pay by Object Class

Non-Pay Object Classes *(Dollars in Thousands)*	FY 2018 Enacted	FY 2019 President's Budget	FY 2020 President's Budget	FY 2019 to FY 2020 Change
21.0 Travel and Transportation of Persons	-	$173	$133	($40)
25.1 Advisory and Assistance Services	-	$12,119	$10,079	($2,040)
25.3 Other Goods and Services from Federal Sources	-	$14,536	$12,966	($1,570)
25.5 Research and Development Contracts	-	$44,642	$35,701	($8,941)
41.0 Grants, Subsidies, and Contributions	-	$8,973	$8,802	($171)
Total - Non Pay Object Classes	**-**	**$80,443**	**$67,681**	**($12,762)**

CWMD Research and Development – PPA

Budget Comparison and Adjustments

Comparison of Budget Authority and Request

Organization (Dollars in Thousands)	FY 2018 Enacted			FY 2019 President's Budget			FY 2020 President's Budget			FY 2019 to FY 2020 Total Changes		
	Pos.	FTE	Amount	Pos.	FTE	Amount	Pos.	FTE	Amount	Pos.	FTE	Amount
CWMD Research and Development	-	-	-	-	-	$80,443	-	-	$67,681	-	-	($12,762)
Total	**-**	**-**	**-**	**-**	**-**	**$80,443**	**-**	**-**	**$67,681**	**-**	**-**	**($12,762)**
Subtotal Discretionary - Appropriation	-	-	-	-	-	$80,443	-	-	$67,681	-	-	($12,762)

PPA Level I Description

The CWMD R&D PPA provides resources necessary to identify, explore, and demonstrate new technologies and capabilities that will help enable DHS and its partners to prevent, protect against, respond to, and mitigate nuclear, chemical, radiological, and biological threats and incidents.

The CWMD R&D PPA contains the following programs/projects:

Research and Development: This program covers basic and applied research related to radiological and nuclear threat detection; the evaluation of chemical and biological threat detection technology transition from S&T to CWMD; CWMD data analytics and anomaly detection R&D; and the SBIR project.

Technical Forensics: This program advances the U.S. Government's technical capability to rapidly, accurately, and credibly characterize and identify the nature, origin, and history of nuclear materials interdicted before a detonation. As mandated by the *Nuclear Forensics and Attribution Act, 2010 (P.L. 111-140)*, the National Nuclear Forensics Expertise Development program is the comprehensive U.S. Government effort to address the enduring challenge of sustaining a preeminent workforce of scientists and policymakers that are educated and trained in nuclear forensics-related specialties by funding research projects.

Detection Capability Development: This project supports capability development projects that are characterized as late-stage TRL (6-7) and are anticipated to lead to a materiel solution. CWMD acquisition activities adhere to the Department's integrated lifecycle management approach to develop, acquire, procure, deploy and sustain nuclear, chemical, radiological and biological detection systems for operational customers that operate the systems in the field.

Rapid Capabilities: CWMD executes rapid and/or sensitive acquisition development and procurement activities for nuclear, chemical, radiological and biological detection systems in response to emerging operational needs across the CWMD mission space. Rapid Capabilities initiatives implement Federal Acquisition Regulation (FAR)-based acquisition procedures; however, the program may also utilize DHS and CWMD-specific acquisition authorities to rapidly develop, procure and field capabilities that disrupt terrorist attempts to utilize weapons of mass destruction (WMD). For example, the Rapid Capabilities program optimizes innovation, and utilizes an agile approach to acquire and deploy small numbers of the initial increment of capability to immediately address emerging needs. The program then transitions the capability to a traditional program office for normalization, larger scale procurement, and capability advancement. Project requirements are informed by the need to expeditiously address vulnerabilities or threats, and are not typically known until the year of execution.

CWMD Research and Development – PPA
Budget Authority and Obligations

Budget Authority *(Dollars in Thousands)*	**FY 2018**	**FY 2019**	**FY 2020**
Enacted/Request	**-**	**$80,443**	**$67,681**
Carryover and/or Recoveries (Actual/Estimates/Projections)	-	$64,961	-
Rescissions to Current Year/Budget Year	-	-	-
Net Sequestered Resources	-	-	-
Reprogrammings/Transfers	-	-	-
Supplementals	-	-	-
Total Budget Authority	**-**	**$145,404**	**$67,681**
Collections – Reimbursable Resources	-	-	-
Total Budget Resources	**-**	**$145,404**	**$67,681**
Obligations (Actual/Estimates/Projections)	-	$145,404	$67,681
Personnel: Positions and FTE			
Enacted/Request Positions	-	-	-
Enacted/Request FTE	-	-	-
Onboard and Actual FTE; Includes Collections - Reimbursable Resources			
Onboard (Actual/Estimates/Projections)	-	-	-
FTE (Actual/Estimates/Projections)	-	-	-

CWMD Research and Development – PPA
Summary of Budget Changes

Budget Formulation Activity *(Dollars in Thousands)*	Positions	FTE	Amount
FY 2018 Enacted	-	-	-
FY 2019 President's Budget	-	-	**$80,443**
FY 2020 Base Budget	-	-	**$80,443**
Transfer to CWMD/R&D from CWMD/O&S for Technical Forensics	-	-	$2,600
Total Transfers	-	-	**$2,600**
Total Adjustments-to-Base	-	-	**$2,600**
FY 2020 Current Services	-	-	**$83,043**
Device Development	-	-	$2,059
Total, Program Increases	-	-	**$2,059**
Research and Development	-	-	($17,421)
Total, Program Decreases	-	-	**($17,421)**
FY 2020 Request	-	-	**$67,681**
FY 2019 To FY 2020 Change	-	-	**($12,762)**

CWMD Research and Development – PPA
Non Pay Budget Exhibits

Non Pay Summary

Organization *(Dollars in Thousands)*	**FY 2018 Enacted**	**FY 2019 President's Budget**	**FY 2020 President's Budget**	**FY 2019 to FY 2020 Total Changes**
CWMD Research and Development	-	$80,443	$67,681	($12,762)
Total	**-**	**$80,443**	**$67,681**	**($12,762)**
Discretionary - Appropriation	-	$80,443	$67,681	($12,762)

Non Pay by Object Class

Non-Pay Object Classes *(Dollars in Thousands)*	**FY 2018 Enacted**	**FY 2019 President's Budget**	**FY 2020 President's Budget**	**FY 2019 to FY 2020 Change**
21.0 Travel and Transportation of Persons	-	$173	$133	($40)
25.1 Advisory and Assistance Services	-	$12,119	$10,079	($2,040)
25.3 Other Goods and Services from Federal Sources	-	$14,536	$12,966	($1,570)
25.5 Research and Development Contracts	-	$44,642	$35,701	($8,941)
41.0 Grants, Subsidies, and Contributions	-	$8,973	$8,802	($171)
Total - Non Pay Object Classes	**-**	**$80,443**	**$67,681**	**($12,762)**

Non Pay Cost Drivers

Leading Non Pay Cost-Drivers *(Dollars in Thousands)*	FY 2018 Enacted	FY 2019 President's Budget	FY 2020 President's Budget	FY 2019 to FY 2020 Total Changes
Detection Capability Development	-	$30,941	$33,000	$2,059
Rapid Capabilities	-	$8,000	$8,000	$0
Research and Development	-	$37,002	$19,581	($17,421)
Technical Forensics	-	$4,500	$7,100	$2,600
Total-Non Pay Cost Drivers	**-**	**$80,443**	**$67,681**	**($12,762)**

Explanation of Non Pay Cost Drivers

Detection Capability Development: Supports capability development projects that are characterized as late stage TRL (6-7) and are anticipated to lead to a materiel solution to meet operator requirements.

Rapid Capabilities: Executes rapid and/or sensitive acquisition development and procurement activities for nuclear, chemical, radiological and biological detection systems in response to emerging operational needs across the CWMD mission space.

Research and Development: Covers basic and applied research related to radiological and nuclear threat detection; the evaluation of chemical and biological threat detection technology transition from S&T to CWMD; CWMD data analytics and anomaly detection R&D; and the SBIR project. In FY 2020, CWMD will de-emphasize basic research and will instead refocus on applied research to ensure that a technology pipeline is maintained in support of high priority CWMD needs.

Technical Forensics: Leads activities that advance the U.S. Government capability to rapidly, accurately, and credibly characterize and identify the nature, origin, and history of nuclear materials interdicted before a detonation. Expertise development funding transferred from the Operations and Support appropriation sustains a preeminent workforce of scientists educated and trained in nuclear forensics-related specialties by funding research projects.

CWMD Research and Development – PPA
Research and Development
Technology Readiness Level Exhibit

Research and Development

Project Description

This program covers basic and applied research related to radiological and nuclear threat detection; the evaluation of chemical and biological threat detection technology transition from S&T to CWMD; CWMD data analytics and anomaly detection R&D; and the SBIR project.

- **Problem:** Recurring analyses and reviews conducted by CWMD in conjunction with U.S. government partner agencies on radiological and nuclear detection have highlighted a number of technical areas that provide a focus for research activities to be conducted under the R&D program. Furthermore, there exists a need for new operational capabilities for counter WMD chem/bio detection.
- **Solution:** The R&D program explores innovative technologies that address gaps in U.S. R/N detection capabilities. These technologies also provide improvements in performance or a reduction in cost for R/N detection capabilities that support the CWMD mission. This program will also focus on transition of chem/bio technologies developed by interagency partners to operational capability.
- **Impact:** Capabilities developed under the R&D program can provide enabling technologies in support of the development R&D program or directly spur commercial development.

Sub-Projects

- *R/N Research and Development:* This sub-project enhances the Nation's ability to prevent the use of nuclear/radiological WMDs by developing break-through technologies that meet DHS operational requirements. The project increases the priority of research involving anomaly detection and data streaming in support of DHS operational customers while decreasing more basic long-term efforts. In turn, this R&D reprioritization will lead to more capability being delivered to operational customers in the field. It also fulfills CWMD's broader strategy of serving a role as an operational support organization.

- *Chem/Bio Development:* This sub-project will focus on transitioning Chem/Bio technologies developed by interagency partners into operational capabilities for CWMD. This effort will review TRL 5 counter WMD chem/bio detection technologies developed by others and transition them from the component or research prototype stage to higher TRL products which will serve as the basis for new CWMD operational capabilities.

- *Data Analytics:* This sub-project includes a family of R&D initiatives focused on technologies that integrate physical sensor data with other information streams (e.g., non-physical contextual and intelligence data), perform data analytics to determine patterns, and produce techniques for identifying anomalies. These activities will support global targeting and interdiction by domestic and global partners. The largest project within

this program is SIGMA, a multi-pronged approach to the wide-area monitoring and search mission space that was transitioned to CWMD/DNDO from the Defense Advanced Research Project Agency (DARPA) with shared funding in FY 2018.

- *Anomaly Detection:* This sub-project supports the development and implementation of a WMD detection sensor data and information integration system, which will supports global targeting and interdiction by domestic and foreign partners. The Anomaly Detection program is designed specifically to improve capabilities to prevent WMD terrorism as far away from targets in the homeland as possible.

- *SBIR Detector / User Interface:* This sub-project enables technological innovation by strengthening the role of small business concerns in Federally-funded R&D. The SBIR program is specifically focused on meeting Federal R&D needs to R/N detection. There is a need to identify, explore, develop, and demonstrate scientific and technological approaches that address gaps in R/N detection capabilities; significantly improve the performance of R/N detection, components, and systems; and/or significantly reduce the operational burden of these technologies..

FY 2018 Key Milestone Events

- N/A.

FY 2019 Planned Key Milestone Events

- *R/N Research and Development*: Conduct feasibility evaluation for mobile active interrogation using neutrons and thallium bromide based radioisotope identification device activities.
- *Chem/Bio Development*: Identify technologies developed by interagency partners that have the greatest potential to provide an enhanced mission capability; coordinate with DARPA SIGMA+ to include identifying and developing protocols used so that operational prototypes can be used on the same network.
- *Data Analytics*: Continue SIGMA pilots and technology demonstration opportunities; conduct mid-period review of the CWMD data analytics and anomaly detection strategy study and approach to supporting architecture.
- *Anomaly Detection*: Initiate new starts focused on R&D in anomaly detection capabilities in support of CWMD mission; complete assessment of scenario visualization tool from operational usage to CWMD-relevant data sets.
- *SBIR Detector/User Interface*: Initiate up to nine SBIR Phase I and up to two SBIR Phase II projects with an emphasis on networking detectors and big data analytics; transition new technologies to the open market or to CWMD end users.

FY 2020 Planned Key Milestone Events

- *R/N Research and Development*: Conduct critical design reviews for mobile active interrogation using neutrons activities; continue spiral development of thallium bromide based radioisotope identification device activities.
- *Chem/Bio Development*: Select performers to transition promising technologies from component or research prototype to an operational prototype unit that can be demonstrated to operational users; complete proof-of-concept demonstration of new capability and plan for operational

demonstration and technology transition.

- *Data Analytics*: Complete SIGMA pilots and technology demonstration opportunities and share lessons learned to inform requirements and system spirals; complete CWMD data analytics and anomaly detection strategy study and approach to supporting architecture.
- *Anomaly Detection*: Complete assessment of operational component-supplied import/export/financial transaction data for patterns of behavior for CWMD-relevant usage; transition relevant anomaly detection capabilities to operational end users that have shown potential in meeting CWMD operational needs through R&D.
- *SBIR Detector/User Interface*: Continue development of promising research capable of meeting CWMD operational end-user needs with an emphasis on networking detectors and big data analytics; transition new technologies to the open market or CWMD end users.

Overall Project Funding

(Dollars in Thousands)	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020
Project Funding	-	-	-	$37,002	$19,581
Obligations	-	-	-	-	-

Project Schedule

Research and Development Description	Planned Start Date	Planned Completion
FY 2019		
Mobile Active Interrogation Using Neutrons - Feasibility Evaluation	Ongoing	FY 2021 Q4
Thallium Bromide Handheld Detector - Feasibility Evaluation	Ongoing	FY 2022 Q2
Detection Capability Development of Chem/Bio technologies – Identify Technologies	FY 2019 Q4	FY 2024 Q2
Data Analytics and Anomaly Detection Implementation – Mid-period Strategy Review & Technology Demos	Ongoing	FY 2019 Q4
Fusion of Radiation Detectors with Large Scale Video Management Systems – Feasibility Evaluation & Design Review	Ongoing	FY 2021 Q4
FY 2020		
Mobile Active Interrogation Using Neutrons – Critical Design Reviews	Ongoing	FY 2021 Q4
Thallium Bromide Handheld Detector – Critical Design Reviews	Ongoing	FY 2022 Q2
Detection Capability Development of Chem/Bio technologies – Proof-of-Concept Demonstration & Transition Planning	Ongoing	FY 2024 Q2
Joint Enforcement and Data Intelligence – Proof-of-Concept Demonstration & Transition Planning	Ongoing	FY 2021 Q2
Networking Detectors and Associated Big Data Analytics – Feasibility Evaluation	Ongoing	FY 2021 Q4

Type of Research

Research under this program includes basic and applied research, and technology development (TRL 1-5); with the majority in TRL 3-5 for radiological/nuclear detection and technology development. This research also includes a review of TRL 5 counter WMD chem/bio detection technologies developed by others and transition them from the component or research prototype stage to higher TRL products Technologies developed under this program will undergo TRL changes as they mature through the research and development pipeline during budget years. The frequency of TRL changes will be dependent on the technology itself and the need it is aiming to address. In general, TRL changes within the program do occur annually.

Technology Readiness Level

TRL 1-5 for radiological/nuclear detection R&D & review of TRL 5 for chem/bio detection technologies. Technologies developed under this program will undergo TRL changes as they mature through the research and development pipeline during budget years. The frequency of TRL changes will be dependent on the technology itself and the need it is aiming to address. In general, TRL changes within the program do occur annually.

Transition Plans

- Transition to developmental R&D programs under CWMD Acquisition and Rapid Capabilities to meet specific needs for DHS Component(s) or Homeland Security Enterprise customers. There is a potential for commercialization as well. Technologies developed under this program will undergo transitions as they mature through the research and development pipeline during budget years. The frequency of transitions will be dependent on the technology itself and the need it is aiming to address.

Technical Forensics

Project Description

The Technical Forensics Program serves as the pre-detonation R/N materials forensics capability developer and works to validate methodologies that advance the United States Government capability to rapidly, accurately, and credibly characterize and identify the nature, origin, and history of nuclear materials. CWMD sustains a preeminent workforce of scientists educated and trained in nuclear forensics-related specialties.

- **Problem:** There is a need to assess, identify, develop, demonstrate, and operationalize scientific and technological approaches that address gaps in the nuclear forensics and attribution capabilities of the United States and to continuously improve the speed, quality, and confidence of pre-detonation bulk material nuclear forensics methodologies. Current technical nuclear forensics activities leverage the shrinking nuclear weapons complex which has been in decline since the end of the Cold War with nuclear scientists leaving the field for other pursuits.

- **Solution:** The program explores innovative, low-risk, later-stage technologies and methodologies. Specifically, Technical Forensics develops technologies and methodologies that:
  - Address capability gaps and weaknesses found in the National Strategic Five-Year Plan for Improving the Nuclear Forensics and Attribution Capabilities of the United States FY 2015 – 2019;
  - Assess current forensics laboratory performance, identify improvement areas, develop methodologies, and field solutions to enhance operational nuclear forensics capabilities; and
  - Develop pre-detonation material nuclear forensics signatures to determine material and statistical population characteristics that can uniquely identify linkages with known or predicted material characteristics.

  The Technical Forensics Program provides long term and continued investment to promote education and training within academia, the national and defense laboratories that perform nuclear forensics research, and the Federal workforce.

- **Impact:** Capabilities developed under Technical Forensics continuously improve the USG pre-detonation materials nuclear forensics operational capability. These improvements allow experts to reach technical conclusions about interdicted material based on known signatures, comparative samples of materials, and modeling of manufacturing processes to support attribution assessments for decision makers. In addition, Technical Advancement efforts support development of the next generation of nuclear forensic scientific expertise.

FY 2018 Key Milestone Events

- N/A.

FY 2019 Planned Key Milestone Events

- Finish production and certification of two certified reference materials for forensic method improvement and quality assurance purposes.
- Operate the laboratory-scale plutonium processing capability to produce two plutonium materials for signature development.

FY 2020 Planned Key Milestone Events

- Operate the laboratory-scale plutonium processing capabilities to produce plutonium materials for signature development.
- Support two research awards; one undergraduate summer school; one graduate fellowships; 4 post-doctorate fellowship positions.

Overall Project Funding

(Dollars in Thousands)	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020
Project Funding	-	-	-	$4,500	$7,100
Obligations	-	-	-	-	-

Project Schedule

Research and Development Description	Planned Start Date	Planned Completion
FY 2019		
Reference Material Development – Production and Certification of Reference Materials	Ongoing	FY 2019 Q4
Plutonium Processing Signatures – Signature Development from Plutonium Materials	Ongoing	FY 2019 Q4
Uranium Processing Signatures – Signature Development from Uranium Materials	Ongoing	FY 2019 Q4
FY 2020		
Data Evaluation Tools – Development and Demonstrate New Tools	FY 2020 Q2	FY 2020 Q4
Reference Material Development – Production and Certification of Reference Materials	Ongoing	FY 2020 Q4
Plutonium Processing Signatures – Signature Development from Plutonium Materials	Ongoing	FY 2020 Q4
Uranium Processing Signatures – Signature Development from Uranium Materials	Ongoing	FY 2020 Q4
Material Characterization – Characterization of Materials to Validate Signatures	FY 2020 Q2	FY 2020 Q4
Expertise Development: Academics and Laboratories – Education Support for Next Generation Scientists/Engineers	Ongoing	FY 2020 Q4

Type of Research

Basic, Applied, Developmental

Technology Readiness Level

TRLs1-7: Maintains the technical expertise required to execute the Nation's nuclear forensics mission through interdisciplinary R&D collaboration among students, academic departments, universities, and national laboratories.

Transition Plans

- Successful Technical Forensics methodologies and concepts will transition to operational customers through the Bulk Special Nuclear Material (SNM) Analysis Program.
- All research performed within the expertise development program is at the direction of other Federal research programs which are responsible for transitioning the research from TRL 1-3 into an operational method or tool.

Detection Capability Development

Project Description

Detection Capability Development projects incorporate the user requirements of DHS's Operational Components into CWMD sensor systems. It achieves this by coordinating its integrated lifecycle management and systems engineering lifecycle activities with the end-user community and managing the task execution of CWMD Solution Development Process (SDP) which governs CWMD acquisition activities including developmental activities of programs of record.

Recognizing that innovation can originate in a variety of sectors, CWMD has adopted a "commercial first" approach that gives preference for solutions available in the private sector marketplace. Using this approach, CWMD can leverage industry-led innovations and developments, resorting to a Federally-sponsored and managed development and acquisition process when no commercial solution is feasible or private industry chooses not to commercialize a product.

- **Problem:** Capability gaps exist across multiple pathways through which WMD can be transported. These capability gaps can to some degree be mitigated with non-materiel solutions but primarily require a materiel solution to be developed, acquired, and deployed to address the gap. Further, DHS operational users and CWMD recognize many deployed systems will be reaching their respective end-of-life and modernization and/or recapitalization efforts will be required to maintain or improve CWMD sensor capabilities. Additionally, potential COTS material solutions may require customization and will always require test and evaluation to ensure they meet operational and functional requirements.

- **Solution:** Through analyses of alternatives, threat assessments, preparation of documentation to prepare for materiel solution acquisition, and test and evaluation activities, CWMD can conduct the capability development effort necessary to acquire and deploy materiel solutions. Solutions will include data streaming and networking capabilities to improve targeting and situational awareness of CBRN threats.

- **Impact:** The capability development activities funded with this appropriation will support acquisition and deployment of counter-WMD devices that will partially or wholly address capability gaps and provide DHS operational users and other Federal users with commercially-available or next-generation CWMD devices.

Sub-Projects

- *International Rail:* This sub-project will acquire and deploy solutions to detect and categorize nuclear or other radioactive materials out of regulatory control entering the United States via freight rail cargo through the active Ports of Entry.

- *Maritime Non-Containerized Cargo (MNCC):* This sub-project's objective is to provide efficient and effective scanning of the most diverse cargo types – break bulk cargo (transported unpackaged in large quantities) and roll-on, roll-off (vehicles, bags, bundles, crates, loose materiel, and containerized liquid) – for R/N material entering the United States at sea POEs.

- *SIGMA:* This subproject, which transitioned to DHS from the DARPA, is a cost-effective, operationally practical, continuous and ubiquitous R/N detection capability. It includes testing of low cost radiation detectors with spectroscopic gamma and neutron sensing capability, packaged as automated and networked threat detection and identification capability with web-based command and control. SIGMA includes human portable and mobile detection equipment.

- *RPM Open Systems Architecture (ROSA*): This subproject is the follow on to Radiation Portal Monitor Replacement Program (RPM RP) activity and will explore an open systems architecture model as an option to recapitalize the remainder of the legacy RPM fleet beyond the 200 units planned under RPM RP. a set of hardware and software interfaces that enable assembly of an RPM from a set of commercial-off-the-shelf (COTS) components and allow for more agile technology insertion and reduced sustainment costs.

- *Enhanced Radiological Nuclear Inspection and Evaluation (ERNIE):* This sub-project is an advanced machine learning (ML) based approach to analyze RPM scans for greater overall system performance, includingimproved threat detection with reduced nuisance alarm rates.

- *Wearable Intelligent Nuclear Detection (WIND):* This sub-project will develop and characterize a highly-modular, multi-purpose, and human-portable (e.g., backpack or vest) system that greatly advances the ability to detect and interdict threats during wide area search missions. These advancements will inform the development and acquisition of the next backpack detection technology.

- *Radiation Awareness and Interdiction Network (RAIN):* This sub-project is intended to develop and characterize technologies for monitoring highway traffic and their on-ramps for vehicles carrying nuclear or other radioactive threat materials. RAIN technologies have integrated networked radiation sensors with vehicle detection and identification systems to allow actionable information on threat-carrying vehicles to be passed to law enforcement.

- *Nuclear and Radiological Imaging Platform (NRIP) ATD:* The sub-project combines the merits of passive and active technologies to develop new systems able to detect radiological and nuclear threats, regardless of the amount of shielding or the complexity of cargo, in primary mode with minimal impact to the flow of commerce.

- *Mobile Urban Radiation Search (MURS):* The goal of the this sub-project is to efficiently migrate the knowledge and technology of previous stand-off and long range detection projects into a production-ready, compact, next-generation mobile radiation detection platform. The MURS systems leverages state-of-the-art radiation detection, identification, and localization, fused with contextual sensing such as video, Light Detection and Ranging (LIDAR), and high resolution GPS.

- *Helium-3 Alternative Implementation Backpack Program (HAIBP):* The sub-project is intended to replace current capabilities provided by the legacy Helium-3 backpack radiation detection systems. As part of this program, the HAIBP prototype project will leverage the commercial market and support a rapid modification to develop improved performance and suitability of the backpack or vest configured system, and expand the capability of the wearable detection system by including radionuclide identification and data transfer.

- *Common Viewer:* This sub-project is intended to provide a single user interface for CBP personnel to access and control various systems (e.g., radiation detection equipment (RDE), non-intrusive inspection (NII) systems, ancillary control systems) simultaneously, allowing both CBP officers on the ground, staff at the National Targeting Center, and CBP remote operations / analysis centers to check real-time radiographic, spectrographic, optical, and x-ray imaging data against traveler, cargo, and conveyance information for comparison against law enforcement, intelligence, and other enforcement data.

- *BioDetection 21 (BD21):* The 1 sub-project will largely focus on market research, technology demonstrations, and technology assessments to build upon lessons learned from the ongoing BD21 Prototype effort. The BD21 acquisition program is intended to replace BioWatch by deploying an integrated capability that provides timely anomaly detection, on-site presumptive identification, and notification of the presence of aerosolized biological threat agents. BD21 will enable: (1) first responders to take quick actions that minimize the impact of a biological release on the surrounding population; and (2) expeditious delivery of biological samples to diagnostic laboratories under the U.S. Department of Health & Human Services (HHS) for confirmatory analysis that could inform decisions on deployment of medical countermeasures.

- *Next-generation CWMD Sensor Programs*: These initiatives include a number of required solutions based on capability gaps, anticipated recapitalization of deployed equipment, and/or solutions that have otherwise been identified and documented by DHS operational users as a required capability. These initiatives also include continuous efforts to improve legacy systems capabilities to communicate and network with next-generation systems.

FY 2018 Key Milestone Events

- N/A.

FY 2019 Planned Key Milestone Events

- IRAIL: Conduct RDE / NII integration and testing.
- MNCC: Begin to develop programmatic approach and artifacts required for program governance.
- SIGMA: Continue SIGMA pilots and technology demonstration opportunities.
- ROSA: Develop programmatic approach and artifacts required for program governance.
- ERNIE: Complete adaptation of ERNIE for land border crossings, including personally-owned vehicles.
- WIND: Characterization of completed Performance Test Units (PTU) and two-month spiral development.
- RAIN: Complete operational characterization of PTUs.
- NRIP: Complete closeout of the Passport NRIP contract.
- MURS: Deliver five additional units to operational end users along CWMD-identified pathways.

- Next-generation sensors: Conduct market research and prototyping, and prepare program documentation for one or more next-generation CWMD sensors.
- HAIBP: Initial Article Delivery.
- Common Viewer: Prototype system deployed to initial CBP POE.

FY 2020 Planned Key Milestone Events

- IRAIL: Complete RDE / NII integration and testing.
- MNCC: Complete acquisition planning and market research and initiate procurement process.
- SIGMA: Complete SIGMA pilots and technology demonstration opportunities.
- ROSA: Award Contract.
- ERNIE: Complete adaptation of ERNIE to next generation of multichannel RPMs.
- WIND: Complete operational characterization of PTUs.
- NRIP: Complete closeout deployment at Conley Terminal at Mass Port.
- MURS: Complete report on suitability and user requirements to inform Analysis of Alternatives.
- BioDetection 21: Initiate AoA or Alternative Analysis (AA) (as determined at the Acquisition Decision Event 1 (ADE-1) “Analyze/Select” milestone).
- Next-generation sensors: Conduct market research and prototyping, and prepare program documentation for one or more next-generation CWMD sensors.

Overall Project Funding

(Dollars in Thousands)	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020
Project Funding	-	-	-	$30,941	$33,000
Obligations	-	-	-	-	-

Project Schedule

Research and Development Description	Planned Start Date	Planned Completion
FY 2019		
IRAIL: Conduct RDE / NII integration and testing.	FY 2019 Q1	Ongoing
MNCC: Develop programmatic approach and artifacts required for program governance.	FY 2019 Q1	Ongoing
HAIBP: Initial Article Delivery.	Ongoing	FY 2019 Q4
Common Viewer: Prototype system deployed to initial CBP POE.	Ongoing	FY 2019 Q4
FY 2020		
IRAIL: Complete RDE / NII integration and testing.	FY 2019 Q1	FY 2020 Q4
MNCC: Complete acquisition planning and market research and initiate procurement process.	FY 2019 Q1	FY 2020 Q4
WIND: Complete operational characterization of PTUs.	Ongoing	FY 2020 Q4
NRIP: Complete closeout deployment at Conley Terminal at Mass Port.	FY 2012 Q1	FY 2020 Q4
MURS: Complete report on suitability and user requirements to inform Analysis of Alternatives.	Ongoing	FY 2020 Q4
BD21: Conduct Analysis of Alternatives	FY 2020 Q1	FY 2021 Q2

Type of Research

Development: Technology Demonstration; System Development.

Technology Readiness Level

The FY 2020 funding supports capability development projects that are characterized as TRLs 6-7 for “System Prototypes in Relevant Environment” and “System Prototypes in Operational Environment.” These testing activites are anticipated to lead to a materiel solution to meet operator requirements.

Transition Plans

The detection capabilities under these programs will be transitioned to DHS Operational Component(s) (CBP, USCG, TSA, etc.) after test and evaluation to ensure they meet operational requirements, and an operational readiness review is conducted with the DHS operational component(s) deploying the capability. Post-implementation Review activities are conducted after the initial deployed units have been in operational use for 12 to 18 months to provide the necessary information to determine the degree to which a materiel investment operating in its intended environment has met the needed capability.

Throughout the life of the capability, CWMD works collaboratively with the DHS operational components to manage the equipment configuration to ensure it continues to meets its operational requirements, as well as collect and analyze operational performance and maintenance data to maximize performance per maintenance dollar and inform future procurement requirements.

The Common Viewer prototype effort will transition to an acquisition and deployment program in FY 2020.

Rapid Capabilities

Project Description

Rapid Capabilities: CWMD executes rapid and/or sensitive acquisition development and procurement activities for nuclear, chemical, radiological and biological detection systems in response to emerging operational needs across the CWMD mission space. Rapid Capabilities initiatives implement Federal Acquisition Regulation (FAR)-based acquisition procedures; however, the program may also utilize DHS and CWMD-specific acquisition authorities to rapidly develop, procure and field capabilities that disrupt terrorist attempts to utilize weapons of mass destruction (WMD). For example, the Rapid Capabilities program optimizes innovation, and utilizes an agile approach to acquire and deploy small numbers of the initial increment of capability to immediately address emerging needs. The program then transitions the capability to a traditional program office for normalization, larger scale procurement, and capability advancement. Project requirements are informed by the need to expeditiously address vulnerabilities or threats, and are not typically known until the year of execution.

- **Problem:** A quickly evolving threat environment can outpace traditional capability acquisition processes and timelines and make the Nation vulnerable to WMD attack and/or impede response to an attack.

- **Solution:** The Rapid Capabilities programs and activities place prototype capabilities in the field for operator use to support their mission.

- **Impact:** Prototype capability provided makes the Nation more prepared and resilient to defend against WMD attacks and to response if an attack occurs. Additionally, the lessons learned by operating prototype equipment greatly inform follow-on programs of record to ensure technical and operational requirements are met and CONOPs to support the capability are quickly matured.

FY 2018 Key Milestone Events

- N/A.

FY 2019 Planned Key Milestone Events

- Begin prototype operational evaluation of BD21 Prototype effort via deployment of biodetection equipment prototypes to operators for evaluation.
- Begin prototype operational evaluation of multi-modal prototype effort via deployment of CWMD detection equipment into cargo pathways.

FY 2020 Planned Key Milestone Events

- Finish data collection on BD21 Prototype effort launched in FY 2019 to support program of record initiation.
- Partner with Operational Components to identify emerging capability gaps to consider for future prototyping efforts.

Overall Project Funding

(Dollars in Thousands)	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020
Project Funding	-	-	-	$8,000	$8,000
Obligations	-	-	-	-	-

Project Schedule

Research and Development Description	Planned Start Date	Planned Completion
FY 2019		
Equipment	FY 2019 Q1	Ongoing
Technology Maturation	FY 2019 Q1	Ongoing
FY 2020		
Equipment	FY 2020 Q1	Ongoing
Technology Maturation	FY 2020 Q1	Ongoing

Type of Research

Developmental: Research anticipated to be conducted in the operational environment with rapid fielding of high maturity prototype systems in an operationally relevant environment to fill operational gaps and/or to inform future acquisition programs by providing data to support requirements generation and/or alternatives analysis.

Technology Readiness Level

Rapid Capabilities will meet emerging operational challenges as identified by the operational components with innovative and emerging technologies. The technologies will be matured into operational prototypes to support CWMD missions and provide user evaluation of prototype capabilities to support follow-on acquisition activities to ensure an enduring CWMD capability.

Transition Plans

- BD21 Prototype data and alternatives analysis will be transitioned to BD21 acquisition program to inform requirements and support acquisition documentation development, such as the Concept of Operations (CONOPs), Operational Requirements Document (ORD), Life Cycle Cost Estimate (LCCE), etc.

Department of Homeland Security

Countering Weapons of Mass Destruction Office

Federal Assistance

Fiscal Year 2020
Congressional Justification

Table of Contents

Federal Assistance

Budget Comparison and Adjustments

Comparison of Budget Authority and Request

Organization (Dollars in Thousands)	FY 2018 Enacted			FY 2019 President's Budget			FY 2020 President's Budget			FY 2019 to FY 2020 Total Changes		
	Pos.	FTE	Amount	Pos.	FTE	Amount	Pos.	FTE	Amount	Pos.	FTE	Amount
Capability Building	-	-	-	-	-	$64,663	-	-	$64,663	-	-	-
Total	**-**	**-**	**-**	**-**	**-**	**$64,663**	**-**	**-**	**$64,663**	**-**	**-**	**-**
Subtotal Discretionary - Appropriation	-	-	-	-	-	$64,663	-	-	$64,663	-	-	-

The Department's Countering Weapons of Mass Destruction (CWMD) Office exists to protect the American people and the homeland from the dangers posed by hostile state and non-state actors who would acquire and use nuclear, chemical, radiological, or biological materials in the form of weapons of mass destruction (WMD) to harm Americans or U.S. interests. The CWMD Office does this through its prevention and detection mission activities. This mission aligns with the first Pillar of the President's National Security Strategy.

The CWMD Office supports the frontline operations of DHS and its partners, and addresses critical vulnerabilities that help communities prepare and build capacity in detecting, identifying, responding to, and mitigating nuclear, chemical, radiological, and biological threats and incidents. The CWMD Office's Federal Assistance (FA) aligns operational programs and activities across the WMD threat space and allows for consistent and persistent engagement with local jurisdictions, DHS operating components, and international operators partnered with DHS in furtherance of the enhanced global detection architecture and information sharing in order to protect against an attack against the people, territory, or interests of the United States.

Federal Assistance
Budget Authority and Obligations

Budget Authority *(Dollars in Thousands)*	FY 2018	FY 2019	FY 2020
Enacted/Request	**-**	**$64,663**	**$64,663**
Carryover and/or Recoveries (Actual/Estimates/Projections)	-	$37,471	-
Rescissions to Current Year/Budget Year	-	-	-
Net Sequestered Resources	-	-	-
Reprogrammings/Transfers	-	-	-
Supplementals	-	-	-
Total Budget Authority	**-**	**$102,134**	**$64,663**
Collections – Reimbursable Resources	-	-	-
Total Budget Resources	**-**	**$102,134**	**$64,663**
Obligations (Actual/Estimates/Projections)	-	$102,134	$64,663
Personnel: Positions and FTE			
Enacted/Request Positions	-	-	-
Enacted/Request FTE	-	-	-
Onboard and Actual FTE; Includes Collections - Reimbursable Resources			
Onboard (Actual/Estimates/Projections)	-	-	-
FTE (Actual/Estimates/Projections)	-	-	-

*The Total Budget Authority for FY2019 includes carry-over from prior year DNDO Federal Assistance Appropriations that are under the direction of the Countering Weapons of Mass Destruction Office.

Federal Assistance
Summary of Budget Changes

Budget Formulation Activity *(Dollars in Thousands)*	Positions	FTE	Amount
FY 2018 Enacted	-	-	-
FY 2019 President's Budget	-	-	**$64,663**
FY 2020 Base Budget	-	-	**$64,663**
FY 2020 Current Services	-	-	**$64,663**
FY 2020 Request	-	-	**$64,663**
FY 2019 To FY 2020 Change	-	-	-

Federal Assistance
Non Pay Budget Exhibits

Non Pay Summary

Organization *(Dollars in Thousands)*	**FY 2018 Enacted**	**FY 2019 President's Budget**	**FY 2020 President's Budget**	**FY 2019 to FY 2020 Total Changes**
Capability Building	-	$64,663	$64,663	-
Total	-	**$64,663**	**$64,663**	-
Discretionary - Appropriation	-	$64,663	$64,663	-

Non Pay by Object Class

Non-Pay Object Classes *(Dollars in Thousands)*	**FY 2018 Enacted**	**FY 2019 President's Budget**	**FY 2020 President's Budget**	**FY 2019 to FY 2020 Change**
21.0 Travel and Transportation of Persons	-	$260	$260	-
25.1 Advisory and Assistance Services	-	$8,660	$8,660	-
25.2 Other Services from Non-Federal Sources	-	$596	$596	-
25.3 Other Goods and Services from Federal Sources	-	$12,044	$12,044	-
41.0 Grants, Subsidies, and Contributions	-	$43,103	$43,103	-
Total - Non Pay Object Classes	**-**	**$64,663**	**$64,663**	**-**

Capability Building – PPA

Budget Comparison and Adjustments

Comparison of Budget Authority and Request

Organization (Dollars in Thousands)	FY 2018 Enacted			FY 2019 President's Budget			FY 2020 President's Budget			FY 2019 to FY 2020 Total Changes		
	Pos.	FTE	Amount	Pos.	FTE	Amount	Pos.	FTE	Amount	Pos.	FTE	Amount
Capability Building	-	-	-	-	-	$64,663	-	-	$64,663	-	-	-
Total	**-**	**-**	**-**	**-**	**-**	**$64,663**	**-**	**-**	**$64,663**	**-**	**-**	**-**
Subtotal Discretionary - Appropriation	-	-	-	-	-	$64,663	-	-	$64,663	-	-	-

PPA Level I Description

The Capability Building PPA funds programs and activities that provide chemical, biological, radiological, nuclear, and medical support, as well as readiness activities, in support of local jurisdictions, international operators, and DHS operating components. The CWMD Office pursues this by establishing, maintaining, and supporting programs and activities to defend against WMD, and combat bio-threats and pandemics.

This PPA includes the following Programs:

Training, Exercises, and Readiness

Training: The Training program supports local jurisdictions and DHS component personnel in developing or enhancing their training capabilities. The CWMD Office's training mission enhances detection and ensures that operators with countering weapons of mass destruction responsibilities receive high quality, standards-based training delivered in both classroom and field settings which is tailored to meet their needs. Training will establish procedures and processes for an integrated program within the CWMD Office and with partner Chemical, Biological, Radiological, and Nuclear (CBRN) agencies, which may include grant funds for external training. The CWMD Office's training personnel will maintain a standards-based CWMD training curriculum, support current and identify potential future schoolhouses for course delivery, and work to implement training standards, both internal to the CWMD Office and with external agencies. Field-delivered training provides operators instruction in their operating environment on the proper radiological, nuclear, biological, and chemical detection procedures from the point of initial detection through event resolution. This training helps partner agencies evaluate the effectiveness of their detection capabilities in an actual operating environment, compared to the classroom instruction. This may include grant funds for external training. The field training events complement and help validate the effectiveness of classroom training and exercises designed to promote readiness, maximizing capabilities of operators to perform their countering weapons of mass destruction missions. Field Training is also funded, in part, by Operations and Support for Federal travel, technical support activities, and minor procurements that enable the safe and secure fabrication, storage, shipping, and handling of radioactive material and related training aids.

Exercises: The Exercises program provides assistance and support to Federal and local responders and operators in the design, development, conduct, and reporting of exercises. This process helps the CWMD Office identify gaps and improve CWMD capability across DHS and the US Government. The Exercise project seeks to validate and enhance capabilities and systems essential to counter threats of terrorism from the use of weapons of mass destruction. This is accomplished by providing a range of support service expertise to operational partners and stakeholders. The Exercise project regularly updates mission-specific exercise materials, to include a variety of templates, tools, and planning guidance for direct use by the CWMD Office's exercise planners, stakeholders and partners. These proven exercise practices are all in accordance with the Homeland Security Exercise and Evaluation Program (HSEEP) methodology and are also applicable for exercise requirements not associated with the HSEEP methodology. The level of direct support provided for the planning, design, execution, and evaluation of exercises is dependent upon the stakeholder's level of knowledge and experience in conducting the CWMD mission, as well as the availability of resources to the requesting stakeholder. Support requests received by the Exercise project are to lead the planning, design, conduct, and evaluation of the exercise.

Readiness: The Readiness program serves to develop policy, plans, and exercises related to radiological, nuclear, and biological detection, chemical defense, infectious diseases, and health security to support the DHS mission. Readiness support may include the granting of financial assistance funds or equipment consistent with Federal grant regulations. The Readiness project provides direct support by means of the CWMD Office's Federal employees and service contracts. The project specifically supports operational partners' readiness by: 1) directly coordinating with operational partners to identify and prioritize capability gaps that are actionable; 2) institutionalizing the CWMD Office's operations support focus and culture by working directly with DHS components and other operational partners who counter WMD to assess detection operations; 3) measuring progress against increases in fielded operational capabilities by evaluating the effectiveness of local Concepts of Operation (CONOPs) & Tactics, Techniques, and Procedures (TTP) and efficient use of equipment; and 4) assessing the means to integrate pathway-based State and local detection capabilities with other response activities through focused training, exercises, and further coordination points during threat scenarios. The CWMD Office strategy utilizes a defense in depth posture that attempts to maximize detection opportunities from the initial entry or assembly point to the intended target area. This support includes developing and integrating local or regional programs into a national detection structure, guiding the development of concepts of operations (CONOPs) and standard operating procedures (SOPs).

The Readiness project includes Chemical Defense Support through which the CWMD Office's programs and activities enhance Federal and local operations and DHS component ability to effectively address chemical threats. Funding in the FA appropriation provides support for State & local CWMD capability enhancements based on functional requirements.

Mobile Detection Deployment Units (MDDU): MDDUs are complementary detection assets designed to augment Federal and local operator detection and reporting capabilities. MDDUs may be deployed to temporarily augment local jurisdiction steady-state capabilities, in support of large-scale public gatherings, in response to intelligence-driven requirements, and for multi-agency training and exercise activities.

The MDDU Project includes six trailer-based units that are maintained at various sites across the United States and are outfitted with detection equipment. Requests to deploy a MDDU by Federal and local agencies are evaluated based on an assessment of the event's risk and on the readiness of the region to incorporate the MDDU into their operations. A trailer may deploy as a complete unit or partial complements of equipment may be shipped to a deployment location to meet specific needs of the requesting agency. By shipping equipment only instead of deploying a full MDDU package, i.e., trailer, each deployment uses fewer resources allowing the project to meet the anticipated increased demand for MDDU support. This

package can be accompanied by one or more subject-matter experts to provide training, operational recommendations, and equipment technical support, and to ensure the detectors are properly managed and returned to the MDDU at the end of the limited engagement. This agile model will allow the project to support additional requests.

Information Coordination and Continuity: The CWMD Information Coordination and Continuity program builds operational information integration across the countering weapons of mass destruction mission areas to provide executive support, situational awareness, and operational readiness. This will include scalable operations coordination needed to support the Department's information sharing requirements and serves as a critical touch point for the Department as it coordinates and shares relevant information related to WMD and provides alerts and notifications of incidents. For the Information Coordination portion of this project, Federal Assistance money will allow for the procurement of qualified and experienced CWMD Office contract personnel capable of obtaining, monitoring, and reporting information related to the CWMD Office's operations 24 hours a day, seven days a week, 365 days per year through rotating shifts, at the Department of Homeland Security's National Operations Center (NOC). This capability builds, supports, and enables the CWMD Office to have a forward leaning and agile staff that can support the mission under any operational condition.

Work performed under this project also supports the CWMD Office's Continuity Program that includes continuity of operations and continuity of government.

Biological Support

The Biological Support program primarily supports the CWMD Office's efforts to safeguard against biological threats under the BioWatch Program. These activities are designed to provide early warning and characterization of biological events of national significance, and provide local jurisdictions and fielded DHS component personnel with support and guidance needed to effectively address biological threats. The Federal Assistance appropriation provides resources that support field operations for the bio-detection solution.

Bio-Detection Operations: The CWMD Office's bio-detection capability informs local jurisdictions, international operators, and DHS operating component personnel decision-making about high consequence biological threats. The program supports bio-detection systems, supplements operational coordination of DHS biological defense activities, and supports preparedness for biological and chemical events to help communities build capabilities to prepare, respond, and recover. Field Operations provides subject matter expertise, biological detection capability, and situational awareness to operational State, local, tribal, and territorial officials and stakeholders. The program uses cooperative agreements with State and local jurisdictions to operate and maintain bio-detection capabilities to include personnel and supplies for the collection and delivery of detection unit samples to laboratories, maintenance of the detection equipment, some laboratory personnel, and coverage of additional resources required as needed for special events in operational jurisdictions. The CWMD Office collaborates continually with operational partners, to ensure that detection capabilities provide the greatest level of protection possible to the public through multiple layers of defense.

Securing the Cities

Securing the Cities: Using the authorities of the Securing the Cities Program, the CWMD Office enhances the ability of the United States to detect and prevent terrorist attacks and other high-consequence events utilizing nuclear or other radiological materials that pose a risk to homeland security in high-risk urban areas (as used in Section 2003 of the Homeland Security Act of 2002, as amended). The STC Program is a critical aspect of the CWMD Office's strategy utilizing a defense in depth posture that attempts to maximize detection opportunities from the initial entry or assembly point to the intended target area. The STC Program includes equipment procurement, developing and integrating the STC partner programs into a national detection structure, and guiding the development of CONOPs and standard operating procedures (SOPs). The CWMD Office also provides training and exercise products/equipment via cooperative agreements or grants in order to ensure that weapons- or material-detection is integrated into day-to-day operations.

Although major metropolitan areas will remain the ideal targets for adversaries attempting to employ nuclear or radiological weapons against the United States, adversaries must traverse air, land, and/or sea pathways to reach the target area. These pathways may extend hundreds to thousands of miles from the potential target. The STC Program will provide dedicated Federal assistance funds and/or equipment via cooperative agreements with the designated jurisdictions. The CWMD Office would use Training, Exercises, and Readiness funds, as appropriate, to support STC Program implementations. The intent is to better protect population centers by shifting focus from the adversary's potential targets to include the threat pathways into and within the high-risk urban areas' broader region.

Programs	Projects	General Description
Training, Exercises, and Readiness	**Training**	The Training Project supports detection mission area operational stakeholders. Training establishes qualification standards for detection operations, builds curricula to support the standards, enables agencies and their instructors to teach the material, and captures feedback used for process and product improvement. Field-delivered training provides operators instruction in their operating environment on the proper radiological, nuclear, biological, and chemical detection procedures from the point of initial detection through event resolution. This training helps partner agencies evaluate the effectiveness of their detection capabilities in an actual operating environment, compared to the classroom instruction.
	Exercises	The Exercises Project supports Federal and local first responders in developing, enhancing and validation of plans, policies, procedures, and communications, with operators and first responders. The Exercises Program supports the development, validation, and dissemination of exercise templates, guidance, and standards; validates operational capabilities per Federal, state, and local plans procedures and protocols.
	Readiness	The Readiness program provides mission-related engagements with Federal, State, local, territorial, and tribal jurisdictions including DHS component personnel to support national preparedness for chemical, biological, radiological, and nuclear events and to reduce the risk of a successful deployment of a weapon of mass destruction and the movement of materials into the United States. Readiness support may include the granting of financial assistance funds or equipment consistent with Federal grant regulations. This support includes developing and integrating local or regional programs into a national detection structure, guiding the development of concepts of operations (CONOPs), and standard operating procedures (SOPs).
	MDDU	MDDUs are complementary detection assets designed to temporarily augment Federal and first responder detection and reporting capabilities. MDDUs may be deployed to temporarily augment State and local steady-state capabilities, in support of large-scale public gatherings, in response to intelligence-driven requirements, and multi-agency training and exercise activities. Each MDDU contains detection equipment housed in a mobile trailer package, capable of being deployed anywhere within the United States and its territories. These detection packages are maintained at various sites across the United States.
	Information Coordination and Continuity	The CWMD Information Coordination and Continuity (ICC) project builds operational information integration across the CWMD mission areas to provide executive support, situational awareness, and operational readiness. Supports the Department's information sharing requirements and serves as a critical touch point for the Department.
Biological Support	**Bio-detection Operations**	CWMD utilizes cooperative agreements that are established with State and local jurisdictions to operate and maintain bio-detection capabilities to include personnel and supplies for the collection and delivery of detection unit samples to laboratories, maintenance of the detection equipment, some laboratory personnel and coverage of additional resources required as needed for special events in operational jurisdictions. These activities are paired with other operational support activities to provide the bio-detection capability.
Securing the Cities	**Securing the Cities Program**	The Securing the Cities (STC) program provides resources to the highest risk metropolitan regions that the CWMD Office already works with, and to additional high-risk urban areas based on threat assessments or vulnerabilities. STC seeks to reduce the risk of a successful deployment of weapons of mass destruction and the movement of materials into major metropolitan regions.

Capability Building – PPA
Budget Authority and Obligations

Budget Authority *(Dollars in Thousands)*	**FY 2018**	**FY 2019**	**FY 2020**
Enacted/Request	**-**	**$64,663**	**$64,663**
Carryover and/or Recoveries (Actual/Estimates/Projections)	-	$37,471	-
Rescissions to Current Year/Budget Year	-	-	-
Net Sequestered Resources	-	-	-
Reprogrammings/Transfers	-	-	-
Supplementals	-	-	-
Total Budget Authority	**-**	**$102,134**	**$64,663**
Collections – Reimbursable Resources	-	-	-
Total Budget Resources	**-**	**$102,134**	**$64,663**
Obligations (Actual/Estimates/Projections)	-	$102,134	$64,663
Personnel: Positions and FTE			
Enacted/Request Positions	-	-	-
Enacted/Request FTE	-	-	-
Onboard and Actual FTE; Includes Collections - Reimbursable Resources			
Onboard (Actual/Estimates/Projections)	-	-	-
FTE (Actual/Estimates/Projections)	-	-	-

Capability Building – PPA
Summary of Budget Changes

Budget Formulation Activity *(Dollars in Thousands)*	Positions	FTE	Amount
FY 2018 Enacted	-	-	-
FY 2019 President's Budget	-	-	**$64,663**
FY 2020 Base Budget	-	-	**$64,663**
FY 2020 Current Services	-	-	**$64,663**
FY 2020 Request	-	-	**$64,663**
FY 2019 To FY 2020 Change	-	-	-

Capability Building – PPA
Non Pay Budget Exhibits

Non Pay Summary

Organization *(Dollars in Thousands)*	**FY 2018 Enacted**	**FY 2019 President's Budget**	**FY 2020 President's Budget**	**FY 2019 to FY 2020 Total Changes**
Capability Building	-	$64,663	$64,663	-
Total	**-**	**$64,663**	**$64,663**	**-**
Discretionary - Appropriation	-	$64,663	$64,663	-

Non Pay by Object Class

Non-Pay Object Classes *(Dollars in Thousands)*	**FY 2018 Enacted**	**FY 2019 President's Budget**	**FY 2020 President's Budget**	**FY 2019 to FY 2020 Change**
21.0 Travel and Transportation of Persons	-	$260	$260	-
25.1 Advisory and Assistance Services	-	$8,660	$8,660	-
25.2 Other Services from Non-Federal Sources	-	$596	$596	-
25.3 Other Goods and Services from Federal Sources	-	$12,044	$12,044	-
41.0 Grants, Subsidies, and Contributions	-	$43,103	$43,103	-
Total - Non Pay Object Classes	**-**	**$64,663**	**$64,663**	**-**

Non Pay Cost Drivers

Leading Non Pay Cost-Drivers *(Dollars in Thousands)*	FY 2018 Enacted	FY 2019 President's Budget	FY 2020 President's Budget	FY 2019 to FY 2020 Total Changes
Training, Exercises, and Readiness	-	$14,470	$14,470	-
Biological Support	-	$25,553	$25,553	-
Securing the Cities	-	$24,640	$24,640	-
Total – Non Pay Cost Drivers	**-**	**$64,663**	**$64,663**	**-**

Explanation of Non Pay Cost Drivers

Training, Exercises and Readiness: Training, Exercises, and Readiness programs provide support to local jurisdiction and DHS operating Components in order to reduce the risk of a successful deployment of a weapon of mass destruction and the movement of materials into major metropolitan areas and regions. Includes readiness programs and activities that provide mission-related training, exercises, field support, and capability enhancement for local jurisdictions and DHS component personnel to support preparedness for chemical, biological, radiological, and nuclear events.

Biological Support: Biological Support programs primarily support CWMD's efforts to safeguard against biological threats. These activities are designed to provide early warning and characterization of biological events of national significance, and provide local jurisdictions and fielded DHS component personnel with support and guidance needed to effectively address biological threats.

Securing the Cities: The Securing the Cities (STC) program provides resources to the highest risk metropolitan regions that the CWMD Office already works with, and to additional high-risk urban areas based on threat assessments or vulnerabilities. STC seeks to reduce the risk of a successful deployment of radiological/nuclear weapon of mass destruction and the movement of materials into major metropolitan regions.

Department of Homeland Security

Office of Health Affairs

Budget Overview

Fiscal Year 2020

Congressional Justification

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Office of Health Affairs

Appropriation Organization Structure

Organization Name	Level	Fund Type (* Includes Defense Funding)
Office of Health Affairs	**Component**	
Operations and Support	**Appropriation**	
Mission Support	PPA	Discretionary - Appropriation
Chemical and Biological Readiness	PPA	Discretionary - Appropriation
Health and Medical Readiness	PPA	Discretionary - Appropriation
Integrated Operations	PPA	Discretionary - Appropriation

Office of Health Affairs
Strategic Context

Component Overview

With the transfer of its functions to the Countering Weapons of Mass Destruction Office (CWMD) and the Management Directorate's Office of the Chief Human Capital Officer (OCHCO), no funds are included in the Office of Health Affairs (OHA) for the Fiscal Year (FY) 2019 President's Budget or the FY 2020 President's Budget. Further information on funding for those functions can be found in the FY 2020 President's Budget for CWMD and the Management Directorate.

Office of Health Affairs
Budget Comparison and Adjustments

Budget Comparison with FY 2019 Annualized CR

Organization *(Dollars in Thousands)*	FY 2018 Enacted	FY 2019 Annualized CR	FY 2019 President's Budget	FY 2020 President's Budget
Operations and Support	**$121,569**	**$121,569**	**-**	**-**
Mission Support	$28,419	$28,419	-	-
Chemical and Biological Readiness	$79,130	$79,130	-	-
Health and Medical Readiness	$4,620	$4,620	-	-
Integrated Operations	$9,400	$9,400	-	-
Total	**$121,569**	**$121,569**	**-**	**-**

Office of Health Affairs
Comparison of Budget Authority and Request

Organization (Dollars in Thousands)	FY 2018 Enacted			FY 2019 President's Budget			FY 2020 President's Budget			FY 2019 to FY 2020 Total Changes		
	Pos.	FTE	Amount	Pos.	FTE	Amount	Pos.	FTE	Amount	Pos.	FTE	Amount
Operations and Support	103	96	$121,569	-	-	-	-	-	-	-	-	-
Total	**103**	**96**	**$121,569**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Subtotal Discretionary - Appropriation	103	96	$121,569	-	-	-	-	-	-	-	-	-

Component Budget Overview

With the transfer of its functions to the Countering Weapons of Mass Destruction Office (CWMD) and the Management Directorate's Office of the Chief Human Capital Officer (OCHCO), no funds are included in the Office of Health Affairs (OHA) for the Fiscal Year (FY) 2019 President's Budget or the FY 2020 President's Budget. Further information on funding for those functions can be found in the FY 2020 President's Budget for CWMD and the Management Directorate.

Office of Health Affairs
Budget Authority and Obligations

Budget Authority *(Dollars in Thousands)*	FY 2018	FY 2019	FY 2020
Enacted/Request	**$121,569**	**-**	**-**
Carryover and/or Recoveries (Actual/Estimates/Projections)	$3,728	-	-
Rescissions to Current Year/Budget Year	-	-	-
Net Sequestered Resources	-	-	-
Reprogrammings/Transfers	$2,025	-	-
Supplementals	-	-	-
Total Budget Authority	**$127,322**	**-**	**-**
Collections – Reimbursable Resources	$47,716	-	-
Total Budget Resources	**$175,038**	**-**	**-**
Obligations (Actual/Estimates/Projections)	$170,229	-	-
Personnel: Positions and FTE			
Enacted/Request Positions	103	-	-
Enacted/Request FTE	96	-	-
Onboard and Actual FTE; Includes Collections - Reimbursable Resources			
Onboard (Actual/Estimates/Projections)	77	-	-
FTE (Actual/Estimates/Projections)	80	-	-

Office of Health Affairs
Collections - Reimbursable Resources

Collections		FY 2018 Enacted			FY 2019 President's Budget			FY 2020 President's Budget			FY 2019 to FY 2020 Change		
(Dollars in Thousands)		Pos.	FTE	Amount	Pos.	FTE	Amount	Pos.	FTE	Amount	Pos.	FTE	Amount
Department of Defense - Department of Defense	**Source**	-	-	$13	-	-	-	-	-	-	-	-	-
Operations and Support	Location	-	-	$13	-	-	-	-	-	-	-	-	-
Chemical and Biological Readiness	Location	-	-	$13	-	-	-	-	-	-	-	-	-
Department of Defense - Navy, Marine Corps	**Source**	-	-	$74	-	-	-	-	-	-	-	-	-
Operations and Support	Location	-	-	$74	-	-	-	-	-	-	-	-	-
Chemical and Biological Readiness	Location	-	-	$74	-	-	-	-	-	-	-	-	-
Department of Defense - Army	**Source**	-	-	$511	-	-	-	-	-	-	-	-	-
Operations and Support	Location	-	-	$511	-	-	-	-	-	-	-	-	-
Chemical and Biological Readiness	Location	-	-	$511	-	-	-	-	-	-	-	-	-
Department of Homeland Security - Federal Emergency Management Agency	**Source**	-	-	$856	-	-	-	-	-	-	-	-	-
Operations and Support	Location	-	-	$856	-	-	-	-	-	-	-	-	-
Mission Support	Location	-	-	$856	-	-	-	-	-	-	-	-	-
Department of Homeland Security - Transportation Security Administration	**Source**	-	-	$199	-	-	-	-	-	-	-	-	-
Operations and Support	Location	-	-	$199	-	-	-	-	-	-	-	-	-
Mission Support	Location	-	-	$199	-	-	-	-	-	-	-	-	-
Department of Homeland Security - U.S. Immigration and Customs Enforcement	**Source**	-	-	$44,516	-	-	-	-	-	-	-	-	-
Operations and Support	Location	-	-	$44,516	-	-	-	-	-	-	-	-	-
Mission Support	Location	-	-	$44,516	-	-	-	-	-	-	-	-	-
Department of Homeland Security - Citizenship and Immigration Services	**Source**	-	-	$605	-	-	-	-	-	-	-	-	-
Operations and Support	Location	-	-	$605	-	-	-	-	-	-	-	-	-
Mission Support	Location	-	-	$605	-	-	-	-	-	-	-	-	-
Department of Homeland Security - Science and Technology	**Source**	-	-	$35	-	-	-	-	-	-	-	-	-
Operations and Support	Location	-	-	$35	-	-	-	-	-	-	-	-	-

Collections		FY 2018 Enacted			FY 2019 President's Budget			FY 2020 President's Budget			FY 2019 to FY 2020 Change		
(Dollars in Thousands)		Pos.	FTE	Amount	Pos.	FTE	Amount	Pos.	FTE	Amount	Pos.	FTE	Amount
Mission Support	Location	-	-	$35	-	-	-	-	-	-	-	-	-
Department of Homeland Security - Departmental Management and Operations	**Source**	-	-	$201	-	-	-	-	-	-	-	-	-
Operations and Support	Location	-	-	$201	-	-	-	-	-	-	-	-	-
Chemical and Biological Readiness	Location	-	-	$201	-	-	-	-	-	-	-	-	-
Department of Homeland Security - U.S. Customs and Border Protection	**Source**	-	-	$594	-	-	-	-	-	-	-	-	-
Operations and Support	Location	-	-	$594	-	-	-	-	-	-	-	-	-
Mission Support	Location	-	-	$594	-	-	-	-	-	-	-	-	-
Department of Homeland Security - Domestic Nuclear Detection Office	**Source**	-	-	$112	-	-	-	-	-	-	-	-	-
Operations and Support	Location	-	-	$112	-	-	-	-	-	-	-	-	-
Mission Support	Location	-	-	$112	-	-	-	-	-	-	-	-	-
Total Collections		**-**	**-**	**$47,716**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**

Office of Health Affairs
Personnel Compensation and Benefits

Pay Summary

Organization (Dollars in Thousands)	FY 2018 Enacted				FY 2019 President's Budget				FY 2020 President's Budget				FY 2019 to FY 2020 Total			
	Pos.	FTE	Amount	Rate	Pos.	FTE	Amount	Rate	Pos.	FTE	Amount	Rate	Pos.	FTE	Amount	Rate
Operations and Support	103	96	$20,897	$179.09	-	-	-	-	-	-	-	-	-	-	-	-
Total	**103**	**96**	**$20,897**	**$179.09**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Discretionary - Appropriation	103	96	$20,897	$179.09	-	-	-	-	-	-	-	-	-	-	-	-

* The FTE Rate calculation does not include Object Class 11.8-Special Personal Services Payments or 13.0-Benefits for Former Personnel.

Pay by Object Class

Pay Object Classes (Dollars in Thousands)	FY 2018 Enacted	FY 2019 President's Budget	FY 2020 President's Budget	FY 2019 - FY 2020 Change
11.1 Full-time Permanent	$12,933	-	-	-
11.3 Other than Full-Time Permanent	$82	-	-	-
11.5 Other Personnel Compensation	$190	-	-	-
11.8 Special Personal Services Payments	$3,704	-	-	-
12.1 Civilian Personnel Benefits	$3,988	-	-	-
Total - Personnel Compensation and Benefits	**$20,897**	**-**	**-**	**-**
Positions and FTE				
Positions - Civilian	103	-	-	-
FTE - Civilian	96	-	-	-

Office of Health Affairs
Non Pay Budget Exhibits

Non Pay Summary

Organization *(Dollars in Thousands)*	**FY 2018 Enacted**	**FY 2019 President's Budget**	**FY 2020 President's Budget**	**FY 2019 to FY 2020 Total Changes**
Operations and Support	$100,672	-	-	-
Total	**$100,672**	-	-	-
Discretionary - Appropriation	$100,672	-	-	-

Non Pay by Object Class

Non-Pay Object Classes *(Dollars in Thousands)*	**FY 2018 Enacted**	**FY 2019 President's Budget**	**FY 2020 President's Budget**	**FY 2019 to FY 2020 Change**
21.0 Travel and Transportation of Persons	$612	-	-	-
23.1 Rental Payments to GSA	$4,176	-	-	-
24.0 Printing and Reproduction	$4	-	-	-
25.1 Advisory and Assistance Services	$26,541	-	-	-
25.2 Other Services from Non-Federal Sources	$1,601	-	-	-
25.3 Other Goods and Services from Federal Sources	$26,021	-	-	-
25.4 Operation and Maintenance of Facilities	$33	-	-	-
25.7 Operation and Maintenance of Equipment	$4,458	-	-	-
26.0 Supplies and Materials	$12,576	-	-	-
31.0 Equipment	$900	-	-	-
41.0 Grants, Subsidies, and Contributions	$23,750	-	-	-
Total - Non Pay Object Classes	**$100,672**	**-**	**-**	**-**

Office of Health Affairs
Supplemental Budget Justification Exhibits
Working Capital Fund

Appropriation and PPA *(Dollars in Thousands)*	FY 2018 Enacted	FY 2019 President's Budget	FY 2020 President's Budget
Operations and Support	**$7,882**	**-**	**-**
Mission Support	$7,882	-	-
Total Working Capital Fund	**$7,882**	**-**	**-**

Department of Homeland Security

Office of Health Affairs

Operations and Support

Fiscal Year 2020
Congressional Justification

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Operations and Support

Budget Comparison and Adjustments

Comparison of Budget Authority and Request

Organization (Dollars in Thousands)	FY 2018 Enacted			FY 2019 President's Budget			FY 2020 President's Budget			FY 2019 to FY 2020 Total Changes		
	Pos.	FTE	Amount	Pos.	FTE	Amount	Pos.	FTE	Amount	Pos.	FTE	Amount
Mission Support	103	96	$28,419	-	-	-	-	-	-	-	-	-
Chemical and Biological Readiness	-	-	$79,130	-	-	-	-	-	-	-	-	-
Health and Medical Readiness	-	-	$4,620	-	-	-	-	-	-	-	-	-
Integrated Operations	-	-	$9,400	-	-	-	-	-	-	-	-	-
Total	**103**	**96**	**$121,569**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Subtotal Discretionary - Appropriation	103	96	$121,569	-	-	-	-	-	-	-	-	-

With the transfer of its functions to the Countering Weapons of Mass Destruction Office (CWMD) and the Management Directorate's Office of the Chief Human Capital Officer (OCHCO), no funds are included in the FY 2019 President's Budget or FY 2020 President's Budget for the Office of Health Affairs (OHA). Further information on funding for those functions can be found in the FY 2020 President's Budget for CWMD and the Management Directorate.

Operations and Support
Budget Authority and Obligations

Budget Authority *(Dollars in Thousands)*	FY 2018	FY 2019	FY 2020
Enacted/Request	**$121,569**	**-**	**-**
Carryover and/or Recoveries (Actual/Estimates/Projections)	$3,728	-	-
Rescissions to Current Year/Budget Year	-	-	-
Net Sequestered Resources	-	-	-
Reprogrammings/Transfers	$2,025	-	-
Supplementals	-	-	-
Total Budget Authority	**$127,322**	**-**	**-**
Collections – Reimbursable Resources	$47,716	-	-
Total Budget Resources	**$175,038**	**-**	**-**
Obligations (Actual/Estimates/Projections)	$170,229	-	-
Personnel: Positions and FTE			
Enacted/Request Positions	103	-	-
Enacted/Request FTE	96	-	-
Onboard and Actual FTE; Includes Collections - Reimbursable Resources			
Onboard (Actual/Estimates/Projections)	77	-	-
FTE (Actual/Estimates/Projections)	80	-	-

Operations and Support
Collections – Reimbursable Resoucres

Collections		FY 2018 Enacted			FY 2019 President's Budget			FY 2020 President's Budget		
(Dollars in Thousands)		Pos.	FTE	Amount	Pos.	FTE	Amount	Pos.	FTE	Amount
Department of Defense - Department of Defense	**Source**	-	-	$13	-	-	-	-	-	-
Department of Defense - Navy, Marine Corps	**Source**	-	-	$74	-	-	-	-	-	-
Department of Defense - Army	**Source**	-	-	$511	-	-	-	-	-	-
Department of Homeland Security - Federal Emergency Management Agency	**Source**	-	-	$856	-	-	-	-	-	-
Department of Homeland Security - Transportation Security Administration	**Source**	-	-	$199	-	-	-	-	-	-
Department of Homeland Security - U.S. Immigration and Customs Enforcement	**Source**	-	-	$44,516	-	-	-	-	-	-
Department of Homeland Security - Citizenship and Immigration Services	**Source**	-	-	$605	-	-	-	-	-	-
Department of Homeland Security - Science and Technology	**Source**	-	-	$35	-	-	-	-	-	-
Department of Homeland Security - Departmental Management and Operations	**Source**	-	-	$201	-	-	-	-	-	-
Department of Homeland Security - U.S. Customs and Border Protection	**Source**	-	-	$594	-	-	-	-	-	-
Department of Homeland Security - Domestic Nuclear Detection Office	**Source**	-	-	$112	-	-	-	-	-	-
Total Collections		-	-	**$47,716**	-	-	-	-	-	-

Operations and Support
Summary of Budget Changes

Budget Formulation Activity *(Dollars in Thousands)*	Positions	FTE	Amount
FY 2018 Enacted	**103**	**96**	**$121,569**
FY 2019 President's Budget	**-**	**-**	**-**
FY 2020 Base Budget	**-**	**-**	**-**
FY 2020 Request	**-**	**-**	**-**
FY 2019 To FY 2020 Change	**-**	**-**	**-**

Operations and Support
Personnel Compensation and Benefits

Pay Summary

Organization (Dollars in Thousands)	FY 2018 Enacted				FY 2019 President's Budget				FY 2020 President's Budget				FY 2019 to FY 2020 Total			
	Pos.	FTE	Amount	Rate	Pos.	FTE	Amount	Rate	Pos.	FTE	Amount	Rate	Pos.	FTE	Amount	Rate
Mission Support	103	96	$18,333	$179.09	-	-	-	-	-	-	-	-	-	-	-	-
Chemical and Biological Readiness	-	-	$1,129	-	-	-	-	-	-	-	-	-	-	-	-	-
Health and Medical Readiness	-	-	$527	-	-	-	-	-	-	-	-	-	-	-	-	-
Integrated Operations	-	-	$908	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	**103**	**96**	**$20,897**	**$179.09**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Discretionary - Appropriation	103	96	$20,897	$179.09	-	-	-	-	-	-	-	-	-	-	-	-

Pay by Object Class

Pay Object Classes (Dollars in Thousands)	FY 2018 Enacted	FY 2019 President's Budget	FY 2020 President's Budget	FY 2019 - FY 2020 Change
11.1 Full-time Permanent	$12,933	-	-	-
11.3 Other than Full-Time Permanent	$82	-	-	-
11.5 Other Personnel Compensation	$190	-	-	-
11.8 Special Personal Services Payments	$3,704	-	-	-
12.1 Civilian Personnel Benefits	$3,988	-	-	-
Total - Personnel Compensation and Benefits	**$20,897**	**-**	**-**	**-**
Positions and FTE				
Positions - Civilian	103	-	-	-
FTE - Civilian	96	-	-	-

Operations and Support
Permanent Positions by Grade – Appropriation

Grades and Salary Range *(Dollars in Thousands)*	FY 2018 Enacted	FY 2019 President's Budget	FY 2020 President's Budget	FY 2019 to FY 2020 Change
Total, SES	12	-	-	-
GS-15	29	-	-	-
GS-14	25	-	-	-
GS-13	17	-	-	-
GS-12	5	-	-	-
GS-11	6	-	-	-
GS-9	2	-	-	-
Other Graded Positions	7	-	-	-
Total Permanent Positions	**103**	**-**	**-**	**-**
Unfilled Positions EOY	26	-	-	-
Total Perm. Employment (Filled Positions) EOY	77	-	-	-
Position Locations				
Headquarters	103	-	-	-
Averages				
Average Personnel Costs, ES Positions	175,698	-	-	-
Average Personnel Costs, GS Positions	121,384	-	-	-
Average Grade, GS Positions	14	-	-	-

[1]Total SES includes Senior Executive Service (ES), Executive Schedule (EX), Senior Level Positions (SL) and Scientific and Professional Positions (ST). Other Graded Positions include the GP positions which include Physicians covered by the General Schedule classification system and GS base pay ranges who receive title 38 market pay instead of locality pay.

Operations and Support
Non Pay Budget Exhibits

Non Pay Summary

Organization *(Dollars in Thousands)*	FY 2018 Enacted	FY 2019 President's Budget	FY 2020 President's Budget	FY 2019 to FY 2020 Total Changes
Mission Support	$10,086	-	-	-
Chemical and Biological Readiness	$78,001	-	-	-
Health and Medical Readiness	$4,093	-	-	-
Integrated Operations	$8,492	-	-	-
Total	**$100,672**	-	-	-
Discretionary - Appropriation	$100,672	-	-	-

Non Pay by Object Class

Non-Pay Object Classes *(Dollars in Thousands)*	FY 2018 Enacted	FY 2019 President's Budget	FY 2020 President's Budget	FY 2019 to FY 2020 Change
21.0 Travel and Transportation of Persons	$612	-	-	-
23.1 Rental Payments to GSA	$4,176	-	-	-
24.0 Printing and Reproduction	$4	-	-	-
25.1 Advisory and Assistance Services	$26,541	-	-	-
25.2 Other Services from Non-Federal Sources	$1,601	-	-	-
25.3 Other Goods and Services from Federal Sources	$26,021	-	-	-
25.4 Operation and Maintenance of Facilities	$33	-	-	-
25.7 Operation and Maintenance of Equipment	$4,458	-	-	-
26.0 Supplies and Materials	$12,576	-	-	-
31.0 Equipment	$900	-	-	-
41.0 Grants, Subsidies, and Contributions	$23,750	-	-	-
Total - Non Pay Object Classes	**$100,672**	-	-	-

Mission Support – PPA

Budget Comparison and Adjustments

Comparison of Budget Authority and Request

Organization (Dollars in Thousands)	FY 2018 Enacted			FY 2019 President's Budget			FY 2020 President's Budget			FY 2019 to FY 2020 Total Changes		
	Pos.	FTE	Amount	Pos.	FTE	Amount	Pos.	FTE	Amount	Pos.	FTE	Amount
Mission Support	103	96	$28,419	-	-	-	-	-	-	-	-	-
Total	**103**	**96**	**$28,419**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Subtotal Discretionary - Appropriation	103	96	$28,419	-	-	-	-	-	-	-	-	-

PPA Level I Description

With the transfer of its functions to CWMD and OCHCO, no funds are included in the FY 2019 President's Budget or FY 2020 President's Budget for OHA. Further information on funding for those functions can be found in the FY 2020 President's Budget for CWMD and the Management Directorate.

Mission Support – PPA
Budget Authority and Obligations

Budget Authority *(Dollars in Thousands)*	FY 2018	FY 2019	FY 2020
Enacted/Request	**$28,419**	**-**	**-**
Carryover and/or Recoveries (Actual/Estimates/Projections)	-	-	-
Rescissions to Current Year/Budget Year	-	-	-
Net Sequestered Resources	-	-	-
Reprogrammings/Transfers	($1,500)	-	-
Supplementals	-	-	-
Total Budget Authority	**$26,919**	**-**	**-**
Collections – Reimbursable Resources	$46,917	-	-
Total Budget Resources	**$73,836**	**-**	**-**
Obligations (Actual/Estimates/Projections)	$73,495	-	-
Personnel: Positions and FTE			
Enacted/Request Positions	103	-	-
Enacted/Request FTE	96	-	-
Onboard and Actual FTE; Includes Collections - Reimbursable Resources			
Onboard (Actual/Estimates/Projections)	77	-	-
FTE (Actual/Estimates/Projections)	80	-	-

Mission Support – PPA
Collections – Reimbursable Resources

Collections		FY 2018 Enacted			FY 2019 President's Budget			FY 2020 President's Budget		
(Dollars in Thousands)		Pos.	FTE	Amount	Pos.	FTE	Amount	Pos.	FTE	Amount
Department of Homeland Security - Federal Emergency Management Agency	**Source**	-	-	$856	-	-	-	-	-	-
Department of Homeland Security - Transportation Security Administration	**Source**	-	-	$199	-	-	-	-	-	-
Department of Homeland Security - U.S. Immigration and Customs Enforcement	**Source**	-	-	$44,516	-	-	-	-	-	-
Department of Homeland Security - Citizenship and Immigration Services	**Source**	-	-	$605	-	-	-	-	-	-
Department of Homeland Security - Science and Technology	**Source**	-	-	$35	-	-	-	-	-	-
Department of Homeland Security - U.S. Customs and Border Protection	**Source**	-	-	$594	-	-	-	-	-	-
Department of Homeland Security - Domestic Nuclear Detection Office	**Source**	-	-	$112	-	-	-	-	-	-
Total Collections		-	-	**$46,917**	-	-	-	-	-	-

Mission Support – PPA
Summary of Budget Changes

Budget Formulation Activity *(Dollars in Thousands)*	Positions	FTE	Amount
FY 2018 Enacted	**103**	**96**	**$28,419**
FY 2019 President's Budget	**-**	**-**	**-**
FY 2020 Base Budget	**-**	**-**	**-**
FY 2020 Request	**-**	**-**	**-**
FY 2019 To FY 2020 Change	**-**	**-**	**-**

Mission Support – PPA
Personnel Compensation and Benefits
Pay Summary

Organization (Dollars in Thousands)	FY 2018 Enacted				FY 2019 President's Budget				FY 2020 President's Budget				FY 2019 to FY 2020 Total			
	Pos.	FTE	Amount	Rate	Pos.	FTE	Amount	Rate	Pos.	FTE	Amount	Rate	Pos.	FTE	Amount	Rate
Mission Support	103	96	$18,333	$179.09	-	-	-	-	-	-	-	-	-	-	-	-
Total	**103**	**96**	**$18,333**	**$179.09**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Discretionary - Appropriation	103	96	$18,333	$179.09	-	-	-	-	-	-	-	-	-	-	-	-

Pay by Object Class

Pay Object Classes (Dollars in Thousands)	FY 2018 Enacted	FY 2019 President's Budget	FY 2020 President's Budget	FY 2019 - FY 2020 Change
11.1 Full-time Permanent	$12,933	-	-	-
11.3 Other than Full-Time Permanent	$82	-	-	-
11.5 Other Personnel Compensation	$190	-	-	-
11.8 Special Personal Services Payments	$1,140	-	-	-
12.1 Civilian Personnel Benefits	$3,988	-	-	-
Total - Personnel Compensation and Benefits	**$18,333**	**-**	**-**	**-**
Positions and FTE				
Positions - Civilian	103	-	-	-
FTE - Civilian	96	-	-	-

Mission Support PPA
Non Pay Budget Exhibits
Non Pay Summary

Organization *(Dollars in Thousands)*	**FY 2018 Enacted**	**FY 2019 President's Budget**	**FY 2020 President's Budget**	**FY 2019 to FY 2020 Total Changes**
Mission Support	$10,086	-	-	-
Total	**$10,086**	-	-	-
Discretionary - Appropriation	$10,086	-	-	-

Non Pay by Object Class

Non-Pay Object Classes *(Dollars in Thousands)*	**FY 2018 Enacted**	**FY 2019 President's Budget**	**FY 2020 President's Budget**	**FY 2019 to FY 2020 Change**
21.0 Travel and Transportation of Persons	$98	-	-	-
23.1 Rental Payments to GSA	$4,176	-	-	-
24.0 Printing and Reproduction	$4	-	-	-
25.1 Advisory and Assistance Services	$1,170	-	-	-
25.2 Other Services from Non-Federal Sources	$324	-	-	-
25.3 Other Goods and Services from Federal Sources	$832	-	-	-
25.4 Operation and Maintenance of Facilities	$25	-	-	-
25.7 Operation and Maintenance of Equipment	$3,360	-	-	-
26.0 Supplies and Materials	$97	-	-	-
Total - Non Pay Object Classes	**$10,086**	**-**	**-**	**-**

Chemical and Biological Readiness – PPA

Budget Comparison and Adjustments

Comparison of Budget Authority and Request

Organization (Dollars in Thousands)	FY 2018 Enacted			FY 2019 President's Budget			FY 2020 President's Budget			FY 2019 to FY 2020 Total Changes		
	Pos.	FTE	Amount	Pos.	FTE	Amount	Pos.	FTE	Amount	Pos.	FTE	Amount
Chemical and Biological Readiness	-	-	$79,130	-	-	-	-	-	-	-	-	-
Total	**-**	**-**	**$79,130**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Subtotal Discretionary - Appropriation	-	-	$79,130	-	-	-	-	-	-	-	-	-

PPA Level I Description

With the transfer of its functions, no funds are included in the FY 2019 President's Budget or FY 2020 President's Budget for OHA. Further information on funding for functions previously funded through the Chemical and Biological Readiness PPA can be found in the FY 2020 President's Budget for CWMD.

Chemical and Biological Readiness – PPA
Budget Authority and Obligations

Budget Authority *(Dollars in Thousands)*	**FY 2018**	**FY 2019**	**FY 2020**
Enacted/Request	**$79,130**	**-**	**-**
Carryover and/or Recoveries (Actual/Estimates/Projections)	-	-	-
Rescissions to Current Year/Budget Year	-	-	-
Net Sequestered Resources	-	-	-
Reprogrammings/Transfers	$3,860	-	-
Supplementals	-	-	-
Total Budget Authority	**$82,990**	**-**	**-**
Collections – Reimbursable Resources	$799	-	-
Total Budget Resources	**$83,789**	**-**	**-**
Obligations (Actual/Estimates/Projections)	$83,167	-	-
Personnel: Positions and FTE			
Enacted/Request Positions	-	-	-
Enacted/Request FTE	-	-	-
Onboard and Actual FTE; Includes Collections - Reimbursable Resources			
Onboard (Actual/Estimates/Projections)	-	-	-
FTE (Actual/Estimates/Projections)	-	-	-

Chemical and Biological Readiness – PPA
Collections – Reimbursable Resources

Collections		FY 2018 Enacted			FY 2019 President's Budget			FY 2020 President's Budget		
(Dollars in Thousands)		Pos.	FTE	Amount	Pos.	FTE	Amount	Pos.	FTE	Amount
Department of Defense - Department of Defense	**Source**	-	-	$13	-	-	-	-	-	-
Department of Defense - Navy, Marine Corps	**Source**	-	-	$74	-	-	-	-	-	-
Department of Defense - Army	**Source**	-	-	$511	-	-	-	-	-	-
Department of Homeland Security - Departmental Management and Operations	**Source**	-	-	$201	-	-	-	-	-	-
Total Collections		-	-	**$799**	-	-	-	-	-	-

Chemical and Biological Readiness – PPA
Summary of Budget Changes

Budget Formulation Activity *(Dollars in Thousands)*	Positions	FTE	Amount
FY 2018 Enacted	-	-	**$79,130**
FY 2019 President's Budget	-	-	-
FY 2020 Base Budget	-	-	-
FY 2020 Request	-	-	-
FY 2019 To FY 2020 Change	-	-	-

Chemical and Biological Readiness – PPA
Personnel Compensation and Benefits

Pay Summary

Organization (Dollars in Thousands)	FY 2018 Enacted				FY 2019 President's Budget				FY 2020 President's Budget				FY 2019 to FY 2020 Total			
	Pos.	FTE	Amount	Rate	Pos.	FTE	Amount	Rate	Pos.	FTE	Amount	Rate	Pos.	FTE	Amount	Rate
Chemical and Biological Readiness	-	-	$1,129	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	**-**	**-**	**$1,129**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Discretionary - Appropriation	-	-	$1,129	-	-	-	-	-	-	-	-	-	-	-	-	-

Pay by Object Class

Pay Object Classes (Dollars in Thousands)	FY 2018 Enacted	FY 2019 President's Budget	FY 2020 President's Budget	FY 2019 - FY 2020 Change
11.8 Special Personal Services Payments	$1,129	-	-	-
Total - Personnel Compensation and Benefits	**$1,129**	**-**	**-**	**-**
Positions and FTE				

Chemical and Biological Readiness – PPA
Non Pay Budget Exhibits

Non Pay Summary

Organization *(Dollars in Thousands)*	**FY 2018 Enacted**	**FY 2019 President's Budget**	**FY 2020 President's Budget**	**FY 2019 to FY 2020 Total Changes**
Chemical and Biological Readiness	$78,001	-	-	-
Total	**$78,001**	-	-	-
Discretionary - Appropriation	$78,001	-	-	-

Non Pay by Object Class

Non-Pay Object Classes *(Dollars in Thousands)*	**FY 2018 Enacted**	**FY 2019 President's Budget**	**FY 2020 President's Budget**	**FY 2019 to FY 2020 Change**
21.0 Travel and Transportation of Persons	$249	-	-	-
25.1 Advisory and Assistance Services	$20,422	-	-	-
25.2 Other Services from Non-Federal Sources	$475	-	-	-
25.3 Other Goods and Services from Federal Sources	$21,115	-	-	-
26.0 Supplies and Materials	$11,890	-	-	-
31.0 Equipment	$900	-	-	-
41.0 Grants, Subsidies, and Contributions	$22,950	-	-	-
Total - Non Pay Object Classes	**$78,001**	**-**	**-**	**-**

Health and Medical Readiness – PPA

Budget Comparison and Adjustments

Comparison of Budget Authority and Request

Organization (Dollars in Thousands)	FY 2018 Enacted			FY 2019 President's Budget			FY 2020 President's Budget			FY 2019 to FY 2020 Total Changes		
	Pos.	FTE	Amount	Pos.	FTE	Amount	Pos.	FTE	Amount	Pos.	FTE	Amount
Health and Medical Readiness	-	-	$4,620	-	-	-	-	-	-	-	-	-
Total	**-**	**-**	**$4,620**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Subtotal Discretionary - Appropriation	-	-	$4,620	-	-	-	-	-	-	-	-	-

PPA Level I Description

As a of result of the establishment of the Countering Weapons of Mass Destruction Office (CWMD), funds for Office of Health Affairs legacy functions are being requested in CWMD and the Management Directorate's Office of the Chief Human Capital Officer (OCHCO) in FY 2019 and FY 2020.

CWMD will maintain the authorities and resources to coordinate with the medical first responder community and stakeholders at all levels of government to prepare for, respond to, and recover from mass casualty incidents and health consequences of terrorism and disasters. CWMD will provide oversight for DHS operational Emergency Medical Services (EMS) activities, including emergency care services provided for people in DHS care and custody and will provide DHS radiation health and safety expertise in support of headquarters and component radiation safety programs.

OCHCO will be responsible for workforce-focused health and medical activities of the Department.

Health and Medical Readiness – PPA
Budget Authority and Obligations

Budget Authority *(Dollars in Thousands)*	FY 2018	FY 2019	FY 2020
Enacted/Request	**$4,620**	**-**	**-**
Carryover and/or Recoveries (Actual/Estimates/Projections)	$816	-	-
Rescissions to Current Year/Budget Year	-	-	-
Net Sequestered Resources	-	-	-
Reprogrammings/Transfers	$22	-	-
Supplementals	-	-	-
Total Budget Authority	**$5,458**	**-**	**-**
Collections – Reimbursable Resources	-	-	-
Total Budget Resources	**$5,458**	**-**	**-**
Obligations (Actual/Estimates/Projections)	$5,354	-	-
Personnel: Positions and FTE			
Enacted/Request Positions	-	-	-
Enacted/Request FTE	-	-	-
Onboard and Actual FTE; Includes Collections - Reimbursable Resources			
Onboard (Actual/Estimates/Projections)	-	-	-
FTE (Actual/Estimates/Projections)	-	-	-

Health and Medical Readiness – PPA
Summary of Budget Changes

Budget Formulation Activity *(Dollars in Thousands)*	Positions	FTE	Amount
FY 2018 Enacted	-	-	**$4,620**
FY 2019 President's Budget	-	-	-
FY 2020 Base Budget	-	-	-
FY 2020 Request	-	-	-
FY 2019 To FY 2020 Change	-	-	-

Health and Medical Readiness – PPA
Personnel Compensation and Benefits

Pay Summary

Organization (Dollars in Thousands)	FY 2018 Enacted				FY 2019 President's Budget				FY 2020 President's Budget				FY 2019 to FY 2020 Total			
	Pos.	FTE	Amount	Rate	Pos.	FTE	Amount	Rate	Pos.	FTE	Amount	Rate	Pos.	FTE	Amount	Rate
Health and Medical Readiness	-	-	$527	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	**-**	**-**	**$527**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Discretionary - Appropriation	-	-	$527	-	-	-	-	-	-	-	-	-	-	-	-	-

Pay by Object Class

Pay Object Classes (Dollars in Thousands)	FY 2018 Enacted	FY 2019 President's Budget	FY 2020 President's Budget	FY 2019 - FY 2020 Change
11.8 Special Personal Services Payments	$527	-	-	-
Total - Personnel Compensation and Benefits	**$527**	**-**	**-**	**-**
Positions and FTE				

Health and Medical Readiness – PPA
Non Pay Budget Exhibits

Non Pay Summary

Organization *(Dollars in Thousands)*	FY 2018 Enacted	FY 2019 President's Budget	FY 2020 President's Budget	FY 2019 to FY 2020 Total Changes
Health and Medical Readiness	$4,093	-	-	-
Total	**$4,093**	-	-	-
Discretionary - Appropriation	$4,093	-	-	-

Non Pay by Object Class

Non-Pay Object Classes *(Dollars in Thousands)*	FY 2018 Enacted	FY 2019 President's Budget	FY 2020 President's Budget	FY 2019 to FY 2020 Change
21.0 Travel and Transportation of Persons	$137	-	-	-
25.1 Advisory and Assistance Services	$1,143	-	-	-
25.2 Other Services from Non-Federal Sources	$737	-	-	-
25.3 Other Goods and Services from Federal Sources	$1,337	-	-	-
25.7 Operation and Maintenance of Equipment	$150	-	-	-
26.0 Supplies and Materials	$589	-	-	-
Total - Non Pay Object Classes	**$4,093**	**-**	**-**	**-**

Integrated Operations – PPA

Budget Comparison and Adjustments

Comparison of Budget Authority and Request

Organization (Dollars in Thousands)	FY 2018 Enacted			FY 2019 President's Budget			FY 2020 President's Budget			FY 2019 to FY 2020 Total Changes		
	Pos.	FTE	Amount	Pos.	FTE	Amount	Pos.	FTE	Amount	Pos.	FTE	Amount
Integrated Operations	-	-	$9,400	-	-	-	-	-	-	-	-	-
Total	**-**	**-**	**$9,400**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Subtotal Discretionary - Appropriation	-	-	$9,400	-	-	-	-	-	-	-	-	-

PPA Level I Description

With the transfer of its functions, no funds are included in the FY 2019 President's Budget or FY 2020 President's Budget for OHA. Further information on funding for those functions previously funded through the Integrated Operations PPA can be found in the FY 2020 President's Budget for CWMD.

Integrated Operations – PPA
Budget Authority and Obligations

Budget Authority *(Dollars in Thousands)*	FY 2018	FY 2019	FY 2020
Enacted/Request	**$9,400**	**-**	**-**
Carryover and/or Recoveries (Actual/Estimates/Projections)	$2,912	-	-
Rescissions to Current Year/Budget Year	-	-	-
Net Sequestered Resources	-	-	-
Reprogrammings/Transfers	($357)	-	-
Supplementals	-	-	-
Total Budget Authority	**$11,955**	**-**	**-**
Collections – Reimbursable Resources	-	-	-
Total Budget Resources	**$11,955**	**-**	**-**
Obligations (Actual/Estimates/Projections)	$8,213	-	-
Personnel: Positions and FTE			
Enacted/Request Positions	-	-	-
Enacted/Request FTE	-	-	-
Onboard and Actual FTE; Includes Collections - Reimbursable Resources			
Onboard (Actual/Estimates/Projections)	-	-	-
FTE (Actual/Estimates/Projections)	-	-	-

Integrated Operations – PPA
Summary of Budget Changes

Budget Formulation Activity *(Dollars in Thousands)*	Positions	FTE	Amount
FY 2018 Enacted	-	-	**$9,400**
FY 2019 President's Budget	-	-	-
FY 2020 Base Budget	-	-	-
FY 2020 Request	-	-	-
FY 2019 To FY 2020 Change	-	-	-

Integrated Operations – PPA
Personnel Compensation and Benefits

Pay Summary

Organization (Dollars in Thousands)	FY 2018 Enacted				FY 2019 President's Budget				FY 2020 President's Budget				FY 2019 to FY 2020 Total			
	Pos.	FTE	Amount	Rate	Pos.	FTE	Amount	Rate	Pos.	FTE	Amount	Rate	Pos.	FTE	Amount	Rate
Integrated Operations	-	-	$908	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	**-**	**-**	**$908**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Discretionary - Appropriation	-	-	$908	-	-	-	-	-	-	-	-	-	-	-	-	-

Pay by Object Class

Pay Object Classes (Dollars in Thousands)	FY 2018 Enacted	FY 2019 President's Budget	FY 2020 President's Budget	FY 2019 - FY 2020 Change
11.8 Special Personal Services Payments	$908	-	-	-
Total - Personnel Compensation and Benefits	**$908**	**-**	**-**	**-**
Positions and FTE				

Integrated Operations – PPA
Non Pay Budget Exhibits

Non Pay Summary

Organization *(Dollars in Thousands)*	**FY 2018 Enacted**	**FY 2019 President's Budget**	**FY 2020 President's Budget**	**FY 2019 to FY 2020 Total Changes**
Integrated Operations	$8,492	-	-	-
Total	**$8,492**	-	-	-
Discretionary - Appropriation	$8,492	-	-	-

Non Pay by Object Class

Non-Pay Object Classes *(Dollars in Thousands)*	**FY 2018 Enacted**	**FY 2019 President's Budget**	**FY 2020 President's Budget**	**FY 2019 to FY 2020 Change**
21.0 Travel and Transportation of Persons	$128	-	-	-
25.1 Advisory and Assistance Services	$3,806	-	-	-
25.2 Other Services from Non-Federal Sources	$65	-	-	-
25.3 Other Goods and Services from Federal Sources	$2,737	-	-	-
25.4 Operation and Maintenance of Facilities	$8	-	-	-
25.7 Operation and Maintenance of Equipment	$948	-	-	-
41.0 Grants, Subsidies, and Contributions	$800	-	-	-
Total - Non Pay Object Classes	**$8,492**	**-**	**-**	**-**

Department of Homeland Security

Domestic Nuclear Detection Office

Budget Overview

Fiscal Year 2020

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Domestic Nuclear Detection Office

Appropriation Organization Structure

Organization Name	Level	Fund Type (* Includes Defense Funding)
Domestic Nuclear Detection Office	**Component**	
Operations and Support	**Appropriation**	
Mission Support	PPA	Discretionary - Appropriation
Procurement, Construction, and Improvements	**Appropriation**	
Large Scale Detection Systems	Investment,PPA	Discretionary - Appropriation
Human Portable Rad/Nuc Systems	PPA,Investment	Discretionary - Appropriation
Research and Development	**Appropriation**	
Architecture Planning and Analysis	PPA	Discretionary - Appropriation
Transformational Research and Development	PPA	Discretionary - Appropriation
Detection Capability Development	PPA	Discretionary - Appropriation
Detection Capability Assessments	PPA	Discretionary - Appropriation
Nuclear Forensics	PPA	Discretionary - Appropriation
Federal Assistance	**Appropriation**	
Federal, State, Local, Territorial, and Tribal Support	PPA	Discretionary - Appropriation
Securing the Cities	PPA	Discretionary - Appropriation

Domestic Nuclear Detection Office
Strategic Context

Component Overview

With the transfer of its functions to the Countering Weapons of Mass Destruction Office (CWMD), no funds are included in the Fiscal Year (FY) 2019 President's Budget or the FY 2020 President's Budget for the Domestic Nuclear Detection Office. Further information on funding for those functions can be found in the FY 2020 President's Budget for CWMD.

Domestic Nuclear Detection Office
Budget Comparison and Adjustments

Budget Comparison with FY 2019 Annualized CR

Organization *(Dollars in Thousands)*	FY 2018 Enacted	FY 2019 Annualized CR	FY 2019 President's Budget	FY 2020 President's Budget
Operations and Support	**$54,664**	**$54,664**	**-**	**-**
Mission Support	$54,664	$54,664	-	-
Procurement, Construction, and Improvements	**$89,096**	**$89,096**	**-**	**-**
Large Scale Detection Systems	$64,524	$64,524	-	-
Human Portable Rad/Nuc Systems	$24,572	$24,572	-	-
Research and Development	**$145,661**	**$145,661**	**-**	**-**
Architecture Planning and Analysis	$15,937	$15,937	-	-
Transformational Research and Development	$62,081	$62,081	-	-
Detection Capability Development	$15,155	$15,155	-	-
Detection Capability Assessments	$34,127	$34,127	-	-
Nuclear Forensics	$18,361	$18,361	-	-
Federal Assistance	**$46,019**	**$46,019**	**-**	**-**
Federal, State, Local, Territorial, and Tribal Support	$24,884	$24,884	-	-
Securing the Cities	$21,135	$21,135	-	-
Total	**$335,440**	**$335,440**	**-**	**-**

Domestic Nuclear Detection Office
Comparison of Budget Authority and Request

Organization (Dollars in Thousands)	FY 2018 Enacted			FY 2019 President's Budget			FY 2020 President's Budget			FY 2019 to FY 2020 Total Changes		
	Pos.	FTE	Amount	Pos.	FTE	Amount	Pos.	FTE	Amount	Pos.	FTE	Amount
Operations and Support	158	144	$54,664	-	-	-	-	-	-	-	-	-
Procurement, Construction, and Improvements	-	-	$89,096	-	-	-	-	-	-	-	-	-
Research and Development	-	-	$145,661	-	-	-	-	-	-	-	-	-
Federal Assistance	-	-	$46,019	-	-	-	-	-	-	-	-	-
Total	**158**	**144**	**$335,440**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Subtotal Discretionary - Appropriation	158	144	$335,440	-	-	-	-	-	-	-	-	-

Component Budget Overview

With the transfer of its functions to the Countering Weapons of Mass Destruction Office (CWMD), no funds are included in the Fiscal Year (FY) 2019 President's Budget or the FY 2020 President's Budget for the Domestic Nuclear Detection Office. Further information on funding for those functions can be found in the FY 2020 President's Budget for CWMD.

Domestic Nuclear Detection Office
Budget Authority and Obligations

Budget Authority *(Dollars in Thousands)*	**FY 2018**	**FY 2019**	**FY 2020**
Enacted/Request	**$335,440**	**-**	**-**
Carryover and/or Recoveries (Actual/Estimates/Projections)	$66,639	-	-
Rescissions to Current Year/Budget Year	-	-	-
Net Sequestered Resources	-	-	-
Reprogrammings/Transfers	($4,025)	-	-
Supplementals	-	-	-
Total Budget Authority	**$398,054**	**-**	**-**
Collections – Reimbursable Resources	$4,827	-	-
Total Budget Resources	**$402,881**	**-**	**-**
Obligations (Actual/Estimates/Projections)	$250,590	-	-
Personnel: Positions and FTE			
Enacted/Request Positions	158	-	-
Enacted/Request FTE	144	-	-
Onboard and Actual FTE; Includes Collections - Reimbursable Resources			
Onboard (Actual/Estimates/Projections)	138	-	-
FTE (Actual/Estimates/Projections)	137	-	-

Domestic Nuclear Detection Office
Collections - Reimbursable Resources

Collections		FY 2018 Enacted			FY 2019 President's Budget			FY 2020 President's Budget			FY 2019 to FY 2020 Change		
(Dollars in Thousands)		Pos.	FTE	Amount	Pos.	FTE	Amount	Pos.	FTE	Amount	Pos.	FTE	Amount
Department of Homeland Security - Federal Emergency Management Agency	**Source**	-	-	$100	-	-	-	-	-	-	-	-	-
Operations and Support	Location	-	-	$100	-	-	-	-	-	-	-	-	-
Mission Support	Location	-	-	$100	-	-	-	-	-	-	-	-	-
Department of Homeland Security - Transportation Security Administration	**Source**	-	-	$100	-	-	-	-	-	-	-	-	-
Federal Assistance	Location	-	-	$100	-	-	-	-	-	-	-	-	-
Federal, State, Local, Territorial, and Tribal Support	Location	-	-	$100	-	-	-	-	-	-	-	-	-
Department of Homeland Security - Science and Technology	**Source**	-	-	$795	-	-	-	-	-	-	-	-	-
Research and Development	Location	-	-	$795	-	-	-	-	-	-	-	-	-
Transformational Research and Development	Location	-	-	$795	-	-	-	-	-	-	-	-	-
Independent Agency - Postal Service	**Source**	-	-	$5	-	-	-	-	-	-	-	-	-
Procurement, Construction, and Improvements	Location	-	-	$5	-	-	-	-	-	-	-	-	-
Large Scale Detection Systems	Location	-	-	$5	-	-	-	-	-	-	-	-	-
Department of Homeland Security - Office of Health Affairs	**Source**	-	-	$2,198	-	-	-	-	-	-	-	-	-
Operations and Support	Location	-	-	$2,075	-	-	-	-	-	-	-	-	-
Mission Support	Location	-	-	$2,075	-	-	-	-	-	-	-	-	-
Research and Development	Location	-	-	$123	-	-	-	-	-	-	-	-	-
Architecture Planning and Analysis	Location	-	-	$122	-	-	-	-	-	-	-	-	-
Detection Capability Development	Location	-	-	$1	-	-	-	-	-	-	-	-	-
Office of the Director of National Intelligence	**Source**	-	-	$176	-	-	-	-	-	-	-	-	-
Operations and Support	Location	-	-	$176	-	-	-	-	-	-	-	-	-
Mission Support	Location	-	-	$176	-	-	-	-	-	-	-	-	-
Department of Homeland Security - Immediate Office of the Secretary	**Source**	-	-	$1,453	-	-	-	-	-	-	-	-	-
Operations and Support	Location	-	-	$1,453	-	-	-	-	-	-	-	-	-

Collections		FY 2018 Enacted			FY 2019 President's Budget			FY 2020 President's Budget			FY 2019 to FY 2020 Change		
(Dollars in Thousands)		Pos.	FTE	Amount	Pos.	FTE	Amount	Pos.	FTE	Amount	Pos.	FTE	Amount
Mission Support	Location	-	-	$1,453	-	-	-	-	-	-	-	-	-
Total Collections		-	-	**$4,827**	-	-	-	-	-	-	-	-	-

Domestic Nuclear Detection Office
Personnel Compensation and Benefits

Pay Summary

Organization (Dollars in Thousands)	FY 2018 Enacted				FY 2019 President's Budget				FY 2020 President's Budget				FY 2019 to FY 2020 Total			
	Pos.	FTE	Amount	Rate	Pos.	FTE	Amount	Rate	Pos.	FTE	Amount	Rate	Pos.	FTE	Amount	Rate
Operations and Support	158	144	$28,329	$174.51	-	-	-	-	-	-	-	-	-	-	-	-
Total	**158**	**144**	**$28,329**	**$174.51**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Discretionary - Appropriation	158	144	$28,329	$174.51	-	-	-	-	-	-	-	-	-	-	-	-

Pay by Object Class

Pay Object Classes (Dollars in Thousands)	FY 2018 Enacted	FY 2019 President's Budget	FY 2020 President's Budget	FY 2019 - FY 2020 Change
11.1 Full-time Permanent	$19,090	-	-	-
11.5 Other Personnel Compensation	$250	-	-	-
11.8 Special Personal Services Payments	$3,200	-	-	-
12.1 Civilian Personnel Benefits	$5,789	-	-	-
Total - Personnel Compensation and Benefits	**$28,329**	**-**	**-**	**-**
Positions and FTE				
Positions - Civilian	158	-	-	-
FTE - Civilian	144	-	-	-

Domestic Nuclear Detection Office
Non Pay Budget Exhibits

Non Pay Summary

Organization *(Dollars in Thousands)*	FY 2018 Enacted	FY 2019 President's Budget	FY 2020 President's Budget	FY 2019 to FY 2020 Total Changes
Operations and Support	$26,335	-	-	-
Procurement, Construction, and Improvements	$89,096	-	-	-
Research and Development	$145,661	-	-	-
Federal Assistance	$46,019	-	-	-
Total	**$307,111**	-	-	-
Discretionary - Appropriation	$307,111	-	-	-

Non Pay by Object Class

Non-Pay Object Classes *(Dollars in Thousands)*	FY 2018 Enacted	FY 2019 President's Budget	FY 2020 President's Budget	FY 2019 to FY 2020 Change
21.0 Travel and Transportation of Persons	$1,351	-	-	-
23.1 Rental Payments to GSA	$5,875	-	-	-
24.0 Printing and Reproduction	$23	-	-	-
25.1 Advisory and Assistance Services	$67,733	-	-	-
25.2 Other Services from Non-Federal Sources	$855	-	-	-
25.3 Other Goods and Services from Federal Sources	$75,313	-	-	-
25.5 Research and Development Contracts	$49,889	-	-	-
25.7 Operation and Maintenance of Equipment	$370	-	-	-
26.0 Supplies and Materials	$157	-	-	-
31.0 Equipment	$75,755	-	-	-
41.0 Grants, Subsidies, and Contributions	$29,790	-	-	-
Total - Non Pay Object Classes	**$307,111**	-	-	-

Domestic Nuclear Detection Office
Supplemental Budget Justification Exhibits
Working Capital Fund

Appropriation and PPA *(Dollars in Thousands)*	FY 2018 Enacted	FY 2019 President's Budget	FY 2020 President's Budget
Operations and Support	**$10,895**	**-**	**-**
Mission Support	$10,895	-	-
Total Working Capital Fund	**$10,895**	**-**	**-**

Department of Homeland Security

Domestic Nuclear Detection Office

Operations and Support

Fiscal Year 2020
Congressional Justification

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Operations and Support

Budget Comparison and Adjustments

Comparison of Budget Authority and Request

Organization (Dollars in Thousands)	FY 2018 Enacted			FY 2019 President's Budget			FY 2020 President's Budget			FY 2019 to FY 2020 Total Changes		
	Pos.	FTE	Amount	Pos.	FTE	Amount	Pos.	FTE	Amount	Pos.	FTE	Amount
Mission Support	158	144	$54,664	-	-	-	-	-	-	-	-	-
Total	**158**	**144**	**$54,664**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Subtotal Discretionary - Appropriation	158	144	$54,664	-	-	-	-	-	-	-	-	-

With the transfer of its functions to the Countering Weapons of Mass Destruction Office (CWMD), no funds are included in the Fiscal Year (FY) 2019 President's Budget or FY 2020 President's Budget for the Domestic Nuclear Detection Office (DNDO). Further information on funding for those functions can be found in the FY 2020 President's Budget for CWMD.

Operations and Support
Budget Authority and Obligations

Budget Authority *(Dollars in Thousands)*	FY 2018	FY 2019	FY 2020
Enacted/Request	**$54,664**	**-**	**-**
Carryover and/or Recoveries (Actual/Estimates/Projections)	-	-	-
Rescissions to Current Year/Budget Year	-	-	-
Net Sequestered Resources	-	-	-
Reprogrammings/Transfers	($2,733)	-	-
Supplementals	-	-	-
Total Budget Authority	**$51,931**	**-**	**-**
Collections – Reimbursable Resources	$3,804	-	-
Total Budget Resources	**$55,735**	**-**	**-**
Obligations (Actual/Estimates/Projections)	$54,794	-	-
Personnel: Positions and FTE			
Enacted/Request Positions	158	-	-
Enacted/Request FTE	144	-	-
Onboard and Actual FTE; Includes Collections - Reimbursable Resources			
Onboard (Actual/Estimates/Projections)	138	-	-
FTE (Actual/Estimates/Projections)	137	-	-

Operations and Support
Collections – Reimbursable Resources

Collections		FY 2018 Enacted			FY 2019 President's Budget			FY 2020 President's Budget		
(Dollars in Thousands)		Pos.	FTE	Amount	Pos.	FTE	Amount	Pos.	FTE	Amount
Department of Homeland Security - Federal Emergency Management Agency	**Source**	-	-	$100	-	-	-	-	-	-
Department of Homeland Security - Office of Health Affairs	**Source**	-	-	$2,075	-	-	-	-	-	-
Office of the Director of National Intelligence	**Source**	-	-	$176	-	-	-	-	-	-
Department of Homeland Security - Immediate Office of the Secretary	**Source**	-	-	$1,453	-	-	-	-	-	-
Total Collections		**-**	**-**	**$3,804**	**-**	**-**	**-**	**-**	**-**	**-**

Operations and Support
Summary of Budget Changes

Budget Formulation Activity *(Dollars in Thousands)*	Positions	FTE	Amount
FY 2018 Enacted	**158**	**144**	**$54,664**
FY 2019 President's Budget	**-**	**-**	**-**
FY 2020 Base Budget	**-**	**-**	**-**
FY 2020 Request	**-**	**-**	**-**
FY 2019 To FY 2020 Change	**-**	**-**	**-**

Operations and Support
Personnel Compensation and Benefits
Pay Summary

Organization (Dollars in Thousands)	FY 2018 Enacted				FY 2019 President's Budget				FY 2020 President's Budget				FY 2019 to FY 2020 Total			
	Pos.	FTE	Amount	Rate	Pos.	FTE	Amount	Rate	Pos.	FTE	Amount	Rate	Pos.	FTE	Amount	Rate
Mission Support	158	144	$28,329	$174.51	-	-	-	-	-	-	-	-	-	-	-	-
Total	**158**	**144**	**$28,329**	**$174.51**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Discretionary - Appropriation	158	144	$28,329	$174.51	-	-	-	-	-	-	-	-	-	-	-	-

* The FTE Rate calculation does not include Object Class 11.8-Special Personal Services Payments or 13.0-Benefits for Former Personnel.

Pay by Object Class

Pay Object Classes (Dollars in Thousands)	FY 2018 Enacted	FY 2019 President's Budget	FY 2020 President's Budget	FY 2019 - FY 2020 Change
11.1 Full-time Permanent	$19,090	-	-	-
11.5 Other Personnel Compensation	$250	-	-	-
11.8 Special Personal Services Payments	$3,200	-	-	-
12.1 Civilian Personnel Benefits	$5,789	-	-	-
Total - Personnel Compensation and Benefits	**$28,329**	**-**	**-**	**-**
Positions and FTE				
Positions - Civilian	158	-	-	-
FTE - Civilian	144	-	-	-

Operations and Support
Permanent Positions by Grade – Appropriation

Grades and Salary Range *(Dollars in Thousands)*	FY 2018 Enacted	FY 2019 President's Budget	FY 2020 President's Budget	FY 2019 to FY 2020 Change
Total, SES	11	-	-	-
GS-15	58	-	-	-
GS-14	54	-	-	-
GS-13	15	-	-	-
GS-12	9	-	-	-
GS-11	5	-	-	-
GS-9	4	-	-	-
GS-7	1	-	-	-
GS-3	1	-	-	-
Total Permanent Positions	**158**	**-**	**-**	**-**
Total Perm. Employment (Filled Positions) EOY	158	-	-	-
Position Locations				
Headquarters	158	-	-	-
Averages				
Average Personnel Costs, ES Positions	183,279	-	-	-
Average Personnel Costs, GS Positions	129,676	-	-	-
Average Grade, GS Positions	14	-	-	-

Operations and Support
Non Pay Budget Exhibits

Non Pay Summary

Organization *(Dollars in Thousands)*	FY 2018 Enacted	FY 2019 President's Budget	FY 2020 President's Budget	FY 2019 to FY 2020 Total Changes
Mission Support	$26,335	-	-	-
Total	**$26,335**	-	-	-
Discretionary - Appropriation	$26,335	-	-	-

Non Pay by Object Class

Non-Pay Object Classes *(Dollars in Thousands)*	FY 2018 Enacted	FY 2019 President's Budget	FY 2020 President's Budget	FY 2019 to FY 2020 Change
21.0 Travel and Transportation of Persons	$106	-	-	-
23.1 Rental Payments to GSA	$5,875	-	-	-
24.0 Printing and Reproduction	$23	-	-	-
25.1 Advisory and Assistance Services	$11,288	-	-	-
25.2 Other Services from Non-Federal Sources	$166	-	-	-
25.3 Other Goods and Services from Federal Sources	$8,128	-	-	-
25.7 Operation and Maintenance of Equipment	$370	-	-	-
26.0 Supplies and Materials	$147	-	-	-
31.0 Equipment	$232	-	-	-
Total - Non Pay Object Classes	**$26,335**	**-**	**-**	**-**

Mission Support – PPA

Budget Comparison and Adjustments

Comparison of Budget Authority and Request

Organization (Dollars in Thousands)	FY 2018 Enacted			FY 2019 President's Budget			FY 2020 President's Budget			FY 2019 to FY 2020 Total Changes		
	Pos.	FTE	Amount	Pos.	FTE	Amount	Pos.	FTE	Amount	Pos.	FTE	Amount
Mission Support	158	144	$54,664	-	-	-	-	-	-	-	-	-
Total	**158**	**144**	**$54,664**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Subtotal Discretionary - Appropriation	158	144	$54,664	-	-	-	-	-	-	-	-	-

PPA Level I Description

With the transfer of its functions to CWMD, no funds are included in the FY 2019 President's Budget or FY 2020 President's Budget for DNDO. Further information on funding for those functions can be found in the FY 2020 President's Budget for CWMD.

Mission Support – PPA
Budget Authority and Obligations

Budget Authority *(Dollars in Thousands)*	FY 2018	FY 2019	FY 2020
Enacted/Request	**$54,664**	**-**	**-**
Carryover and/or Recoveries (Actual/Estimates/Projections)	-	-	-
Rescissions to Current Year/Budget Year	-	-	-
Net Sequestered Resources	-	-	-
Reprogrammings/Transfers	($2,733)	-	-
Supplementals	-	-	-
Total Budget Authority	**$51,931**	**-**	**-**
Collections – Reimbursable Resources	$3,804	-	-
Total Budget Resources	**$55,735**	**-**	**-**
Obligations (Actual/Estimates/Projections)	$54,794	-	-
Personnel: Positions and FTE			
Enacted/Request Positions	158	-	-
Enacted/Request FTE	144	-	-
Onboard and Actual FTE; Includes Collections - Reimbursable Resources			
Onboard (Actual/Estimates/Projections)	138	-	-
FTE (Actual/Estimates/Projections)	137	-	-

Mission Support – PPA
Collections – Reimbursable Resources

Collections		FY 2018 Enacted			FY 2019 President's Budget			FY 2020 President's Budget		
(Dollars in Thousands)		Pos.	FTE	Amount	Pos.	FTE	Amount	Pos.	FTE	Amount
Department of Homeland Security - Federal Emergency Management Agency	**Source**	-	-	$100	-	-	-	-	-	-
Department of Homeland Security - Office of Health Affairs	**Source**	-	-	$2,075	-	-	-	-	-	-
Office of the Director of National Intelligence	**Source**	-	-	$176	-	-	-	-	-	-
Department of Homeland Security - Immediate Office of the Secretary	**Source**	-	-	$1,453	-	-	-	-	-	-
Total Collections		-	-	**$3,804**	-	-	-	-	-	-

Mission Support – PPA
Summary of Budget Changes

Budget Formulation Activity *(Dollars in Thousands)*	Positions	FTE	Amount
FY 2018 Enacted	**158**	**144**	**$54,664**
FY 2019 President's Budget	**-**	**-**	**-**
FY 2020 Base Budget	**-**	**-**	**-**
FY 2020 Request	**-**	**-**	**-**
FY 2019 To FY 2020 Change	**-**	**-**	**-**

Mission Support – PPA
Personnel Compensation and Benefits
Pay Summary

Organization (Dollars in Thousands)	FY 2018 Enacted				FY 2019 President's Budget				FY 2020 President's Budget				FY 2019 to FY 2020 Total			
	Pos.	FTE	Amount	Rate	Pos.	FTE	Amount	Rate	Pos.	FTE	Amount	Rate	Pos.	FTE	Amount	Rate
Mission Support	158	144	$28,329	$174.51	-	-	-	-	-	-	-	-	-	-	-	-
Total	**158**	**144**	**$28,329**	**$174.51**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Discretionary - Appropriation	158	144	$28,329	$174.51	-	-	-	-	-	-	-	-	-	-	-	-

* The FTE Rate calculation does not include Object Class 11.8-Special Personal Services Payments or 13.0-Benefits for Former Personnel.

Pay by Object Class

Pay Object Classes (Dollars in Thousands)	FY 2018 Enacted	FY 2019 President's Budget	FY 2020 President's Budget	FY 2019 - FY 2020 Change
11.1 Full-time Permanent	$19,090	-	-	-
11.5 Other Personnel Compensation	$250	-	-	-
11.8 Special Personal Services Payments	$3,200	-	-	-
12.1 Civilian Personnel Benefits	$5,789	-	-	-
Total - Personnel Compensation and Benefits	**$28,329**	**-**	**-**	**-**
Positions and FTE				
Positions - Civilian	158	-	-	-
FTE - Civilian	144	-	-	-

Mission Support – PPA
Non Pay Budget Exhibits

Non Pay Summary

Organization *(Dollars in Thousands)*	FY 2018 Enacted	FY 2019 President's Budget	FY 2020 President's Budget	FY 2019 to FY 2020 Total Changes
Mission Support	$26,335	-	-	-
Total	**$26,335**	-	-	-
Discretionary - Appropriation	$26,335	-	-	-

Non Pay by Object Class

Non-Pay Object Classes *(Dollars in Thousands)*	FY 2018 Enacted	FY 2019 President's Budget	FY 2020 President's Budget	FY 2019 to FY 2020 Change
21.0 Travel and Transportation of Persons	$106	-	-	-
23.1 Rental Payments to GSA	$5,875	-	-	-
24.0 Printing and Reproduction	$23	-	-	-
25.1 Advisory and Assistance Services	$11,288	-	-	-
25.2 Other Services from Non-Federal Sources	$166	-	-	-
25.3 Other Goods and Services from Federal Sources	$8,128	-	-	-
25.7 Operation and Maintenance of Equipment	$370	-	-	-
26.0 Supplies and Materials	$147	-	-	-
31.0 Equipment	$232	-	-	-
Total - Non Pay Object Classes	**$26,335**	**-**	**-**	**-**

Department of Homeland Security

Domestic Nuclear Detection Office

Procurement, Construction, and Improvements

Fiscal Year 2020
Congressional Justification

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Procurement, Construction, and Improvements
Budget Comparison and Adjustments

Comparison of Budget Authority and Request

Organization *(Dollars in Thousands)*	FY 2018 Enacted	FY 2019 President's Budget	FY 2020 President's Budget	FY 2019 to FY 2020 Total Changes
Large Scale Detection Systems	$64,524	-	-	-
Human Portable Rad/Nuc Systems	$24,572	-	-	-
Total	**$89,096**	**-**	**-**	**-**
Discretionary - Appropriation	$89,096	-	-	-

With the transfer of the functions of the Domestic Nuclear Detection Office (DNDO) to the Countering Weapons of Mass Destruction Office (CWMD), no funds are included in either the FY 2019 President's Budget or the FY 2020 President's Budget for DNDO's Procurement, Construction, and Improvements (PC&I) appropriation. Funding for the programs previously supported through this appropriation and its Programs, Projects, and Activities (PPAs) are discussed in the FY 2020 President's Budget for CWMD.

Procurement, Construction, and Improvements
Budget Authority and Obligations

Budget Authority *(Dollars in Thousands)*	**FY 2018**	**FY 2019**	**FY 2020**
Enacted/Request	**$89,096**	**-**	**-**
Carryover and/or Recoveries (Actual/Estimates/Projections)	$22,713	-	-
Rescissions to Current Year/Budget Year	-	-	-
Net Sequestered Resources	-	-	-
Reprogrammings/Transfers	$7,643	-	-
Supplementals	-	-	-
Total Budget Authority	**$119,452**	**-**	**-**
Collections – Reimbursable Resources	$5	-	-
Total Budget Resources	**$119,457**	**-**	**-**
Obligations (Actual/Estimates/Projections)	$70,767	-	-
Personnel: Positions and FTE			
Enacted/Request Positions	-	-	-
Enacted/Request FTE	-	-	-
Onboard and Actual FTE; Includes Collections - Reimbursable Resources			
Onboard (Actual/Estimates/Projections)	-	-	-
FTE (Actual/Estimates/Projections)	-	-	-

Procurement, Construction, and Improvements
Summary of Budget Changes

Budget Formulation Activity *(Dollars in Thousands)*	Positions	FTE	Amount
FY 2018 Enacted	-	-	**$89,096**
FY 2019 President's Budget	-	-	-
FY 2020 Base Budget	-	-	-
FY 2020 Request	-	-	-
FY 2019 To FY 2020 Change	-	-	-

Procurement, Construction, and Improvements
Non Pay Budget Exhibits

Non Pay by Object Class

Non-Pay Object Classes *(Dollars in Thousands)*	FY 2018 Enacted	FY 2019 President's Budget	FY 2020 President's Budget	FY 2019 to FY 2020 Change
25.1 Advisory and Assistance Services	$6,319	-	-	-
25.3 Other Goods and Services from Federal Sources	$7,300	-	-	-
31.0 Equipment	$75,477	-	-	-
Total - Non Pay Object Classes	**$89,096**	**-**	**-**	**-**

Procurement, Construction, and Improvements
Capital Investments Exhibits

Capital Investments

Investment *(Dollars in Thousands)*	Unique Item Identifier	Acquisition Level	Procurement/ Construction	IT/Non-IT	MAOL	FY 2018 Enacted	FY 2019 President's Budget	FY 2020 President's Budget
Large Scale Detection Systems	-	2	Procurement	Non-IT	Yes	$64,524	-	-
Human Portable Rad/Nuc Systems	-	3	Procurement	Non-IT	No	$24,572	-	-

Large Scale Detection Systems – Investment

Capital Investments Exhibits

Procurement/Acquisition Programs

Investment *(Dollars in Thousands)*	**Unique Item Identifier**	**Acquisition Level**	**Procurement/ Construction**	**IT/Non-IT**	**MAOL**	**FY 2018 Enacted**	**FY 2019 President's Budget**	**FY 2020 President's Budget**
Large Scale Detection Systems	-	2	Procurement	Non-IT	Yes	$64,524	-	-

With the transfer of the functions of DNDO to CWMD, no funds are included in either the FY 2019 President's Budget or the FY 2020 President's Budget for DNDO's Large Scale Detection Systems PPA are discussed in the FY 2020 President's Budget for CWMD.

The full Capital Investment Exhibit for this investment program can be reviewed in the CWMD PC&I appropriation.

Human Portable Rad/Nuc Systems – Investment

Capital Investments Exhibits

Procurement/Acquisition Programs

Investment *(Dollars in Thousands)*	**Unique Item Identifier**	**Acquisition Level**	**Procurement/ Construction**	**IT/Non-IT**	**MAOL**	**FY 2018 Enacted**	**FY 2019 President's Budget**	**FY 2020 President's Budget**
Human Portable Rad/Nuc Systems	-	3	Procurement	Non-IT	No	$24,572	-	-

With the transfer of the functions of DNDO to CWMD, no funds are included in either the FY 2019 President's Budget or the FY 2020 President's Budget for DNDO's Human Portable Rad/Nuc Systems PPA. Funding for the programs previously supported through this PPA are discussed in the FY 2020 President's Budget for CWMD.

The full Capital Investment Exhibit for this investment program can be reviewed in the CWMD PC&I appropriation.

Department of Homeland Security

Domestic Nuclear Detection Office

Research and Development

Fiscal Year 2020
Congressional Justification

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Research and Development

Budget Comparison and Adjustments

Comparison of Budget Authority and Request

Organization (Dollars in Thousands)	FY 2018 Enacted			FY 2019 President's Budget			FY 2020 President's Budget			FY 2019 to FY 2020 Total Changes		
	Pos.	FTE	Amount	Pos.	FTE	Amount	Pos.	FTE	Amount	Pos.	FTE	Amount
Architecture Planning and Analysis	-	-	$15,937	-	-	-	-	-	-	-	-	-
Transformational Research and Development	-	-	$62,081	-	-	-	-	-	-	-	-	-
Detection Capability Development	-	-	$15,155	-	-	-	-	-	-	-	-	-
Detection Capability Assessments	-	-	$34,127	-	-	-	-	-	-	-	-	-
Nuclear Forensics	-	-	$18,361	-	-	-	-	-	-	-	-	-
Total	**-**	**-**	**$145,661**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Subtotal Discretionary - Appropriation	-	-	$145,661	-	-	-	-	-	-	-	-	-

*The Countering Weapons of Mass Destruction Office (CWMD) was created in December of 2017 to elevate and focus the CWMD missions within DHS and to provide a focal point for the interagency. Funds appropriated FY18 and prior were appropriated to the Domestic Nuclear Detection Office (DNDO) and the Office of Health Affairs (OHA), respectively. Funds requested for CWMD in FY19 and FY20.

With the transfer of the functions of the Domestic Nuclear Detection Office (DNDO) to the Countering Weapons of Mass Destruction Office (CWMD), no funds are included in either the FY 2019 President's Budget or FY 2020 President's Budget for DNDO's Research and Development (R&D) appropriation.

DNDO's R&D appropriation funds fundamental knowledge discovery, basic and applied research, technology and systems development leading to product acquisition, test and evaluation, and associated costs.

Research and Development
Budget Authority and Obligations

Budget Authority *(Dollars in Thousands)*	**FY 2018**	**FY 2019**	**FY 2020**
Enacted/Request	**$145,661**	**-**	**-**
Carryover and/or Recoveries (Actual/Estimates/Projections)	$20,242	-	-
Rescissions to Current Year/Budget Year	-	-	-
Net Sequestered Resources	-	-	-
Reprogrammings/Transfers	($4,319)	-	-
Supplementals	-	-	-
Total Budget Authority	**$161,584**	**-**	**-**
Collections – Reimbursable Resources	$918	-	-
Total Budget Resources	**$162,502**	**-**	**-**
Obligations (Actual/Estimates/Projections)	$97,362	-	-
Personnel: Positions and FTE			
Enacted/Request Positions	-	-	-
Enacted/Request FTE	-	-	-
Onboard and Actual FTE; Includes Collections - Reimbursable Resources			
Onboard (Actual/Estimates/Projections)	-	-	-
FTE (Actual/Estimates/Projections)	-	-	-

Research and Development
Collections – Reimbursable Resources

Collections		FY 2018 Enacted			FY 2019 President's Budget			FY 2020 President's Budget		
(Dollars in Thousands)		Pos.	FTE	Amount	Pos.	FTE	Amount	Pos.	FTE	Amount
Department of Homeland Security - Science and Technology	**Source**	-	-	$795	-	-	-	-	-	-
Department of Homeland Security - Office of Health Affairs	**Source**	-	-	$123	-	-	-	-	-	-
Total Collections		-	-	**$918**	-	-	-	-	-	-

Research and Development
Summary of Budget Changes

Budget Formulation Activity *(Dollars in Thousands)*	Positions	FTE	Amount
FY 2018 Enacted	-	-	**$145,661**
FY 2019 President's Budget	-	-	-
FY 2020 Base Budget	-	-	-
FY 2020 Request	-	-	-
FY 2019 To FY 2020 Change	-	-	-

Research and Development
Non Pay Budget Exhibits

Non Pay Summary

Organization *(Dollars in Thousands)*	**FY 2018 Enacted**	**FY 2019 President's Budget**	**FY 2020 President's Budget**	**FY 2019 to FY 2020 Total Changes**
Architecture Planning and Analysis	$15,937	-	-	-
Transformational Research and Development	$62,081	-	-	-
Detection Capability Development	$15,155	-	-	-
Detection Capability Assessments	$34,127	-	-	-
Nuclear Forensics	$18,361	-	-	-
Total	**$145,661**	**-**	**-**	**-**
Discretionary - Appropriation	$145,661	-	-	-

Non Pay by Object Class

Non-Pay Object Classes *(Dollars in Thousands)*	**FY 2018 Enacted**	**FY 2019 President's Budget**	**FY 2020 President's Budget**	**FY 2019 to FY 2020 Change**
21.0 Travel and Transportation of Persons	$1,003	-	-	-
25.1 Advisory and Assistance Services	$38,192	-	-	-
25.2 Other Services from Non-Federal Sources	$116	-	-	-
25.3 Other Goods and Services from Federal Sources	$44,265	-	-	-
25.5 Research and Development Contracts	$49,889	-	-	-
26.0 Supplies and Materials	$10	-	-	-
31.0 Equipment	$46	-	-	-
41.0 Grants, Subsidies, and Contributions	$12,140	-	-	-
Total - Non Pay Object Classes	**$145,661**	**-**	**-**	**-**

Architecture Planning and Analysis – PPA

Budget Comparison and Adjustments

Comparison of Budget Authority and Request

Organization (Dollars in Thousands)	FY 2018 Enacted			FY 2019 President's Budget			FY 2020 President's Budget			FY 2019 to FY 2020 Total Changes		
	Pos.	FTE	Amount	Pos.	FTE	Amount	Pos.	FTE	Amount	Pos.	FTE	Amount
Architecture Planning and Analysis	-	-	$15,937	-	-	-	-	-	-	-	-	-
Total	**-**	**-**	**$15,937**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Subtotal Discretionary - Appropriation	-	-	$15,937	-	-	-	-	-	-	-	-	-

PPA Level I Description

With the transfer of the functions of DNDO to CWMD, no funds are included in either the FY 2019 President's Budget or the FY 2020 President's Budget for DNDO's Architecture Planning and Analysis (APA) PPA.

The APA PPA coordinates the development of enhanced radiological and nuclear (R/N) detection capabilities and the implementation of capabilities within the United States. Its objective is to improve the capability to understand, anticipate, and mitigate the risk of nuclear terrorism. These efforts enable DHS to determine and address gaps and vulnerabilities in existing R/N detection capabilities. This is accomplished through a continuous process of stakeholder engagement involving the operational Components of the Department; other Federal agencies; and State, local, territorial, and tribal (SLTT) partners to formulate and adjust program plans and investment options, on an annual basis, that addresses the threat of nuclear terrorism across the Nation's homeland security enterprise.

Architecture Planning and Analysis – PPA
Budget Authority and Obligations

Budget Authority *(Dollars in Thousands)*	**FY 2018**	**FY 2019**	**FY 2020**
Enacted/Request	**$15,937**	**-**	**-**
Carryover and/or Recoveries (Actual/Estimates/Projections)	$2,605	-	-
Rescissions to Current Year/Budget Year	-	-	-
Net Sequestered Resources	-	-	-
Reprogrammings/Transfers	-	-	-
Supplementals	-	-	-
Total Budget Authority	**$18,542**	**-**	**-**
Collections – Reimbursable Resources	$122	-	-
Total Budget Resources	**$18,664**	**-**	**-**
Obligations (Actual/Estimates/Projections)	$11,832	-	-
Personnel: Positions and FTE			
Enacted/Request Positions	-	-	-
Enacted/Request FTE	-	-	-
Onboard and Actual FTE; Includes Collections - Reimbursable Resources			
Onboard (Actual/Estimates/Projections)	-	-	-
FTE (Actual/Estimates/Projections)	-	-	-

Architecture Planning and Analysis – PPA
Summary of Budget Changes

Budget Formulation Activity *(Dollars in Thousands)*	Positions	FTE	Amount
FY 2018 Enacted	-	-	**$15,937**
FY 2019 President's Budget	-	-	-
FY 2020 Base Budget	-	-	-
FY 2020 Request	-	-	-
FY 2019 To FY 2020 Change	-	-	-

Architecture Planning and Analysis – PPA
Non Pay Budget Exhibits

Non Pay Summary

Organization *(Dollars in Thousands)*	**FY 2018 Enacted**	**FY 2019 President's Budget**	**FY 2020 President's Budget**	**FY 2019 to FY 2020 Total Changes**
Architecture Planning and Analysis	$15,937	-	-	-
Total	**$15,937**	-	-	-
Discretionary - Appropriation	$15,937	-	-	-

Non Pay by Object Class

Non-Pay Object Classes *(Dollars in Thousands)*	**FY 2018 Enacted**	**FY 2019 President's Budget**	**FY 2020 President's Budget**	**FY 2019 to FY 2020 Change**
21.0 Travel and Transportation of Persons	$340	-	-	-
25.1 Advisory and Assistance Services	$11,956	-	-	-
25.2 Other Services from Non-Federal Sources	$116	-	-	-
25.3 Other Goods and Services from Federal Sources	$3,469	-	-	-
26.0 Supplies and Materials	$10	-	-	-
31.0 Equipment	$46	-	-	-
Total - Non Pay Object Classes	**$15,937**	**-**	**-**	**-**

Non Pay Cost Drivers

Leading Non Pay Cost-Drivers *(Dollars in Thousands)*	**FY 2018 Enacted**	**FY 2019 President's Budget**	**FY 2020 President's Budget**	**FY 2019 to FY 2020 Total Changes**
Analysis	$8,479	-	-	-
Solutions Management Program	$2,924	-	-	-
Planning and Reporting	$ 2,318	-	-	-
International Program	$ 2,216	-	-	-
Total – Non Pay Cost Drivers	**$15,937**	**-**	**-**	**-**

Explanation of Non Pay Cost Drivers

Analysis: The Analysis Project evaluates the Nation's ability to detect nuclear or other radioactive materials out of regulatory control to enable the USG to plan a more effective and efficient R/N detection capability in order to manage national security risk and make R/N terrorism prohibitively difficult. This includes formal efforts to: define the threat; identify vulnerabilities; and evaluate consequences and the subsequent risk of R/N terrorism. Deliberate planning, modeling, and analysis of the R/N detection capabilities directly contribute to effective programming and budgeting decisions which contribute to making nuclear terrorism prohibitively difficult for our adversaries. No funds are planned in FY 2019 and FY 2020 because of the transfer of DNDO functions to CWMD.

Solutions Management: The Solutions Management Project collaborates with stakeholders, partners, and end-users to develop material and non-material solutions to reduce the risk from R/N threats. This effort is focused on gaps and vulnerabilities, operating environments, modes of transportation, and/or specific threats. Prior to the beginning of FY 2019, Solutions Development legacy Interior projects were transferred to the Planning and Reporting Program. No funds are planned in FY 2019 and FY 2020 because of the transfer of DNDO functions to CWMD.

Planning and Reporting: The Planning and Reporting Project coordinates engagement with DNDO's DHS and interagency partners for strategic and implementation planning for R/N detection capabilities, summarizing the accomplishments through reporting, and promoting interagency dialogue and engagement. This project supports fulfillment of DNDO's mandate to coordinate an enhanced R/N detection capability by facilitating the development of strategic, implementation, and operational concepts and plans for nuclear detection programs, activities, and capabilities. This project also coordinates and manages performance measure development and reporting, and collaborates with DHS Components to create and deliver congressionally mandated reports. No funds are planned in FY 2019 and FY 2020 because of the transfer of DNDO functions to CWMD.

International: The International Project works closely with the USG interagency, international organizations, and foreign partners to develop and deliver workshops and training courses on nuclear detection architecture best practices and planning and implementation tools. No funds are planned in FY 2019 and FY 2020 because of the transfer of DNDO functions to CWMD.

Architecture Planning and Analysis – PPA
Research and Development

Technology Readiness Level Exhibit

Architecture, Planning, and Analysis Program

Project Description

The DNDO Architecture, Planning, and Analysis Program coordinates the development of enhanced radiological and nuclear (R/N) detection capability and the implementation of capabilities within the United States.

- **Problem:** The R/N detection mission requires the coordinated efforts of multiple agencies across domains (i.e., land, air, maritime) and agencies (within and outside DHS) to be effective. Without a coordinating organization to analyze capability gaps, determine technical and non-technical requirements, and coordinate between U.S. agencies and, in some cases, international partners, this can never be achieved. Lack of coordination in the R/N mission space would result in increased risk to the Homeland of R/N terrorism and related threats.
- **Solution:** Provide the full spectrum of threat analysis, mission and capabilities based analysis, and requirements development to feed DNDO and DHS R&D, procurement, and other capability improvement efforts. Influence foreign partner countries and international organizations to advance global R/N detection capabilities and promote integration with domestic efforts. Provide planning capabilities to further coordinate actions and to represent R/N detection capability equities in related Department and USG plans. Draft, coordinate, and deliver reports to congressional and other external stakeholders.
- **Impact:** These efforts enable DHS to determine, address, and communicate gaps and vulnerabilities in existing R/N detection capabilities. This is accomplished through a continuous process of stakeholder engagement with other Federal agencies, operational DHS Components, and SLTT partners to formulate and adjust plans and investment options, on a regular basis, that address the threat of nuclear terrorism across the Nation's homeland security enterprise.

Architecture, Planning, and Analysis projects advance the capability to understand, anticipate, and reduce the threat of nuclear terrorism. Each of the following contributes to the development of strategies and plans for preventing R/N terrorism.

Sub-Projects

- *Planning and Reporting:* The Planning and Reporting Project coordinates engagement with DNDO's DHS and interagency partners for strategic and implementation planning for R/N detection capabilities, summarizing the accomplishments through reporting, and promoting interagency dialogue and engagement. This project supports fulfillment of DNDO's mandate to coordinate an enhanced R/N detection capability by facilitating the development of strategic, implementation, and operational concepts and plans for nuclear detection programs, activities, and capabilities. Through this project, DNDO coordinates and integrates the roles, responsibilities, and collective goals and objectives of the interagency R/N detection community, conducts strategic and operational planning, and ensures that DHS R/N prevention activities are integrated into DHS policies, strategies, and plans. This project also coordinates and manages performance measure development and reporting, collaborates with DHS Components to create and deliver congressionally mandated reports such as the *GNDA Joint Interagency Review* and the DHS GNDA Strategic Plan of Investments.

- *Analysis:* The Analysis Project evaluates the Nation's ability to detect nuclear or other radioactive materials out of regulatory control to enable the USG plan a more effective and efficient R/N detection capability in order to manage national security risk and make R/N terrorism prohibitively difficult. This includes formal efforts to: define the threat; identify vulnerabilities; and evaluate consequences and the subsequent risk of R/N terrorism. Through these efforts, the Analysis Project is able to characterize, communicate, and advise on risk-related issues in support of the DNDO, DHS, and USG policy making, planning processes, investment decisions, and stakeholder assessment needs. The Analysis Project is responsible for conducting periodic, in-depth analysis of the R/N detection capabilities to inform strategic, budgetary, and operational decisions across the Federal Government. Strategic planning and risk assessments provide the status of current detection capabilities while assessing and prioritizing proposed architectural enhancements. Deliberate planning, modeling, and analysis of the R/N detection capabilities directly contribute to effective programming and budgeting decisions which contribute to making nuclear terrorism prohibitively difficult for our adversaries.
- *Solutions Management:* The Solutions Management Project collaborates with stakeholders, partners, and end-users to develop material and non-material solutions to reduce the risk from R/N threats. This effort is focused on gaps and vulnerabilities, operating environments, modes of transportation, and/or specific threats. As a first step in the Solutions Development Process (SDP), the program leverages the outputs of Capabilities Based Assessments (CBA) and other analyses to identify R/N detection capability gaps. Furthermore, SDP engages stakeholders, operators, and others to capture requirements and develop necessary program documentation. This systematic approach is designed to reduce technical and programmatic risk of new material and non-material solutions that enter the development process.
- *International:* The International Project leads USG efforts to influence foreign countries through the development of guidance and best practice documents and associated awareness level courses with international organizations and initiatives, including the International Atomic Energy Agency (IAEA), the Global Initiative to Combat Nuclear Terrorism (GICNT), the International Law Enforcement Academy (ILEA), and the Nuclear Forensics International Technical Working Group (ITWG), and by working directly with bilateral partners. These efforts, which focus on the foundational elements of an architecture or nuclear forensics capability, such as strategy development / planning, risk, legal / regulatory, intelligence, the role of law enforcement, technical best practices, etc., are an agreed upon USG focus area and serve as a foundation for R/N detection capability coordination. Engagements guide future USG implementation efforts led by the Departments of State, Energy, and Defense. DNDO outreach efforts focus extensively on multilateral engagement opportunities. Leveraging existing USG footprints when and where possible helps capitalize on limited resources of like-minded partners to help serve as force multipliers in guiding and/or influencing a greater number of partners in their implementation efforts of national-level nuclear detection architectures. In select cases, DNDO works bilaterally with partners to jointly develop and/or enhance DNDO core competencies; i.e., architecture strategy development, detection and forensics-related R&D efforts, testing and evaluation, etc. Focusing on the up-front strategy / policy development of a national-level architecture (e.g., through establishment of guidance-level documents and supplementary awareness courses) sets the stage for more effective implementation of USG assistance programs to follow. DNDO efforts also focus on promoting the importance of detection within a country's interior and the role interior law enforcement plays in building a layered defense.

FY 2018 Key Milestone Events

- Planning and Reporting: Lead development of the GNDA Joint Annual Interagency Review.
- Analysis: Conduct development of Enterprise Architecture, Mission Essential Task List (METL), and Gap Identification.
- International: Worked in close collaboration with U.S. interagency partners, DHS attachés, and other DHS Operational Components with existing

authorities to advance strategic CWMD priorities. Collaborated with US Government (USG) and international agencies through meeting with foreign leaders, giving presentations to foreign audiences, and other related international activities in the CWMD mission space. CWMD engaged in multilateral work with the IAEA and bilateral engagements with many U.S. allies and partners.

FY 2019 Planned Key Milestone Events

- N/A.

FY 2020 Planned Key Milestone Events

- N/A.

Overall Project Funding

(Dollars in Thousands)	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020
Project Funding	$15,758	$15,072	$15,937		
Obligations	$15,394	$12,912	$9,128		

Project Schedule

Research & Development Description	Planned Start Date	Planned Completion
FY 2018		
Planning and Reporting: Lead development of the GNDA Joint Annual Interagency Review.	FY 2018 Q1	FY 2019 Q2
Analysis: Conduct development of Enterprise Architecture, Mission Essential Task List (METL), and Gap Identification	FY 2018 Q1	FY 2018 Q4
International: Worked in close collaboration with U.S. interagency partners, DHS attachés, and other DHS Operational Components with existing authorities to advance strategic CWMD priorities. Collaborated with US Government (USG) and international agencies through meeting with foreign leaders, giving presentations to foreign audiences, and other related international activities in the CWMD mission space. CWMD engaged in multilateral work with the IAEA and bilateral engagements with many U.S. allies and partners.	FY 2018 Q1	FY 2018 Q4

Type of Research

N/A.

Technology Readiness Level

N/A.

Transition Plans

N/A.

Transformational Research and Development – PPA

Budget Comparison and Adjustments

Comparison of Budget Authority and Request

Organization (Dollars in Thousands)	FY 2018 Enacted			FY 2019 President's Budget			FY 2020 President's Budget			FY 2019 to FY 2020 Total Changes		
	Pos.	FTE	Amount	Pos.	FTE	Amount	Pos.	FTE	Amount	Pos.	FTE	Amount
Transformational Research and Development	-	-	$62,081	-	-	-	-	-	-	-	-	-
Total	**-**	**-**	**$62,081**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Subtotal Discretionary - Appropriation	-	-	$62,081	-	-	-	-	-	-	-	-	-

PPA Level I Description

With the transfer of the functions of DNDO to CWMD, no funds are included in either the FY 2019 President's Budget or the FY 2020 President's Budget for DNDO's Transformational R&D (TRD) PPA. Funding for the programs previously supported through this PPA are discussed in CWMD's R&D appropriation.

DNDO's TRD identifies, explores, develops, and demonstrates scientific and technological approaches to improve performance and address gaps in R/N detection and forensics capabilities; and/or significantly reduce the operational burden of these technologies. DNDO works closely with partners to transition technologies from research to the field, including transfer of technologies to the commercial sector for development and commercialization.

DNDO has formalized its technology transition and transfer methodology, which describes the relationship among its PPAs as technologies progress from research, development to deployment. Projects in the TRD PPA historically had technology readiness levels (TRL) of one through seven. Going forward, the TRD account will generally manage technology development through TRL level six within CWMD. As appropriate, technology development at TRL level 6 and higher will be managed in other accounts. Deployment and support of material solutions will continue to be managed in the Procurement, Construction, and Improvements and in the Operations and Support appropriations.

R&D investments aligned with goals and priorities outlined in the *DNDO Transformational and Applied Research Roadmap and Implementation Strategy, Fiscal Years 2016 – 2021*, are issued as competitive awards open to researchers from all sectors: government laboratories, academia, and private industry. The transformational research efforts leverage the qualities and advantages of all three sectors to develop capability. Teaming is encouraged across the sectors. TRD is carried out within four major programs: Advanced Technology Demonstrations (ATD); Exploratory Research (ER); Academic Research Initiative (ARI); and the Small Business Innovation Research (SBIR) program. Each program is described in detail on the following pages along with the corresponding projects (ATD, SBIR) and research areas (ARI, ER).

Transformational Research and Development – PPA
Budget Authority and Obligations

Budget Authority *(Dollars in Thousands)*	**FY 2018**	**FY 2019**	**FY 2020**
Enacted/Request	**$62,081**	**-**	**-**
Carryover and/or Recoveries (Actual/Estimates/Projections)	$6,717	-	-
Rescissions to Current Year/Budget Year	-	-	-
Net Sequestered Resources	-	-	-
Reprogrammings/Transfers	($2,228)	-	-
Supplementals	-	-	-
Total Budget Authority	**$66,570**	**-**	**-**
Collections – Reimbursable Resources	$795	-	-
Total Budget Resources	**$67,365**	**-**	**-**
Obligations (Actual/Estimates/Projections)	$47,098	-	-
Personnel: Positions and FTE			
Enacted/Request Positions	-	-	-
Enacted/Request FTE	-	-	-
Onboard and Actual FTE; Includes Collections - Reimbursable Resources			
Onboard (Actual/Estimates/Projections)	-	-	-
FTE (Actual/Estimates/Projections)	-	-	-

Transformational Research and Development – PPA
Summary of Budget Changes

Budget Formulation Activity *(Dollars in Thousands)*	Positions	FTE	Amount
FY 2018 Enacted	-	-	**$62,081**
FY 2019 President's Budget	-	-	-
FY 2020 Base Budget	-	-	-
FY 2020 Request	-	-	-
FY 2019 To FY 2020 Change	-	-	-

Transformational Research and Development – PPA
Non Pay Budget Exhibits

Non Pay Summary

Organization *(Dollars in Thousands)*	**FY 2018 Enacted**	**FY 2019 President's Budget**	**FY 2020 President's Budget**	**FY 2019 to FY 2020 Total Changes**
Transformational Research and Development	$62,081	-	-	-
Total	**$62,081**	**-**	**-**	**-**
Discretionary - Appropriation	$62,081	-	-	-

Non Pay by Object Class

Non-Pay Object Classes *(Dollars in Thousands)*	**FY 2018 Enacted**	**FY 2019 President's Budget**	**FY 2020 President's Budget**	**FY 2019 to FY 2020 Change**
21.0 Travel and Transportation of Persons	$150	-	-	-
25.1 Advisory and Assistance Services	$2,371	-	-	-
25.5 Research and Development Contracts	$48,070	-	-	-
41.0 Grants, Subsidies, and Contributions	$11,490	-	-	-
Total - Non Pay Object Classes	**$62,081**	**-**	**-**	**-**

Non Pay Cost Drivers

Leading Non Pay Cost-Drivers *(Dollars in Thousands)*	**FY 2018 Enacted**	**FY 2019 President's Budget**	**FY 2020 President's Budget**	**FY 2019 to FY 2020 Total Changes**
Academic Research Initiative	$11,964			
Exploratory Research	$25,768			
Advanced Technology Demonstration	$22,410			
Small Business Innovation Research*	$1,939			
Total – Non Pay Cost Drivers	**$62,081**			

*Small Business Innovation Research (SBIR) funding shown only reflects Transformational Research and Development funding. Actual amount of R&D set aside for small business is determined in the year of execution after assessing the appropriations, and comparison of responses to DNDO's annual announcement for proposals to DNDO mission requirements.

Explanation of Non Pay Cost Drivers

Academic Research Initiative: The Academic Research Initiative (ARI) program has two primary objectives: 1) Advance fundamental knowledge in the sciences and engineering related to radiological and nuclear threat detection and forensics needed to solve long-term, high-risk challenges; and 2) Develop the next generation workforce in the nuclear sciences, engineering, and related fields. No funds are planned in FY 2019 and FY 2020 because of the transfer of DNDO functions to CWMD.

Exploratory Research: The Exploratory Research (ER) program explores innovative, high-risk technologies that address gaps in U.S. R/N detection capabilities, provide improvements in performance or reduction in cost of R/N detection capabilities, and enhance nuclear forensics capabilities. No funds are planned in FY 2019 and FY 2020 because of the transfer of DNDO functions to CWMD.

Advanced Technology Demonstrations: The Advanced Technology Demonstration program performs accelerated development, characterization, and demonstration of leading-edge technologies that address critical gaps in nuclear detection and forensics capabilities. No funds are planned in FY 2019 and FY 2020 because of the transfer of DNDO functions to CWMD.

Transformational Research and Development – PPA
Research and Development

Technology Readiness Level Exhibit

Advanced Technology Demonstrations (ATD)

Project Description

The Advanced Technology Demonstrations (ATD) program performs accelerated development, characterization, and demonstration of leading-edge technologies that address critical gaps in nuclear detection and forensics capabilities.

- **Problem:** Analyses and reviews conducted by DNDO in conjunction with USG partner agencies on radiological and nuclear detection and forensics capabilities have resulted in the identification of five grand challenges:
  - Cost effective equipment with sufficient performance to ensure wide-spread deployment;
  - Detection of special nuclear material (SNM), i.e. uranium or plutonium, especially when shielded;
  - Enhanced wide area search capabilities in a variety of scenarios, to include urban and highly cluttered environments;
  - Monitoring along challenging threat pathways; and
  - Forensics determination of the origin and history of interdicted materials.
- **Solution:** The ATD program performs accelerated development, characterization, and demonstration of leading-edge technologies that address critical gaps in nuclear detection capabilities. It builds on technology concepts previously demonstrated under the ER program, research conducted by DNDO's interagency partners, or privately funded research, further advancing the promising technologies into the next stage of development and system-level integration. Through the ATD program, technology concepts are developed into prototype systems called Performance Test Units (PTU), which provide reliable and scalable performance measurements in a challenging and realistic simulated or controlled operational environment. Through this characterization process, sufficient understanding of the technology is obtained to recommend a technology transition path for the PTU to a government acquisition program, commercial system development, or additional basic and applied research.

  New ATD projects are initiated approximately yearly based on: 1) prioritized gaps in U.S. R/N detection capabilities; and 2) technological successes from the ER program, the ARI, or other private or public research programs that support the prioritized gaps. Multiple research projects are being monitored for potential transition to an ATD.
- **Impact:** Through this program, technology is matured and integrated. Robust data sets are collected which define the performance envelope of the existing technology and are available to support requirements development efforts for future acquisition programs. The culminating Technology Demonstration and Characterization phase is important in that it defines the tangible technological benefits that can be achieved with real-world, integrated systems. Demonstration units are an essential tool in transitioning promising technologies because they are generally the first time operational end users get to interact with a new technology.

Sub-Projects

- *Nuclear and Radiological Imaging Platform (NRIP):* The NRIP sub-project leverages recent advancements in the commercial sector as well as prior TRD work. By combining the merits of passive and active technologies, new systems are being developed so that a single system is able to detect radiological and nuclear threats, regardless of the amount of shielding or the complexity of cargo, in primary mode with minimal impact to the flow of commerce. In addition to system performance characterization in a simulated operational environment, these systems will also undergo testing in a controlled, but realistic, operational environment. DNDO, in conjunction with U.S. Customs and Border Protection (CBP), characterized the Passport NRIP system at Conley Container Terminal in South Boston, in late FY 2017. In mid-FY 2018 there was a steam-of-commerce data collection at Conley Container Terminal with data analysis being completed in late FY 2018.
- *Radiation Awareness and Interdiction Network (RAIN)*: The RAIN sub-project is intended to develop and characterize technologies for monitoring highway traffic and their on-ramps for vehicles carrying nuclear or other radioactive threat materials. RAIN technologies have integrated networked radiation sensors with vehicle detection and identification systems to allow actionable information on threat-carrying vehicles to be passed to law enforcement. Two technical approaches are continuing to be developed, to include a gantry-based over-the-road solution compatible with COTS all-electronic tolling systems, and a side-of-the-road technology intended for rapid deployment. High interest in the capability has been expressed by the New York Police Department (NYPD), and initial interest by DHS agencies such as the CBP's Border Patrol. Analysis of early data collection coordinated with NYPD helped generate the required performance and suitability requirements for the RAIN systems. Government characterization of the prototype systems was completed in FY 2018. Planning is now underway for an operational demonstration of the technology in Florida in FY 2019.
- *Enhanced Radiological Nuclear Inspection and Evaluation (ERNIE):* The ERNIE system is an advanced machine learning (ML) based approach to analyze radiation portal monitor (RPM) scans for greater overall system performance (improved threat detection with reduced nuisance alarm rates). Key features are extracted from RPM scan data in real-time and supplied to ML algorithms to make a determination of the mostly likely class of the cargo: non-emitting, naturally occurring radioactive material, medical, industrial or special nuclear materials. This provides CBP Officers improved information on whether a conveyance should be released or inspected, and if inspected, information to enable the inspection process. A formal operational assessment was completed of ERNIE performance in FY 2016, resulting in a joint decision by DNDO and CBP to deploy the capability in 2018. The outcome of the assessment supported DNDO's first technology transition agreement of a research effort from development activities to integration and deployment activities. The first deployment occurred at the Virginia International Gateway (VIG) in May 2018.
- *Wearable Intelligent Nuclear Detection (WIND) Project*: The ability to interdict a moving threat or localize a threat during wide area search missions is a major technical challenge. The WIND sub-project will develop and characterize a highly-modular, multi-purpose, and human-portable (e.g., backpack or vest) system that greatly advances the ability to detect and interdict threats during across a multitude of search missions. The technical approach will merge two major sources of information to develop the design specifications. The first approach will utilize threat analysis to compare several critical design options, including the enhanced sensitivity of state-of-the-art radiation anomaly detection algorithms. The second approach will survey end users to gather initial requirements and then will proceed to spiral development, getting end user input along the way to develop a balanced and flexible system. A number of advanced capabilities will be fully characterized, to include spectral anomaly detection, spatial mapping/tracking, sophisticated background subtraction, and sensor fusion and networked capability. In FY 2016, DNDO issued a solicitation for the proposed research and development, and four awardees were selected across two topic areas to develop hardware and software (algorithms) aspects of a WIND prototype. In FY 2017, the proposed hardware and software

designs completed a review according to the performance assessment methods described above. In FY 2018, one hardware and one algorithm developer assembled a small set of performance test units to undergo a Characterization Readiness Review in preparation for demonstration and characterization for technology transition potential in FY 2019.

- *Mobile Urban Radiation Search (MURS):* The goal of the MURS sub-project is to efficiently migrate the knowledge and technology of previous Transformational R&D stand-off and long range detection projects into a production-ready, compact, next-generation mobile radiation detection platform. The MURS systems leverages state-of-the-art radiation detection, identification, and localization, fused with contextual sensing such as video, LIDAR, and high resolution GPS. Technology development began in FY 2015 with demonstration of the first spiral prototype in FY 2017. The project continued in FY 2018 with the development and deployment of two MURS prototypes to disparate operating environments. The deployments will be used to garner end-user input on design, performance, integration, and utility, such that additional development can be directed ahead of formal product acquisition.
- *SIGMA Transition:* SIGMA is a multi-pronged approach to the wide area monitoring and search problem for radiological and nuclear threats. The technology was transitioned to DNDO from the Defense Advanced Research Project Agency (DARPA) with shared funding in FY 2018. The guiding SIGMA tenets have been (1) foster commercial availability of inexpensive, wearable detectors far superior to available spectroscopic personal radiation detectors (SPRDs); (2) incorporate cutting edge, USG-funded detection algorithms; and (3) network the detectors via smartphone to a cloud computing architecture and provide system-level monitoring in addition to local read-out. In transitioning the technology, DNDO is taking the opportunity to evaluate how various SIGMA technologies will become effective tools in the larger framework of current and planned R/N detection capabilities. DNDO is planning and scoping several pilots for pathway-specific monitoring, particularly covering known smuggling routes in the Caribbean and Southeastern United States and potential deployments of foreign points of departure.

FY 2018 Key Milestone Events

- NRIP Sub-Project: Completed a steam-of-commerce data collection at Conley Container Terminal with data analysis being completed in late FY18
- RAIN Sub-Project: Completed government characterization of RAIN prototype systems. Initiated planning for an operational demonstration.
- ERNIE Sub-Project: Initial phased deployment in conjunction with CBP completed at the VIG.
- MURS Sub-Project: Deployed two MURS systems to Federal partners for rapid prototyping and commercialization. Prototyping efforts shall inform mobile system requirements for broader future deployment.
- WIND Sub-Project: Completed the characterization readiness reviews with WIND vendors. Finalized analysis and characterization plans to evaluate prototype performance during Technical Demonstration and Characterization in FY 2019.
- SIGMA Sub-Project: Transitioned SIGMA from DARPA to DNDO. Developed SIGMA pilot plan for DHS/DNDO.

FY 2019 Planned Key Milestone Events

- N/A.

FY 2020 Planned Key Milestone Events

- N/A.

Overall Project Funding

(Dollars in Thousands)	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020
Project Funding	$27,254	$25,324	$22,410	-	-
Obligations	$23,018	$21,780	$9,251	-	-

Project Schedule

Research & Development Description	Planned Start Date	Planned Completion
NRIP		
Passport Technology Demonstration and Characterization	FY 2017	FY 2018
Passport Data Analysis	FY 2017	FY 2019
Passport Final Report	FY 2018	FY 2019
RAIN		
Operational Demonstration	FY 2018	FY 2019
Final Report	FY 2017	FY 2019
ERNIE		
Phased Deployment with CBP/ Technology Transition	FY 2016	FY 2018
WIND		
Critical Design Review	FY 2018	FY 2018
Characterization Readiness Review	FY 2018	FY 2019
Technology Demonstration and Characterization	FY 2018	FY 2019
MURS		
Develop Eight MURS Units	FY 2017	FY 2018
Operational Pilots	FY 2018	FY 2019
HIRS		
SIGMA		
Transition SIGMA to DNDO	FY 2018	FY 2018
Develop DNDO Pilot Plan(s)	FY 2018	FY 2019
Conduct SIGMA Pilot(s)	FY 2018	FY 2020

Type of Research

Developmental

Technology Readiness Level

The Advanced Technology Demonstration program generally matures technology from TRL 5 to 7.

Transition Plans

The ATD project develops demonstration units that may result in several transition outcomes. They lead to the possibility of direct commercialization. They provide the basis for forming Technical Transition Agreements with DNDO for Federal acquisition. They also identify component technologies that require further maturation under the Exploratory Research project.

Exploratory Research (ER)

The Exploratory Research (ER) program explores innovative, high-risk technologies that address gaps in U.S. R/N detection capabilities, provide improvements in performance or reduction in cost of R/N detection capabilities, and enhance nuclear forensics capabilities.

- **Problem:** Recurring analyses conducted by DNDO and results from the joint interagency annual review of the National Strategic Five-Year Plan for Improving the Nuclear Forensics and Attribution Capabilities of the United States have highlighted a number of long-term technical grand challenges that provide a focus for research activities conducted under the ER program. Further, through across-government consensus in framing the Nuclear Defense Research and Development Roadmap (NDRD), several important grand challenges were identified to help inform agencies that enable capabilities through research and development related to detection and nuclear forensics. These grand challenges include:
  - Cost effective equipment with sufficient performance to ensure wide spread deployment (Cost Effective);
  - Detection of special nuclear material (SNM; i.e. uranium or plutonium, especially when shielded) (Shielding);
  - Enhanced wide area search capabilities in a variety of scenarios, to include urban and highly cluttered environments (Search);
  - Monitoring along challenging pathways in the architecture (Pathways); and
  - Forensics determination of the origin and history of interdicted materials (Forensics).
- **Solution:** The ER program explores innovative, high-risk, early to later-stage technologies. Specifically, the ER program researches technologies and techniques that:
  - Address capability gaps and weaknesses in the framework of R/N detection capabilities;
  - Provide substantial performance improvement and/or cost reduction of R/N detection capabilities; and
  - Improve nuclear forensics capabilities.
- **Impact:** Capabilities developed under the ER program can provide enabling technologies in support of the ATD program or directly spur commercial development.

Sub-Projects

- *Materials Research and Supporting Technologies (Materials):* The Materials sub-project has the technical objective of discovering new high performance and/or low cost gamma-ray and neutron sensing materials, significantly improving existing materials or lowering their costs, improving or developing new signal readout methods for these materials, and incorporating these materials into prototypes for test and

evaluation. Advances in this project impact most if not all of the other portfolios and Grand Challenges. This project focuses on the core detection materials used in most radiation detectors: scintillators and semiconductors. The project addresses improvements in types of materials ranging from those appropriate for handhelds, backpacks, and personal radiation detectors with very good energy resolution capable of superior isotope and threat identification, to those used in large portal monitors which would benefit from better isotope capabilities and discrimination between threat and non-threat. Project also addresses stability issues in portal plastics, both in terms of understanding the root cause of the issues as well as finding low cost and robust solutions. Links to the Cost Effective grand challenge.

- *Radiation Detection Technology (Radiation):* The Radiation sub-project emphasizes investigating novel approaches to greatly improve the ability to detect, identify, and locate threat materials based on their intrinsic radiological signatures. Research emphasis has been on improved gamma-ray detection approaches, particularly imaging, enabled by new electronics, sensor fusion, and advanced algorithms. Recent efforts are focused on development of technologies to make low operational burden R/N sensors available for a wide variety of law enforcement vehicles. Many of the improvements involve improving algorithms for faster detectability and better electronics to keep up with higher count scenarios. Improvements are being made in low gamma count scenarios where identification is difficult and better algorithms can leading to high confidence levels. Links to the Search grand challenge.
- *Shielded Special Nuclear Material (Shielding):* The Shielding sub-project addresses the critical challenge of being able to detect SNM and other threats even when heavily shielded or masked. ER projects under this Sub-Project are focused on development of component technologies to include next generation x-ray and neutron radiation sources for homeland security applications, algorithms enabling improved imaging for radiography, and detector materials that can be integrated into large scale systems for screening cargo and conveyances for shielded threats. This sub-project also investigates alternative approaches to shielded threat detection that do not rely on the use of ionizing radiation. Links to the Shielding grand challenge.
- *Advanced Analytics (Analytics):* The Analytics Sub-Project has two thrust areas: (1) algorithms are developed to improve the means and abilities to detect, locate, and identify threat materials, and (2) modeling and simulation tools are developed to aid in the analyses of R/N detection capabilities. They are used in the identification of capability gaps, risk assessments, and cost-benefit analyses. The intended end-user would use the analytics tool to aid decision makers in an operational environment to look for the most efficient but also effective path forward to meet mission requirements when given certain constraints.
- *Nuclear Forensics (Forensics):* The Forensics Sub-Project directly coordinates with DNDO's NTNFC mission to execute research and development to discover new forensics signatures of R/N material and to also develop the tools enabling comprehensive and timely analytical results. R&D conducted under this sub-project looks to collect signature data to increase our ability to answer questions about the history of interdicted material, develop models to provide predictive associations of that data, and to exploit the validated signatures to answer specific material origin questions.

FY 2018 Key Milestone Events

- Materials:
  - Initiated two new R&D activities leading to demonstrations in a simulated operational environment of a prototype RIID based on the newly developed, high efficiency, high energy resolution semiconductor gamma detector material thallium bromide. This material would provide a low cost and operationally effective alternative to the commercial off-the-shelf cadmium zinc telluride and high-purity germanium detector material.

- Radiation:
  - Initiated and conducted feasibility evaluation of one new R&D activity exploring approaches to make low operational burden R/N sensors available for a wide variety of law enforcement vehicles. This approach will fuse radiation data with contextual sensors and computer vision algorithms to continuously identify, track, and classify objects in the scene into categories useful for radiation propagation modeling.

- Shielding:
  - Initiated one new R&D activity aimed at developing the next generation pulsed x-ray source suitable for true active interrogation applications and high throughput for shielded threat detection. Effort is working toward high pulse rate and better pulse flexibility (energy, intensity, and timing), in a comparable size and cost to existing commercial x-ray sources.
  - Initiated two new R&D activities for development of a continuous output x-ray source that will enable high-throughput scanning for active interrogation for shielded threat detection.
  - Initiate two new R&D activities leading to demonstration of a prototype mobile active interrogation system using neutrons in a simulated operational environment.
  - Completed Proof of Concept demonstration for a series of enabling technologies to support rail cargo inspection to include fast detectors and a radiation source specifically designed to dramatically improve R/N detection in rail cargo.

- Analytics:
  - Initiated and conducted feasibility evaluation of one new R&D activity to conduct general research in how to use and extend a currently existing agent-based, physical security simulation package for the purpose of studying the probability of encounter for illegal, non-port-of-entry border crossings into the United States.
  - Demonstration of port-of-entry border crossings from the south was shown. Further improvements will be made for higher probability outcomes, but the proof of concept has been verified.

- Forensics:
  - Initiated and conducted feasibility evaluation of one new R&D activity for development of models to help predict morphological signatures of uranium and plutonium materials that can be used to link measured data on morphology with the process from which it was made.
  - Continued evaluating the performance of a DNDO-developed image analysis software as implemented by Technical Nuclear Forensics experts and enable their input in the development of the tool. This will result in development of a validated software tool to enable signature discovery, which has been reviewed and adapted to support a cross-section of Nuclear Forensics experts.
  - Completed a Proof-of-Concept demonstration of a method which will help enable more efficient and timely production of Neptunium-236 and other actinide Forensics reference materials.
  - Completed a Proof-of-Concept (beta delivery) of mass bias/linear correction software to make measurements during Forensics sample analysis more accurate.

FY 2019 Planned Key Milestone Events

- N/A.

FY 2020 Planned Key Milestone Events

- N/A.

Overall Project Funding

(Dollars in Thousands)	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020
Project Funding	$21,977	$21,165	$25,768	-	-
Obligations	$21,331	$19,316	$13,647	-	-

Project Schedule

Research & Development Description	Planned Start Date	Planned Completion
FY 2018		
Materials: Study of Plastic Scintillator Degradation Mechanisms	Ongoing	FY 2020 Q1
Materials: Bandgap Engineered Sensor for Active Interrogation of Cargo in Transit	Ongoing	FY 2019 Q1
Materials: Low-Cost Industrial Production of Halide Crystals	Ongoing	FY 2019 Q1
Materials: Ceramic Scintillators for Transmission Radiography	Ongoing	FY 2020 Q3
Materials: Large Scale Solid-State Organic Scintillators for Fission Neutron Detection	Ongoing	FY 2019 Q1
Materials: Automated Fabrication Chain for Thallium Bromide	Ongoing	FY 2020 Q1
Materials: High Resolution Scintillator and Detector Discovery	Ongoing	FY 2019 Q3
Materials: Low Cost, High Performance RadioIsotope Identification Detector (RIID) based on Thallium Bromide Semiconductor	FY 2018 Q4	FY 2021 Q4
Radiation: Radiation Portal Monitor Predictive Maintenance	Ongoing	FY 2021 Q2
Radiation: Low Operational Burden R/N Detection for Law Enforcement Vehicles	Ongoing	FY 2019 Q3
Radiation: Wide Area Search Baselining	Ongoing	FY 2020 Q1
Radiation: Understanding Cold Weather Degradation in Radiation Portal Monitors	FY 2018 Q4	FY 2020 Q4
Analytics: Big Data Analytics for Indicators of R/N Trafficking	Ongoing	FY 2020 Q4
Analytics: Probability of Encounter Modeling	Ongoing	FY 2020 Q3

Research & Development Description	Planned Start Date	Planned Completion
Analytics: Global Algorithms for Detection of Threats in Radiography (GADTR)	Ongoing	FY 2021 Q1
Analytics: Fusion of RN Sensor and Situational Data at Ports Of Entry	FY 2018 Q4	FY 2021 Q1
Analytics: Fusion of RN Sensor and Situational Data within US Interior	FY 2018 Q4	FY 2021 Q1
Analytics: Data Analytics and Anomaly Detection Implementation Plan	FY 2018 Q4	FY 2020 Q4
Forensics: Production Techniques for Nuclear Forensics Reference Materials	Ongoing	FY 2020 Q3
Forensics: Chemical Forensic Science of Plutonium Oxides	Ongoing	FY 2019 Q4
Forensics: Bonding and Distribution as a Function of Depth in Forensic Samples	Ongoing	FY 2019 Q4
Forensics: Predictive Morphological Modeling	FY 2018 Q1	FY 2020 Q1
Shielding: Next Generation Pulsed X-Ray Sources	FY 2018 Q4	FY 2021 Q3
Shielding: High Performance, Compact, Continuous Wave X-ray Sources	FY 2018 Q4	FY 2021 Q4
Shielding: Mobile Active Interrogation Using Neutrons	FY 2018 Q4	FY 2021 Q4

Type of Research

Applied

Technology Readiness Level

Levels 2-5.

Transition Plans

Successful ER technologies and concepts may transition to support subsequent ATD projects, future acquisitions, or directly spur commercial development. Results from activities under the Forensics sub-project will transition to the Technical Nuclear Forensics community.

Academic Research Initiative (ARI)

The Academic Research Initiative (ARI) program has two primary objectives: 1) advance fundamental knowledge in the sciences and engineering related to radiological and nuclear threat detection and forensics needed to solve long-term, high-risk challenges; and 2) develop the next generation workforce in the nuclear sciences, engineering, and related fields.

- **Problem:** The ARI addresses elements of the grand challenges (as first described on page 31 and shown again below) through breakthrough and fundamental research. Radiological and nuclear detection and nuclear forensics is multi-disciplinary. Areas traditionally associated with R/N expertise have aging subject matter experts and shrinking funding. Areas not traditionally associated with R/N expertise can provide new perspectives but are not necessarily aware of their potential impact. Analyses and reviews conducted by the USG partner agencies on radiological and nuclear detection and forensics capabilities have resulted in the identification of five grand challenges:
  - Cost effective equipment with sufficient performance to ensure wide spread deployment (Cost Effective).
  - Detection of special nuclear material (SNM), i.e. uranium or plutonium, especially when shielded (Shielding).
  - Enhanced wide area search capabilities in a variety of scenarios, to include urban and highly cluttered environments (Search).
  - Monitoring along challenging GNDA pathways (Pathways).
  - Forensics determination of the origin and history of interdicted materials (Forensics).

- **Solution:** Provide continued investment in fundamental science, engineering, and related fields to build capability at the university level. Students supported by the project are provided funding to help them in their work toward undergraduate and graduate degrees. The ARI program is also reaching out to non-traditional areas to solicit their ideas to solving R/N detection and forensics challenges.

- **Impact:** Since the ARI program was started in 2007, it has awarded over 100 grants to more than 55 academic institutions and sponsored over 160 students. These grants have resulted in over 580 journal publications which have increased the fundamental knowledge in areas such as nuclear engineering, physics, and chemistry, as well as other disciplines not traditionally associated with R/N detection like social sciences, deterrence theory, and applied mathematics.

The ARI Program follows established academic practices of peer review and competitive research awards. These practices include conducting an annual program review that enables faculty and student researchers funded by these competitively awarded DHS grants to present their latest finding to both DHS program managers as well as their peers. Presentations follow accepted practices used at scientific conferences: professors, post-doctoral research associates, and students give scheduled talks in topic area sessions; students present posters at forums designed to foster face-to-face interactions with researchers.

Sub Project

- *Materials Science for Nuclear Detection (Materials)* – Research in this area focuses on high-risk, long-term research aimed at developing greatly improved radiation detector materials for gammas and neutrons that are highly sensitive, selective, low-cost, and rugged. This research aims to

understand the fundamental properties of radiation sensing materials, such as mechanisms of light production in scintillator materials and charge mobility and lifetimes in semiconductor materials.

- *Analytical Techniques for Nuclear Detection (Analytics)* – This sub-project investigates innovative data processing and analysis techniques that will lead to major performance improvements through state-of-the-art computational methodologies. Current and prior research in this area has included fundamental algorithm development for real-time gamma-ray imaging and radionuclide identification and application of machine learning to facilitate mobile search/detection performance. The research also includes advances in simulation and modeling techniques to provide early understanding of the operational benefits of new threat detection approaches or background suppression.

- *Fundamentals of Nuclear Forensics (Forensics)* – This sub-project develops analytical techniques that can be used to determine the processing history and transit route of pre-detonation nuclear materials. Research emphasis includes identifying ways to improve analytical techniques and methodologies (e.g., speed, accuracy, and precision) for determining the physical, chemical, radiological, or morphological properties of nuclear or other radioactive materials.

- *Science and Engineering for Radiation Threat Sensing (Radiation)* – Research in this area explores radically new approaches to threat detection, eventually leading to sensor or detection system concepts that are highly sensitive to R/N signatures and selective in their ability to distinguish and locate these materials from naturally occurring background radiation. This includes research into new detection system concepts that provide new insights in how threat materials can be detected even in challenging pathways.

- *Science and Engineering of Shielded Threat Detection (Shielding)* – This research area includes investigations to overcome the challenge of detecting shielded SNM, with a focus on component technologies used in non-intrusive inspection or active interrogation approaches for cargo scanning, vehicle scanning, and human-portable scanning applications. Fundamental research in this area addresses a range of studies to augment conventional nonintrusive inspection approaches including: 1) transformational low-power, low-weight, high-yield neutron and gamma-ray producing sources; 2) high-efficiency, fast-recovery, low-cost detectors for active detection; 3) novel active interrogation inspection concepts; and 4) investigations into unique signatures and fundamental data associated with active detection methods such as nuclear resonance fluorescence.

FY 2018 Key Milestone Events

- Released a Notice of Funding Opportunity (NOFO) announcement to solicit new proposals for research, and awarded four new grants.
- Completed annual reviews of all 38 ARI grantees.
- Funded 22 research efforts at 14 universities to address long-term, high-risk challenges in R/N Detection and Forensics.
  - Completed feasibility evaluations in approaches to improve the performance of plastic scintillators through loading and conjugated polymers.

FY 2019 Planned Key Milestone Events

- N/A.

FY 2020 Planned Key Milestone Events

- N/A.

Overall Project Funding

(Dollars in Thousands)	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020
Project Funding	$11,496	$11,018	$11,964	-	-
Obligations	$9,255	$10,275	$5,009	-	-

Project Schedule

Research & Development Description	Planned Start Date	Planned Completion
FY 2018		
Methylammonium Lead Halide Semiconductors	Ongoing	FY 2021 Q4
Chalcogenide semiconductors for g-ray detection from earth abundant elements	Ongoing	FY 2019 Q4
Multimodal Data Fusion Using Low Count Spectroscopy	Ongoing	FY 2019 Q4
Threat Detection at Checkpoints Modeling	Ongoing	FY 2019 Q4
Radiological Source Detection and Tracking Based on Multi-Sensor Data Fusion	Ongoing	FY 2019 Q4
Advancement of Nuclear Forensics	Ongoing	FY 2019 Q4
Conductivity, Radiolytic Effects, and Diffusion of Interdicted Time-dependent Metallic Signatures (CREDIT)	Ongoing	FY 2019 Q4
U Materials	Ongoing	FY 2019 Q4
Machine Learning of Nuclear Forensic Data	Ongoing	FY 2019 Q4
Wearable High Resolution Radiation Detection via Flexible, Lightweight, Low-Power Nano semiconductor Composites	Ongoing	FY 2020 Q4
Investigation of Detectors, Algorithms, and Systems for Wearable Intelligent Nuclear Detection	Ongoing	FY 2020 Q4
Multi-Dimensional Neutron Source Geometries for SNM Detection	Ongoing	FY 2018 Q4
Multimodal Imaging in Active Interrogation	Ongoing	FY 2018 Q4
Investigation of Detectors, Algorithms, and Systems for Cargo Scanning	Ongoing	FY 2019 Q4
Fast Neutron Detection for Active Interrogation	Ongoing	FY 2019 Q4
Active Interrogation with superheated emulsions	Ongoing	FY 2019 Q4
Notice of Funding Opportunity for up to 7 new grants	FY 2018 Q4	FY 2023 Q4

Type of Research

Basic

Technology Readiness Level

Level 1

Transition Plans

The ARI program funds grants that are low TRL (1-3). These grants often are investigating fundamental concepts and only start to develop applications for the technology. Research executed in ARI grants helps determine the feasibility of the technology to help the mission. Those concepts and technologies that show feasibility can transition to Exploratory Research for further development, either from additional development in academia, or the commercial sector.

Small Business Innovation Research (SBIR)

The Small Business Innovation Research (SBIR) program enables technological innovation by strengthening the role of small business concerns in Federally-funded R&D. The DNDO SBIR program is specifically focused on meeting Federal research and development needs for R/N detection.

- **Problem:** The statutory purpose of the SBIR Program is to stimulate technological innovation by strengthening the role of innovative small business concerns in Federally-funded R&D.

- **Solution:** DNDO's SBIR program serves to identify, explore, develop, and demonstrate scientific and technological approaches that address gaps in the larger framework for R/N detection capabilities; significantly improve the performance of R/N detection and nuclear forensics methods, components, and systems; and/or significantly reduce the operational burden of these technologies. SBIR programs transition near-term solutions, supporting identified capability gaps, into commercial products or services.

- **Impact:** The SBIR program stimulates the technological innovation by strengthening the role of innovative small business concerns in Federally-funded R&D. The goals of the program include:
  - Stimulate technological innovation.
  - Meet Federal research and development needs.
  - Foster and encourage participation in innovation and entrepreneurship by socially and economically disadvantaged persons.
  - Increase private-sector commercialization of innovations derived from Federal research and development funding.

Under the SBIR Program, Phase I efforts are six months long and result in a feasibility evaluation. Phase II efforts are two years long and result in a Proof of Concept Demonstration.

Sub-Projects

- *Smartphone/Smart device Toolkit for Virtual and Actual Radiation Detection, Identification, and Localization*: Development and demonstration of a user-friendly and straightforward smartphone/smart device toolkit for radiation detection, identification, and localization based on the presence of a simulated or virtual radiological source.
- *Plastic Composite Based Scintillators for Multi-Signature Radiation Detectors*: Demonstration of a detector technology that combines gamma and neutron sensitivity with good efficiency at a reduced cost compared to the current commercial-off-the-shelf (COTS) scintillators.
- *Portable Linear Accelerator (Linac) for Active Interrogation Systems for Radiological Gamma Isotope Source Replacement*: Development and commercialization of a portable accelerator for detection of shielded SNM and replacement of radiological gamma isotope sources currently used for commercial non-medical applications.
- *Unattended Radiation Detection Systems*: Aims to develop a system capable of radiation detection and analysis, capturing relevant contextual information (e.g., video or pictures) from the surrounding environment, and transmitting the all relevant information, but have low-energy requirements to facilitate long periods of operation without direct operator interface.
- *Robotic Inspection for General Aviation*: Development of robotic technologies for ground based autonomous rad/nuc inspections of general

aviation aircraft. The operational environments for these technologies could be expanded to urban environment and non-containerized maritime cargo.

- *Fusion of Radiation Detectors with Large Scale Video Management Systems:* Develop software tools and associated algorithms and data analytics to support the ready integration of radiation sensors with existing security platforms and their associated video monitoring and management systems.

FY 2018 Key Milestone Events

- *Smartphone/Smart device Toolkit for Virtual and Actual Radiation Detection, Identification, and Localization:*
  - Continued one SBIR Phase II contract for further development of smart device toolkits that enable operator R/N training without a radiation source physically present. These training toolkits provide a capability to conduct R/N training at a much lower cost than training requiring the use of radiation sources.
- *Plastic Composite Based Scintillators for Multi-Signature Radiation Detectors:*
  - Continued one SBIR Phase II contract for further development of very low cost composite plastic scintillator materials capable of combined gamma, thermal neutron, and fast neutron detection for handheld and backpack applications.
- *Portable Linear Accelerator (Linac) for Active Interrogation Systems for Radiological Gamma Isotope Source Replacement:*
  - Continued one SBIR Phase II contract for further development of a compact x-ray radiation source. This source can be used in place of gamma ray emitters used in some mobile radiography systems. This source could be a longer term and lower cost solution while also reducing potential RDD threats. It could also be used for radiography in human portable applications such as on-board ships.
- *Unattended Radiation Detection Systems:*
  - Concluded three Phase I contracts leading to feasibility evaluations of unattended radiation detection systems that can be rapidly deployed and run for multiple days at a time without operator intervention while providing data fusion capabilities such as radiation detection combined with video. Approaches are being investigated with applications to unattended borders, urban search, and other areas where manpower resources are limited.
  - Initiated one Phase II contract for further development of unattended radiation detection systems.
- *Robotic Inspection for General Aviation:*
  - Initiated two new SBIR Phase I contracts for development of ground based robotic technologies for autonomous rad/nuc inspection of general aviation aircraft.
- *Fusion of Radiation Detectors with Large Scale Video Management Systems:*
  - Initiated three new SBIR Phase I contracts for development of software tools and associated algorithms and data analytics to support the ready integration of radiation sensors with existing security platforms and their associated video monitoring and management systems.

FY 2019 Planned Key Milestone Events

- N/A.

FY 2020 Planned Key Milestone Events

- N/A.

Overall Project Funding

(Dollars in Thousands)	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020
Project Funding	$3,957	$4,522	$1,939	-	-
Obligations	$3,957	$4,502	$2,546[1]	-	-

Actual amount of R&D set-aside for small business is determined in the year of execution after assessing the appropriations, and comparison of responses to DNDO's annual announcement for proposals to DNDO mission requirements.

Project Schedule

Research & Development Description	Planned Start Date	Planned Completion
FY 2018		
Phase I: Robotic Inspection for General Aviation	FY 2018 Q4	FY 2019 Q2
Phase I: Fusion of Radiation Detectors with Large Scale Video Management Systems	FY 2018 Q4	FY 2019 Q2
Phase II: Unattended Radiation Detection Systems	FY 2018 Q4	FY 2020 Q4
Phase II: Plastic Composite Based Scintillators for Multi-Signature Radiation Detectors	Ongoing	FY 2019 Q4
Phase II: Smartphone/Smart device Toolkit for Virtual and Actual Radiation Detection, Identification, and Localization	Ongoing	FY 2019 Q4
Phase II: Portable Linear Accelerator (Linac) for Active Interrogation Systems for Radiological Gamma Isotope Source Replacement	Ongoing	FY 2019 Q4

Type of Research

Developmental

Technology Readiness Level

Levels 4-7

Transition Plans

The primary objective of the SBIR program, at the whole-of-government level, is for new innovative products to reach the consumer market towards one or more identified end users (i.e. commercialization). The DNDO SBIR program also seeks projects which can meet R&D needs identified by end-users and analysts, as well as the development of components which can be integrated into larger projects like ATDs. Aspects of the technologies developed under SBIR will support and can further augment technologies of the Exploratory Research Program and Advanced Technology Demonstration program.

Detection Capability Development – PPA

Budget Comparison and Adjustments

Comparison of Budget Authority and Request

Organization (Dollars in Thousands)	FY 2018 Enacted			FY 2019 President's Budget			FY 2020 President's Budget			FY 2019 to FY 2020 Total Changes		
	Pos.	FTE	Amount	Pos.	FTE	Amount	Pos.	FTE	Amount	Pos.	FTE	Amount
Detection Capability Development	-	-	$15,155	-	-	-	-	-	-	-	-	-
Total	**-**	**-**	**$15,155**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Subtotal Discretionary - Appropriation	-	-	$15,155	-	-	-	-	-	-	-	-	-

PPA Level I Description

With the transfer of the functions of DNDO to CWMD, no funds are included in either the FY 2019 President's Budget or the FY 2020 President's Budget for DNDO's Detection Capability Development PPA. Funding for the programs previously supported through this PPA are discussed in CWMD's Research and Development appropriation.

The Detection Capability Development PPA incorporates the user requirements of DHS's operational components into R/N detection systems. It achieves this by coordinating its integrated lifecycle management and systems engineering lifecycle activities with the end-user community and managing the task execution of DNDO's Solution Development Process.

Recognizing that innovation can originate in a variety of sectors, DNDO utilizes a commercial first approach that gives preference for solutions available in the private sector marketplace. Using this approach, DNDO can leverage industry-led innovations and developments, resorting to a Federally-sponsored and managed development and acquisition process when no commercial solution is feasible or private industry chooses not to commercialize a product.

Detection Capability Development – PPA
Budget Authority and Obligations

Budget Authority *(Dollars in Thousands)*	**FY 2018**	**FY 2019**	**FY 2020**
Enacted/Request	**$15,155**	**-**	**-**
Carryover and/or Recoveries (Actual/Estimates/Projections)	$5,817	-	-
Rescissions to Current Year/Budget Year	-	-	-
Net Sequestered Resources	-	-	-
Reprogrammings/Transfers	$1,100	-	-
Supplementals	-	-	-
Total Budget Authority	**$22,072**	**-**	**-**
Collections – Reimbursable Resources	$1	-	-
Total Budget Resources	**$22,073**	**-**	**-**
Obligations (Actual/Estimates/Projections)	$12,739	-	-
Personnel: Positions and FTE			
Enacted/Request Positions	-	-	-
Enacted/Request FTE	-	-	-
Onboard and Actual FTE; Includes Collections - Reimbursable Resources			
Onboard (Actual/Estimates/Projections)	-	-	-
FTE (Actual/Estimates/Projections)	-	-	-

Detection Capability Development – PPA
Summary of Budget Changes

Budget Formulation Activity *(Dollars in Thousands)*	Positions	FTE	Amount
FY 2018 Enacted	-	-	**$15,155**
FY 2019 President's Budget	-	-	-
FY 2020 Base Budget	-	-	-
FY 2020 Request	-	-	-
FY 2019 To FY 2020 Change	-	-	-

Detection Capability Development – PPA
Non Pay Budget Exhibits

Non Pay Summary

Organization *(Dollars in Thousands)*	**FY 2018 Enacted**	**FY 2019 President's Budget**	**FY 2020 President's Budget**	**FY 2019 to FY 2020 Total Changes**
Detection Capability Development	$15,155	-	-	-
Total	**$15,155**	**-**	**-**	**-**
Discretionary - Appropriation	$15,155	-	-	-

Non Pay by Object Class

Non-Pay Object Classes *(Dollars in Thousands)*	**FY 2018 Enacted**	**FY 2019 President's Budget**	**FY 2020 President's Budget**	**FY 2019 to FY 2020 Change**
21.0 Travel and Transportation of Persons	$21	-	-	-
25.1 Advisory and Assistance Services	$7,129	-	-	-
25.3 Other Goods and Services from Federal Sources	$8,005	-	-	-
Total - Non Pay Object Classes	**$15,155**	**-**	**-**	**-**

Non Pay Cost Drivers

Leading Non Pay Cost-Drivers *Dollars in Thousands*	**FY 2018 Enacted**	**FY 2019 President's Budget**	**FY 2020 President's Budget**	**FY 2019 to FY 2020 Total Changes**
He3 Alternative Implementation Backpack Program (HAIBP)	$1,980			
RPM Open Systems Architecture	$3,808			
International Rail	$3,009			
Common Viewer	$3,240			
SIGMA	$625			
Other Costs	$2,493			
Total Non Pay Cost Drivers	**$15,155**			

Explanation of Non Pay Cost Drivers

Helium^3 Alternative Implementation Backpack (HAIBP) Program: The HAIBP Program expands the capability of backpack R/N detection systems to include isotope identification. The HAIBP program objective is to field a wearable R/N detector system with expansion capability to perform identification to meet the wide-area search mission. No funds are planned in FY 2019 or FY 2020 because of the transfer of DNDO functions to CWMD.

Radiation Portal Monitor Open Systems Architecture (ROSA) Program: The ROSA program is a follow-on to the Radiation Portal Monitor Replacement Program (RPM RP). The ROSA program, previously referred to as RPM RP Program 1, will explore an open systems architecture model as an option to recapitalize the remainder of the legacy RPM fleet beyond the 200 units planned under RPM RP. ROSA will be modular with a defined a set of hardware and software interfaces that enable assembly of an RPM from a set of commercial-off-the-shelf (COTS) components. An open systems approach will allow for more agile technology insertion and reduced sustainment costs. In FY 2018, ROSA development efforts were funded under the RPM Replacement Program. No funds are planned in FY 2019 or FY 2020 because of the transfer of DNDO functions to CWMD.

International Rail (IRAIL) Program: The IRAIL program is a program with the objective to identify and detect R/N material entering the United States via freight rail. The program is managed in coordination with the CBP Non-Intrusive Inspection (NII) Program which is recapitalizing aging NII systems at rail POEs. This program also includes the development of a capability that integrates different sensor types, such as Non-Intrusive Inspection (NII) and RDE, which can be applied to other pathways as well, and which will improve CBP Officer efficiencies and support data analytics. No funds are planned in FY 2019 or FY 2020 because of the transfer of DNDO functions to CWMD.

Common Viewer Program: The Common Viewer subproject is intended to provide a single user interface for Customs and Border Protection (CBP) personnel to access and control various systems (e.g., radiation detection equipment (RDE), non-intrusive inspection (NII) systems, ancillary control

systems) simultaneously, allowing both CBP officers "on the ground" and staff at the National Targeting Center and CBP remote operations / analysis centers to check real-time radiographic, spectrographic, optical, and x-ray imaging data against traveler, cargo, and conveyance information for comparison against law enforcement, intelligence, and other enforcement data.

SIGMA: SIGMA is a cost-effective, operationally practical, continuous and ubiquitous R/N detection capability. Includes low cost radiation detectors with spectroscopic gamma and neutron sensing capability, packaged as automated and networked threat detection and identification capability with web-based command and control. No funds are planned in FY 2019 or FY 2020 because of the transfer of DNDO functions to CWMD.

Other Costs: Reflects funding for other Detection Capability Detection efforts including Maritime Non-Containerized Cargo (MNCC) Program, On Dock Rail, Algorithm Improvement, and Polyvinyl Toluene (PVT) solution development.

Detection Capability Development – PPA
Research and Development

Technology Readiness Level Exhibit

Detection Capability Development Program

Project Description

The Detection Capability Development Program incorporates the user requirements of DHS's operational Components into R/N detection systems. It achieves this by coordinating its integrated lifecycle management and systems engineering lifecycle activities with the end-user community and managing the task execution of DNDO's SDP.

Recognizing that innovation can originate in a variety of sectors, DNDO has adopted a "commercial first" approach that gives preference for solutions available in the private sector marketplace. Using this approach, DNDO can leverage industry-led innovations and developments, resorting to a Federally-sponsored and managed development and acquisition process when no commercial solution is feasible or private industry chooses not to commercialize a product.

Sub-Projects

- *Helium^3 Alternative Implementation Backpack (HAIBP)***:** The HAIBP Program expands the capability of backpack R/N detection systems to include isotope identification. The HAIBP program objective is to field a wearable R/N detector system with expansion capability to perform identification to meet the wide-area search mission.
- *Radiation Portal Monitor Open Systems Architecture (ROSA)*: The ROSA a program is a follow-on to the Radiation Portal Monitor Replacement Program (RPM RP). The ROSA program, previously referred to as RPM RP Program 1, will explore an open systems architecture model as an option to recapitalize the remainder of the legacy RPM fleet beyond the approximately 200 units planned under RPM RP. ROSA will be modular with a defined a set of hardware and software interfaces that enable assembly of an RPM from a set of commercial-off-the-shelf (COTS) components. An open systems approach will allow for more agile technology insertion and reduced sustainment costs.
- *International Rail (IRAIL):* The IRAIL Program is a program identifying and detecting R/N material entering the United States via freight rail. The program is managed in coordination with the CBP Non-Intrusive Inspection (NII) Program which is recapitalizing aging NII systems at rail POEs. Currently, limited R/N scanning of freight rail cargo exists at rail crossings at U.S. international POEs. Existing NII technology to address these threats is approaching the end of its useful service life; the addition of passive radiation detection equipment will improve R/N threat detection.
- *Common Viewer*: The Common Viewer subproject is intended to provide a single user interface for Customs and Border Protection (CBP) personnel to access and control various systems (e.g., radiation detection equipment (RDE), non-intrusive inspection (NII) systems, ancillary control systems) simultaneously, allowing both CBP officers "on the ground" and staff at the National Targeting Center and CBP remote

operations / analysis centers to check real-time radiographic, spectrographic, optical, and x-ray imaging data against traveler, cargo, and conveyance information for comparison against law enforcement, intelligence, and other enforcement data.

- *SIGMA:* SIGMA is a cost-effective, operationally practical, continuous and ubiquitous R/N detection capability. Current gamma and neutron human portable R/N detectors do not feed into an automated detector network capable of wide-area monitoring. SIGMA provides low cost radiation detectors with spectroscopic gamma and neutron sensing capability, packaged as automated and networked threat detection and identification capability with web-based command and control.
- *Maritime Non-Containerized Cargo (MNCC) Program*: The MNCC Program is a program with the objective to provide efficient and effective scanning of the most diverse cargo types – break bulk cargo (transported unpackaged in large quantities) and roll-on, roll-off (vehicles, bags, bundles, crates, loose materiel, and containerized liquid) – for R/N material entering the United States at sea POEs. When break bulk cargo is off loaded from ships, CBP Officers scan it for R/N material, often using hand held devices. This capability is not suitable for the high volume of cargo being offloaded at U.S. ports and has been identified as an area for risk reduction. The MNCC program will conduct analysis to identify materiel, non-materiel, or combined solutions that will reduce the risk of R/N material being offloaded at U.S. ports, and inside break bulk cargo not being detected.

FY 2018 Key Milestone Events

- RPM RP Program 1 (ROSA): Conducted market research (e.g., Request for Information and Industry Day) and began testing key interfaces.
- MNCC: Initiated and executed an Analysis of Alternatives.

FY 2019 Planned Key Milestone Events

- HAIBP: Conduct Rapid Deployment and Characterization Testing.
- MNCC: Completion of Analysis of Alternatives.

FY 2020 Planned Key Milestone Events

- N/A.

Overall Project Funding

(Dollars in Thousands)	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020
Project Funding	$21,029	$19,581	$15,155	-	-
Obligations	$18,461	$14,880	$7,388	-	-

Project Schedule

Research & Development Description	Planned Start Date	Planned Completion
FY 2018		
3He Alternative Implementation Backpack (HAIBP) Program	FY 2018	FY 2019
Radiation Portal Monitor Replacement Program (RPM RP) Program 1 (ROSA)	Ongoing	FY 2021
International Rail (IRAIL) Program	Ongoing	FY 2020
Common Viewer	FY 2019	FY 2020
Maritime Non-Containerized Cargo (MNCC) Program	FY 2018	FY 2021

**Project Schedule reflects planned completion of R&D effort.*

Type of Research

Developmental.

Technology Readiness Level

5-7.

Transition Plans

The detection capabilities under these programs will be transitioned to DHS Operational Component(s) (CBP, USCG, TSA, etc.) after test and evaluation to ensure they meet operational requirements, and an operational readiness review is conducted with the DHS operational component(s) deploying the capability. Post-implementation Review activities are conducted after the initial deployed units have been in operational use for 12 to 18 months to provide the necessary information to determine the degree to which a materiel investment operating in its intended environment has met the needed capability.

Throughout the life of the capability, CWMD works collaboratively with the DHS operational components to manage the equipment configuration to ensure it continues to meets its operational requirements, as well as collect and analyze operational performance and maintenance data to maximize performance per maintenance dollar and inform future procurement requirements.

The IRAIL program and the Common Viewer prototype effort are anticipated to transition to acquisition and deployment programs in FY 2020.

Detection Capability Assessments – PPA

Budget Comparison and Adjustments

Comparison of Budget Authority and Request

Organization (Dollars in Thousands)	FY 2018 Enacted			FY 2019 President's Budget			FY 2020 President's Budget			FY 2019 to FY 2020 Total Changes		
	Pos.	FTE	Amount	Pos.	FTE	Amount	Pos.	FTE	Amount	Pos.	FTE	Amount
Detection Capability Assessments	-	-	$34,127	-	-	-	-	-	-	-	-	-
Total	**-**	**-**	**$34,127**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Subtotal Discretionary - Appropriation	-	-	$34,127	-	-	-	-	-	-	-	-	-

PPA Level I Description

With the transfer of the functions of DNDO to CWMD, no funds are included in either the FY 2019 President's Budget or the FY 2020 President's Budget for DNDO's Detection Capability Assessments PPA.

The Detection Capability Assessment PPA, supports the development and acquisition process for mission-related technologies. DNDO continually assesses R/N detection capabilities through a variety of means, including test and evaluation (T&E) campaigns to characterize and collect performance data on commercially available and emerging technologies and systems.

Rigorous and scientifically defensible testing requires a team of trained and experienced subject matter experts, including nuclear physicists, statisticians, analysts, and testers. While T&E campaigns evaluate systems under development, the Red Team (RT) Project evaluates deployed systems and operations and their associated tactics, techniques, and procedures, in as-close-to-realistic-environments as possible. The RT Project presents adversary tactics and radiological signature training devices to Federal and SLTT (FSLTT) R/N detection and interdiction operations. These presentations can either be covert or overt in nature. DNDO Program Assessments project performs objective reviews of the effectiveness of R/N detection capabilities and their associated activities by examining programs, CONOPS, protocols, policies, procedures, and training.

Detection Capability Assessment – PPA
Budget Authority and Obligations

Budget Authority *(Dollars in Thousands)*	**FY 2018**	**FY 2019**	**FY 2020**
Enacted/Request	**$34,127**	**-**	**-**
Carryover and/or Recoveries (Actual/Estimates/Projections)	$3,383	-	-
Rescissions to Current Year/Budget Year	-	-	-
Net Sequestered Resources	-	-	-
Reprogrammings/Transfers	($1,815)	-	-
Supplementals	-	-	-
Total Budget Authority	**$35,695**	**-**	**-**
Collections – Reimbursable Resources	-	-	-
Total Budget Resources	**$35,695**	**-**	**-**
Obligations (Actual/Estimates/Projections)	$17,010	-	-
Personnel: Positions and FTE			
Enacted/Request Positions	-	-	-
Enacted/Request FTE	-	-	-
Onboard and Actual FTE; Includes Collections - Reimbursable Resources			
Onboard (Actual/Estimates/Projections)	-	-	-
FTE (Actual/Estimates/Projections)	-	-	-

Detection Capability Assessment – PPA
Summary of Budget Changes

Budget Formulation Activity *(Dollars in Thousands)*	Positions	FTE	Amount
FY 2018 Enacted	-	-	**$34,127**
FY 2019 President's Budget	-	-	-
FY 2020 Base Budget	-	-	-
FY 2020 Request	-	-	-
FY 2019 To FY 2020 Change	-	-	-

Detection Capability Assessment – PPA
Non Pay Budget Exhibits

Non Pay Summary

Organization *(Dollars in Thousands)*	**FY 2018 Enacted**	**FY 2019 President's Budget**	**FY 2020 President's Budget**	**FY 2019 to FY 2020 Total Changes**
Detection Capability Assessments	$34,127	-	-	-
Total	**$34,127**	**-**	**-**	**-**
Discretionary - Appropriation	$34,127	-	-	-

Non Pay by Object Class

Non-Pay Object Classes *(Dollars in Thousands)*	**FY 2018 Enacted**	**FY 2019 President's Budget**	**FY 2020 President's Budget**	**FY 2019 to FY 2020 Change**
21.0 Travel and Transportation of Persons	$382	-	-	-
25.1 Advisory and Assistance Services	$14,173	-	-	-
25.3 Other Goods and Services from Federal Sources	$19,572	-	-	-
Total - Non Pay Object Classes	**$34,127**	**-**	**-**	**-**

Non Pay Cost Drivers

Leading Non Pay Cost-Drivers *Dollars in Thousands*	FY 2018 Enacted	FY 2019 President's Budget	FY 2020 President's Budget	FY 2019 to FY 2020 Total Changes
Operational Readiness Assessment	$9,868			
Test & Evaluation Program	$24,259			
Total – Non Pay Cost Drivers	**$34,127**			

Explanation of Non Pay Cost Drivers

Operational Readiness Assessment: DNDO's primary means to objectively assess the operational effectiveness and performance the deployed R/N detection capabilities at the FSLTT levels in support of the front-line operators.

Test and Evaluation Program: Plan and execute tests and evaluations to provide critical information on the technical and operational capabilities and limitations of our detection technologies, acquisition decisions, and facilitate the development of standards and requirements

Detection Capability Assessment – PPA
Research and Development

Technology Readiness Level Exhibit

Test, Evaluation, and Analysis

Project Description

The DNDO research, development, and acquisition process is anchored by rigorous assessments of mission-related technologies as they are developed, deployed, and implemented. These programs are supported by the Test, Evaluation, and Analysis Program (T&E) campaigns to characterize, verify, and validate technical performance and assess the operational effectiveness and suitability of technologies under development, as well as that of commercially available systems prior to deployment (full operational capability). DNDO utilizes a suite of test instrumentation and automated data collection systems to enable testing teams to rapidly verify and validate data. The Standards project follows a cycle of development, use, and revision of consensus and technical capability standards to ensure that each standard remains effective for the assessment of R/N detection technology.

- **Problem:** Support DNDO's focus on preventing nuclear terrorism by assuring that detection equipment and systems meet specific requirements and standards.

- **Solution:** Plan and execute tests and evaluations to provide critical information on the technical and operational capabilities and limitations of our detection technologies, acquisition decisions, and facilitate the development of standards and requirements.

- **Impact:** These tests and evaluations provide critical information on the effectiveness of detection technologies used to prevent nuclear terrorism.

Sub-Projects

- *T&E Operations:* The sub-project funds the staff resources necessary to independently plan test activities, ensure scientific defensibility and rigor, oversee test execution, and report results.
- *Operational Analysis and Technical Assessments (OATA):* The OATA sub-project provides the subject matter experts that conduct technical assessments. The activities and products produced from this effort will transform data collected during assessments into actionable knowledge of R/N detectors under acquisition consideration. The OATA Project has four main elements: Tools for Test Data Management; Spectral Data and Algorithm Analysis Tools; Test Modeling and Simulation; and Technical Assessment. The OATA sub-project is executed through the DNDO Data Mining, Analysis, and Modeling Cell (DMAMC). In addition, lessons learned are captured and documented to preserve and share institutional knowledge among key stakeholders to reduce costs, risks and improve efficiencies and performance.
- *Directed Test:* Through the Directed Test sub-project, DNDO conducts test campaigns using mature, commercially available R/N detection systems in operational scenarios faced by FSLTT front-line operators. These Directed Tests produce independent assessments of equipment to confirm vendor performance claims and can help with development and/or refinement of the front-line operator CONOPS and can help identify

training needs.

- *Standards and Conformity Testing:* The sub-project includes work on national and international consensus standards, development of technical capability standards, and standards validation. Conformity assessments are a systematic examination of the extent to which an R/N detection system conforms to specified standards. Such conformity assessments require testing facilities that can reliably test equipment against the standards.
- *Sources and Infrastructure:* The sub-project provides oversight for the R/N Countermeasures Test and Evaluation Center (RNCTEC) test venue and the design, fabrication, and management of radiation signature training devices and radioactive sources to support the Test and Evaluation Program.

FY 2018 Key Milestone Events

- Supported the revision of the *ANSI N42.48* American National Standard Performance standards for Spectroscopic Personal Radiation Detectors (SPRDs). It was published on February 1, 2019.
- Continued to dispose of obsolete testing equipment at RNCTEC.
- Received approval to excess and dispose of obsolete test equipment at SRNL.
- Initiated planning for 20 test events.
- Completed test execution for 12 test events.
- Completed 13 results briefings (MS-5A) and three test reports (MS-5B).
- Assembled, characterized one source kit.
- Continued building interconnections between Report Analysis and Archive System and the DMAMC Lexicon, Modeling Catalog and Instruments Catalog and add ability to search and filter uploaded documents and improve aggregate views of data, to be completed in FY 2019.
- Continued development of the Radiological and Nuclear Data Repository in FY 2018 to illuminate areas that yield opportunities for T&E process improvements and efficiencies, to be completed in FY 2019.
- Sustained DMAMC data analysis capability, which has responded to more than 100 major technical and scientific requests for information and analysis.
- Completed summary reports for all RDE technology categories currently deployed in the MDDU.
- Deployed the DMAMC SME network management system.

FY 2019 Planned Key Milestone Events

- N/A.

FY 2020 Planned Key Milestone Events

- N/A.

Overall Project Funding

(Dollars in Thousands)	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020
Project Funding	$26,828	$30,471	$24,259	-	-
Obligations	$21,435	$29,215	$6,014	-	-

Project Schedule

Research & Development Description	Planned Start Date	Planned Completion
FY 2018		
Completed IT upgrades at RNCTEC.	FY 2018 Q1	FY 2018 Q4
Designed two radiological source kits to support normalization testing	FY 2018 Q1	FY 2019 Q3
Executed the COTS Vehicle-Mounted Mobile Systems "Honey Badger" Directed Test (Phase 1) in support of Federal, State, local and tribal partners	FY 2018 Q1	FY 2018 Q1
Planned the Robotics R/N Detection Directed Test	FY 2018 Q3	FY 2018 Q4
Performed ODR SCP Performance Test	FY 2018 Q1	FY 2018 Q1
Completed 12 developmental/operational test events	FY 2018 Q1	FY 2018 Q4

Type of Research

N/A.

Technology Readiness Level

N/A.

Transition Plans

N/A.

Operational Readiness Assessment (ORA)

The Operational Readiness Assessment (ORA) Program is DNDO's primary means to objectively assess the operational effectiveness and performance the deployed R/N detection capabilities at the FSLTT levels in support of the front-line operators. ORA also assesses the effectiveness of DNDO programs in support of the front-line operators.

- **Problem:** Objectively assess the operational effectiveness and performance of deployed R/N detection capabilities at the FSLTT levels in support of the front-line operators.

- **Solution:** Evaluate deployed systems and operations and their associated tactics, techniques and procedures, in as-close-to-realistic environments as possible.

- **Impact:** These assessments provide objective findings and recommendations to improve the effectiveness and performance of front-line operators.

Sub-Projects

- *Program Assessments (PA):* Performs objective reviews of the effectiveness of R/N capabilities and their associated activities by examining R/N detection programs, CONOPS, protocols, policies, procedures, and training. PA conducts assessments that provide insights on what is successfully being accomplished and identifies areas for improvement. These assessments are conducted to provide objective findings and recommendations and establish a documented baseline to provide a historic perspective for future endeavors.
- *Red Team (RT):* Fulfills a mission need to evaluate deployed systems and operations and their associated tactics, techniques and procedures, in as-close-to-realistic environments as possible. The RT Project presents adversary tactics and radiological signature training devices to FSLTT R/N detection and interdiction operations. These presentations can either be covert or overt in nature. RT identifies gaps and vulnerabilities in deployed systems, provides recommendations to mitigate them, and conducts analysis across multiple assessments to identify issues systemic to the DNDO mission to prevent nuclear terrorism. The desired outcome improves our Nation's capability to detect and defeat a radiological or nuclear attack on the homeland over time.

FY 2018 Key Milestone Events

- Completed two (2) program assessments: Threat Response Operation and Technology Transition Assessment.
- Completed one (1) self-assessment: Meta-evaluation: Trends and Recurring Issues.
- Initiated an Acquisition and Customer Needs Assessments.
- Conducted 39 Red Team events in FY 2018.

Overall Project Funding

(Dollars in Thousands)	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020
Project Funding	$12,675	$8,801	$9,868	-	-
Obligations	$10,256	$8,770	$3,898	-	-

Project Schedule

Research & Development Description	Planned Start Date	Planned Completion
FY 2018		
Program Assessments	FY 2018 Q1	FY 2018 Q4
Red Team	FY 2018 Q1	FY 2018 Q4

Type of Research

N/A.

Technology Readiness Level

N/A.

Transition Plans

N/A.

Nuclear Forensics – PPA

Budget Comparison and Adjustments

Comparison of Budget Authority and Request

Organization (Dollars in Thousands)	FY 2018 Enacted			FY 2019 President's Budget			FY 2020 President's Budget			FY 2019 to FY 2020 Total Changes		
	Pos.	FTE	Amount	Pos.	FTE	Amount	Pos.	FTE	Amount	Pos.	FTE	Amount
Nuclear Forensics	-	-	$18,361	-	-	-	-	-	-	-	-	-
Total	**-**	**-**	**$18,361**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Subtotal Discretionary - Appropriation	-	-	$18,361	-	-	-	-	-	-	-	-	-

PPA Level I Description

With the transfer of the functions of DNDO to CWMD, no funds are included in either the FY 2019 President's Budget or the FY 2020 President's Budget for DNDO's Nuclear Forensics PPA.

The Nuclear Forensics PPA advances the science of nuclear forensics - the examination of materials recovered from R/N events of an illicit or hostile nature in order to determine their character and origin in the context of legal proceedings or national security. Together, the GNDA and nuclear forensics efforts strengthen the detection of nuclear or other radioactive materials that are out of regulatory control;[1] enable the identification and closure of illicit R/N trafficking networks; promote nuclear security; and deter potential adversaries by increasing their perceived and actual risk of failure and the prospect of being held accountable for planned or attempted attacks. This PPA includes the National Technical Nuclear Forensics Center (NTNFC), which through its operational readiness, technology advancement, and expertise development missions, provides centralized planning, integration and advancement of USG nuclear forensics capabilities while leading the interagency implementation of the *National Strategic Five-Year Plan for Improving the Nuclear Forensics and Attribution Capabilities of the United States (FY 2015-2019).*

The Nuclear Forensics Program is organized into three mission areas: Operational Readiness, Technology Advancement, and Expertise Development. DNDO programs and activities focused on nuclear forensics are also aligned with the goals and investment priorities delineated in the *National Strategic Five-Year Plan for Improving the Nuclear Forensics and Attribution Capabilities of the United States (FY 2015-2019).*

[1] The term "out of regulatory control" refers to materials that are being imported, possessed, stored, transported, developed, or used without authorization of the appropriate regulatory authority, either inadvertently or deliberately.

Nuclear Forensics – PPA
Budget Authority and Obligations

Budget Authority *(Dollars in Thousands)*	**FY 2018**	**FY 2019**	**FY 2020**
Enacted/Request	**$18,361**	**-**	**-**
Carryover and/or Recoveries (Actual/Estimates/Projections)	$1,720	-	-
Rescissions to Current Year/Budget Year	-	-	-
Net Sequestered Resources	-	-	-
Reprogrammings/Transfers	($1,376)	-	-
Supplementals	-	-	-
Total Budget Authority	**$18,705**	**-**	**-**
Collections – Reimbursable Resources	-	-	-
Total Budget Resources	**$18,705**	**-**	**-**
Obligations (Actual/Estimates/Projections)	$8,683	-	-
Personnel: Positions and FTE			
Enacted/Request Positions	-	-	-
Enacted/Request FTE	-	-	-
Onboard and Actual FTE; Includes Collections - Reimbursable Resources			
Onboard (Actual/Estimates/Projections)	-	-	-
FTE (Actual/Estimates/Projections)	-	-	-

Nuclear Forensics – PPA
Summary of Budget Changes

Budget Formulation Activity *(Dollars in Thousands)*	Positions	FTE	Amount
FY 2018 Enacted	-	-	**$18,361**
FY 2019 President's Budget	-	-	-
FY 2020 Base Budget	-	-	-
FY 2020 Request	-	-	-
FY 2019 To FY 2020 Change	-	-	-

Nuclear Forensics – PPA
Non Pay Budget Exhibits

Non Pay Summary

Organization *(Dollars in Thousands)*	**FY 2018 Enacted**	**FY 2019 President's Budget**	**FY 2020 President's Budget**	**FY 2019 to FY 2020 Total Changes**
Nuclear Forensics	$18,361	-	-	-
Total	**$18,361**	**-**	**-**	**-**
Discretionary - Appropriation	$18,361	-	-	-

Non Pay by Object Class

Non-Pay Object Classes *(Dollars in Thousands)*	**FY 2018 Enacted**	**FY 2019 President's Budget**	**FY 2020 President's Budget**	**FY 2019 to FY 2020 Change**
21.0 Travel and Transportation of Persons	$110	-	-	-
25.1 Advisory and Assistance Services	$2,563	-	-	-
25.3 Other Goods and Services from Federal Sources	$13,219	-	-	-
25.5 Research and Development Contracts	$1,819	-	-	-
41.0 Grants, Subsidies, and Contributions	$650	-	-	-
Total - Non Pay Object Classes	**$18,361**	**-**	**-**	**-**

Non Pay Cost Drivers

Leading Non Pay Cost-Drivers *Dollars in Thousands*	**FY 2018 Enacted**	**FY 2019 President's Budget**	**FY 2020 President's Budget**	**FY 2019 to FY 2020 Total Changes**
Operational Readiness	$3,970			
Technology Advancement	$9,152			
Expertise Development	$5,239			
Total – Non Pay Cost Drivers	**$18,361**			

Explanation of Non Pay Cost Drivers

Operational Readiness: DNDO ensures readiness through joint planning, exercises, assessments, and promoting international engagements. Along with supporting attribution, the USG readiness posture helps to deter sponsors of terrorists. No funds are planned in FY 2019 or FY 2020 because of the transfer of DNDO functions to CWMD.

Technology Advancement: DNDO leads activities that advance the USG capability to rapidly, accurately, and credibly characterize and identify the nature, origin, and history of nuclear materials interdicted before a detonation. No funds are planned in FY 2019 or FY 2020 because of the transfer of DNDO functions to CWMD.

Expertise Development: DNDO sustains a preeminent workforce of scientists educated and trained in nuclear forensics-related specialties. As described in the *Nuclear Forensics and Attribution Act (P.L. 111-140)*, the "National Nuclear Forensics Expertise Development Program" maintains technical expertise through support to graduate and undergraduate students, faculty, and scientific staff at the DOD and DOE laboratories. No funds are planned in FY 2019 or FY 2020 because of the transfer of DNDO functions to CWMD.

Nuclear Forensics – PPA
Research and Development

Technology Readiness Level Exhibit

Operational Readiness

Project Description

Through the Operational Readiness Project, DNDO, as the USG National Technical Nuclear Forensics (NTNF) program integrator, provides centralized planning, evaluation, and stewardship of nuclear forensics capabilities through interagency coordination and integration; international collaboration; and leading the coordination of joint exercises, assessments, and corrective actions. DNDO leads the development of foundational documents that establish interagency strategic goals, objectives, requirements, processes, plans, and operational procedures for the NTNF mission. DNDO sponsors and leads assessments to evaluate these efforts and improve the Nuclear Forensics capability across the mission spectrum from pre- to post-detonation, both within the United States and abroad. DNDO also coordinates partner agency programs to facilitate alignment and eliminate duplication. Another key component of ensuring operational readiness is the conduct of regular, rigorous nuclear forensics exercises. Such exercises assess multiagency integration, readiness, field sampling techniques, laboratory analysis, data evaluation and reporting, and communication flow during a planned to actual R/N attack. The major exercises alternate between pre- and post-detonation scenarios involving nuclear materials. These exercises focus on the continuous improvement of operations across the NTNF community. Exploring the technical and operational shortcomings and gaps enable DNDO and its partners to identify corrective actions based on after-action reports and lessons learned.

- **Problem:** The need to maintain and advance the operational readiness of the USG technical nuclear forensics capabilities in order to deter, prevent, and respond to planned or actual R/N attacks.

- **Solution:** Coordination and integration of nuclear forensics activities for the USG, including interagency program planning from the strategic to tactical level. Also included is the continual evaluation of the technical nuclear forensics capability through assessments and analyses, increasingly rigorous and realistic exercises, promoting international collaboration to advance global nuclear forensics capabilities, and facilitating NTNF strategic communications to support deterrence of R/N smuggling or attacks.

- **Impact:** A ready, robust, enduring, and publicized technical nuclear forensics capability.

Sub-Projects

- *Assessments and Analysis:* The Assessments and Analysis sub-project strengthens nuclear forensics capability through regular evaluations and assesses processes and capabilities to ensure readiness and to identify lessons learned, best practices, strengths, and areas needing improvement. An important aspect of the Assessments and Analysis Project is the Nuclear Forensics Science Panel (NFSP). The NFSP comprises experts in technical fields with relevance to nuclear forensics, such as nuclear weapons design and testing, analytical and radiochemistry, statistics, nuclear production processes, and modeling and simulation of nuclear processes. At the request of the DNDO and interagency partners, the NFSP

assesses various aspects of NTNF and answers technical questions that may guide future operational or R&D activities.

- *Centralized Planning:* The Centralized Planning sub-project conducts efficient interagency program planning and integration of respective agency nuclear forensics capabilities and resources. This involves working closely with partners across six departments and agencies – as well as the White House – to effectively coordinate and align USG technical capabilities and operational activities while leveraging interagency investment in R&D in order to address priority needs and ensure unity of effort. DNDO accomplishes this integration through its leadership of the Nuclear Forensics Executive Council, NTNF Steering Committee, and issue-specific working groups.
- *Exercises:* The Exercises sub-project strengthens and assesses nuclear forensics capability through jointly planned and executed exercises across the entire nuclear forensics mission space and are inclusive of all partner agencies across the USG. Well-documented lessons learned and a robust corrective actions program play a significant role in improving the collective nuclear forensics capabilities and future exercise planning and execution. This includes the conduct of rigorous full-scale interagency exercises to rehearse, evaluate, identify gaps, and improve the nuclear forensics capabilities.
- *International Engagements*: The International Engagements sub-project facilitates multilateral and bilateral collaborations in a strategic, cost-effective manner that supports the USG national objective to advance international nuclear forensics capabilities and build foreign partner capacity. DNDO activity in this area involves subject-matter expert contributions to multilateral initiatives and organizations, such as the, GICNT, IAEA, and the Nuclear Forensics International Technical Working Group (ITWG), to develop key technical and policy-oriented guidance documents that are based upon best practices. Bilateral work features direct collaboration between DNDO and foreign governments on pre-detonation nuclear forensics and related technical projects. These activities are prioritized based on the DNDO's R&D interests and the concurrent benefits of building relationships and strengthening partner nations' capabilities.

FY 2018 Key Milestone Events

- Led the development of the *Joint Interagency Annual Review* of the *National Strategic Five-Year Plan* and continued to enhance interagency coordination through leadership of the NTNF Steering Committee, Executive Council, and issue-specific working groups.
- Continued to partner with the Kingdom of Sweden and the United Kingdom on nuclear forensics certified reference material production and evaluation.
- Supported the development of the draft interagency post detonation Technical Nuclear Forensics (TNF) Concept of Operations (CONOPs) and the development and planning of an operational exercise, in close coordination with NTNF partners, to test the newly codified WMD Attribution Framework (WAF), WAF Implementation Plan, and post detonation TNF CONOPS in FY 2019.
- Coordinated the planning and execution of two post-detonation collections exercises.

FY 2019 Planned Key Milestone Events

- N/A.

FY 2020 Planned Key Milestone Events

- N/A.

Overall Project Funding

(Dollars in Thousands)	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020
Project Funding	$4,317	$3,727	$3,970	-	-
Obligations	$4,015	$3,317	$2,019	-	-

Project Schedule

Research & Development Description	Planned Start Date	Planned Completion
FY 2018		
Interagency coordination	FY 2018 Q1	Ongoing
International Engagements (bilateral and multilateral initiatives)	FY 2018 Q1	Ongoing
Coordinate/plan pre/post-detonation exercise	FY 2018 Q1	FY 2018 Q4

Type of Research

Operational readiness supports technology development by exercising operational capabilities and assists in identifying gaps for future development efforts. Operational readiness also supports operational testing of technologies under development to ensure technologies can perform under operational conditions.

Technology Readiness Level

Levels 5-7.

Transition Plans

Technologies developed will be operationally tested under realistic conditions resulting in stakeholder buy-in and adoption by operational community.

DNDO's Nuclear Forensics R&D efforts are informed by high level policy guidance, legislation, and pre-eminent scientific expertise, included in National Security/Homeland Security Policy Directives, the *Joint Interagency Annual Review* of the President's *National Strategic Five-Year Plan for Improving the Nuclear Forensics and Attribution Capabilities of the U.S.*, the 2010 *Nuclear Forensics and Attribution Act*[2], and the 2010 National Academy of Sciences Report, *Nuclear Forensics: A Capability at Risk*. Our R&D efforts support our operational partners' needs and capabilities, help maintain a viable workforce, and focus the efforts of our students and universities, all of which is connected to a strong exercise program.

[2] https://www.congress.gov/111/plaws/publ140/PLAW-111publ140.pdf

Technology Advancement Project

DNDO, through the Technology Advancement Project, leads activities that advance the USG capability to rapidly, accurately, and credibly characterize and identify the nature, origin, and history of nuclear materials interdicted before a detonation. These techniques allow experts to reach technical conclusions about interdicted material based on known signatures, comparative samples of materials, and modeling of manufacturing processes to support attribution assessments for decision makers. The Technology Advancement Project benchmarks and advances forensics methodologies to provide results with well-understood uncertainties and develops signatures and data evaluation tools to support attribution assessments. In addressing the pre-detonation materials forensics capability development mission, the Technology Advancement Project provides advanced operational capability to the Bulk Special Nuclear Material Analysis Program (BSAP). BSAP is an interagency program coordinated by the National Nuclear Security Administration Office of Nuclear Forensics (Department of Energy (DOE)). It is the program that operates the Nuclear Forensics analytical capability for interdicted nuclear materials. The FBI, Department of Energy (DOE) Office of Intelligence and Counterintelligence, and DHS are participants in the program. The methods and signatures are provided to operators in the FBI, Department of Defense (DOD), DOE, and intelligence community.

- **Problem:** There is a need to assess, identify, develop, demonstrate, and operationalize scientific and technological approaches that address gaps in the *National Strategic Five-Year Plan for Improving the Nuclear Forensics and Attribution Capabilities of the United States FY 2015 –2019,* and to continuously improve the speed, quality, and confidence of pre-detonation bulk material nuclear forensics methodologies.

- **Solution:** The Technology Advancement Project explores innovative, low-risk, later-stage technologies and methodologies. Specifically, the Technology Advancement program develops technologies and methodologies that:
  - Address capability gaps and weaknesses found in the *National Strategic Five-Year Plan for Improving the Nuclear Forensics and Attribution Capabilities of the United States FY 2015 - 2019*;
  - Assesses current forensics laboratory performance, identifies improvement areas, develops methodologies, and fields solutions to enhance operational nuclear forensics capabilities; and
  - Develops pre-detonation material nuclear forensics signatures to determine material and statistical population characteristics that can uniquely identify linkages with known or predicted material characteristics.

- **Impact:** Capabilities developed under the Technology Advancement program continuously improve the USG pre-detonation materials and the nuclear forensics operational capability to increase speed, confidence and accuracy of results. In addition, Technology Advancement efforts support development of the next generation of nuclear forensic scientific expertise.

<u>Sub-Projects</u>

- *Reference Material Development:* Reference materials serve as a standard for assessing forensic analysis methods. The Reference Material Development Project prepares certified reference materials and other well-characterized materials to support the Methodology Benchmarking Project, exercises, and operational quality assurance activities. Specific activities include but are not limited to, validating measurement methods and operational laboratory proficiency testing performed through the interagency Bulk Special Nuclear Materials Analysis Program. The National

Technical Nuclear Forensics Center (NTNFC) has prioritized the community needs for certified reference materials for nuclear forensics, and the plan extends for the next 20 years due to the limited capacity of the specialized laboratories and personnel.

- *Plutonium Processing Signatures:* The Plutonium Processing Signatures Project is operating a capability to simulate industrial production-scale plutonium materials processing on a much smaller, laboratory scale. The produced materials are analyzed to reveal and confirm discriminating signatures and are also used for creating well-characterized reference materials for methodology validation and signature development. This effort is specifically useful to simulate production processes from which the USG does not have representative samples, but since the processing steps are known, such production materials can be replicated.
- *Uranium Processing Signatures:* The Uranium Processing Signatures Project continues to operate and improve a capability to simulate industrial production-scale uranium materials processing on a much smaller, laboratory scale. The materials are analyzed to reveal and confirm discriminating signatures and are also used for creating well-characterized reference materials for methodology validation and signature development. This effort is specifically useful to simulate production processes from which the USG does not have representative samples, but since the processing steps are known, such production materials can be replicated.
- *Material Characterization:* The Material Characterization Project allows for operational use of validated analytical methods to inform and support signature development and to provide information to the Nuclear Materials Information Program. As new signatures are developed, materials are characterized to support development and validation of those signatures. This is a continuing effort, coordinated with DOE and the New Methodology Development, New Signature Development, and Data Evaluation Tools Projects.
- *Methodology Benchmarking:* The Methodology Benchmarking Project evaluates and benchmarks laboratory capabilities to perform specific analytical methods. This project identifies (1) the most accurate, precise, and timely methods available and appropriate for operational use, and (2) gaps for which improved methods are needed and that will be developed under the New Methodology Development Project. Improved methods are then transitioned to the operational laboratories through a technology transfer workshop.
- *Data Evaluation Tools:* The Data Evaluation Tools Project develops and demonstrates the next generation of tools for data pattern analysis and methods to assess whether or not measurements from samples can be linked and included or excluded from specific families of signatures.
- *New Methodology Development:* The New Methodology Development Project advances the accuracy, precision, and timeliness of measurement techniques. This project focuses on activities at TRLs 5-7, while Transformational and Applied R&D in the Exploratory Research Program addresses efforts at TRLs 2-5.
- *New Signature Development:* The New Signature Development Project determines material and statistical population characteristics that can uniquely identify linkages with known or predicted material characteristics. This project focuses on activities at TRLs 5-7, while Transformational and Applied R&D in the Exploratory Research Program addresses efforts at TRLs 2-5.

FY 2018 Key Milestone Events

- Produced two certified reference materials for forensic method improvement and quality assurance purposes.
- Operated the laboratory-scale uranium and plutonium processing capabilities to produce one plutonium material for signature development.
- Completed transition to operational use an improved methodology for characterization of trace elements in uranium.
- Continued transition to operational use an improved methodology for characterization of trace elements in plutonium.
- Continued benchmarking study for improving measurements of trace elements in uranium.

FY 2019 Planned Key Milestone Events

- N/A.

FY 2020 Planned Key Milestone Events

- N/A.

Overall Project Funding

(Dollars in Thousands)	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020
Project Funding	$9,851	$9,883	$9,152		
Obligations	$9,673	$9,497	$3,365		

Project Schedule

Research & Development Description	Planned Start Date	Planned Completion
FY 2018		
New/Improved Methodology Development	FY 2018 Q1	Ongoing
Nuclear Forensic Certified Reference Material Production	FY 2018 Q1	Ongoing
Radiological & Nuclear Material Characterizations	FY 2018 Q1	Ongoing
Methodology Benchmarking Study	FY 2018 Q1	Ongoing
Stable & Radioisotope Mass Separators	FY 2018 Q1	Ongoing
Radiological Sealed Source Library	FY 2018 Q1	Ongoing
Plutonium and Uranium Signature Development	FY 2018 Q1	Ongoing
Data Evaluation Tools	FY 2018 Q1	Ongoing

Type of Research

- **Developmental:**
  - Reference Material Development, Material Characterization, Methodology Benchmarking, Plutonium Processing Signatures, Uranium Processing Signatures.

- **Applied:**
  New Signature Development, New Methodology Development, Data Evaluation Tools.

Technology Readiness Level

Levels 5-7.

Transition Plans

Successful Technology Advancement methodologies and concepts transition to operational customers through the Bulk Special Nuclear Material (SNM) Analysis Program.

National Nuclear Forensics Expertise Development

As mandated by the *Nuclear Forensics and Attribution Act, 2010 (P.L. 111-140)*, the National Nuclear Forensics Expertise Development Program (NNFEDP), as well as the Federal Expertise Development Program (FEDP) which resides within, are the comprehensive USG effort to address the enduring challenge of sustaining a preeminent workforce of scientists and policymakers educated and trained in nuclear forensics-related specialties. NNFEDP initiatives aim to maintain the technical expertise required to execute the Nation's nuclear forensics mission through interdisciplinary R&D collaboration among students, academic departments, universities, and national laboratories. FEDP enhances the education of the Federal workforce in areas critical to technical nuclear forensics, facilitates technical and professional development, and promotes understanding of partner department and agency missions. These programs are led by DNDO in close collaboration with the Departments of Defense, Energy, and Justice (Federal Bureau of Investigation), through a biannual Expertise Development Committee.

- **Problem:** Current TNF activities leverage significantly off the shrinking nuclear weapons complex which has been in decline since the end of the Cold War with nuclear scientists leaving the field for other pursuits. The majority of nuclear scientists remaining are retired or nearing retirement. Additionally, compounding the issue, the number of students entering into the academic pipeline in nuclear forensics-related degree programs has declined significantly since the 1970s.

- **Solution:** Provide long-term and continued investment to promote education and training within academia, the national and defense laboratories that perform nuclear forensics research, and the Federal workforce. Bolster the existing workforce through providing technical and policy training and education opportunities for senior and junior scientists as well as Federal personnel.

- **Impact**: An enduring and sustainable nuclear forensics workforce which is able to meet technical and policy mission requirements.

Sub-Projects

- *Academics:* The Academics Sub Project supports a current DHS management performance measure for DNDO. National Strategic Five-Year Plan activities and investment areas under this goal include the implementation of academic and workforce programs designed to ensure a robust and enduring nuclear forensics workforce. Initiatives included in this project are an undergraduate summer school, graduate fellowships and internships, and collaborative national laboratory and university R&D support.
- *Assessments Project:* The Assessments Sub Project evaluates the state of the workforce within the national and defense laboratory system, relative to USG NTNF mission requirements, in order to appropriately scale and scope the NNFEDP into future years.
- *Laboratories Project:* The Laboratories Sub Project supports post-doctorate fellowships and early-career awards at the national laboratories as well as planned outreach and recruitment activities to potential university and student participants. Additionally, the Laboratories Project supports development and presentation of curricula related to nuclear forensics training for the Federal workforce.

FY 2018 Key Milestone Events

- Supported two research awards; one undergraduate summer school; three graduate fellowships; 10 post-doctorate fellowship positions; and one early-career award.

- Evaluate the current state of the nuclear forensics workforce within the DOE national laboratories and DOD radiochemistry laboratory to inform and guide expertise development program efforts.

FY 2019 Planned Key Milestone Events

- N/A.

FY 2020 Planned Key Milestone Events

- N/A.

Overall Project Funding

(Dollars in Thousands)	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020
Project Funding	$4,863	$5,228	$5,239	-	-
Obligations	$4,563	$4,628	$2,044	-	-

Project Schedule

Research & Development Description	Planned Start Date	Planned Completion
FY 2018		
Nuclear Forensics Undergraduate Summer School	FY 2018 Q1	Ongoing
Post-Doctoral Fellowships	FY 2018 Q1	Ongoing
Early-Career Award	FY 2018 Q1	Ongoing
Nuclear Forensics Research Awards	FY 2018 Q1	Ongoing

Type of Research

Basic, Applied, Developmental.

Technology Readiness Level

TRL 1-7.

Transition Plans

NNFEDP transition plans revolve around on the ability to transition people, from academia to the national laboratories or Federal agencies, and knowledge, from senior scientists and policymakers to junior workforce staff. Any research performed within the NNFEDP is at the direction of other Federal research programs which are responsible for transitioning the research from TRL 1-3 into an operational method or tool.

Department of Homeland Security

Domestic Nuclear Detection Office

Federal Assistance

Fiscal Year 2020
Congressional Justification

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Federal Assistance

Budget Comparison and Adjustments

Comparison of Budget Authority and Request

Organization (Dollars in Thousands)	FY 2018 Enacted			FY 2019 President's Budget			FY 2020 President's Budget			FY 2019 to FY 2020 Total Changes		
	Pos.	FTE	Amount	Pos.	FTE	Amount	Pos.	FTE	Amount	Pos.	FTE	Amount
Federal, State, Local, Territorial, and Tribal Support	-	-	$24,884	-	-	-	-	-	-	-	-	-
Securing the Cities	-	-	$21,135	-	-	-	-	-	-	-	-	-
Total	**-**	**-**	**$46,019**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Subtotal Discretionary - Appropriation	-	-	$46,019	-	-	-	-	-	-	-	-	-

With the transfer of its functions to the Countering Weapons of Mass Destruction Office (CWMD), no funds are included in the Fiscal Year (FY) 2019 President's Budget or the FY 2020 President's Budget for the Domestic Nuclear Detection Office (DNDO). Further information on funding for those functions can be found in the FY 2020 President's Budget for CWMD.

Federal Assistance
Budget Authority and Obligations

Budget Authority *(Dollars in Thousands)*	**FY 2018**	**FY 2019**	**FY 2020**
Enacted/Request	**$46,019**	**-**	**-**
Carryover and/or Recoveries (Actual/Estimates/Projections)	$23,684	-	-
Rescissions to Current Year/Budget Year	-	-	-
Net Sequestered Resources	-	-	-
Reprogrammings/Transfers	($4,616)	-	-
Supplementals	-	-	-
Total Budget Authority	**$65,087**	**-**	**-**
Collections – Reimbursable Resources	$100	-	-
Total Budget Resources	**$65,187**	**-**	**-**
Obligations (Actual/Estimates/Projections)	$27,667	-	-
Personnel: Positions and FTE			
Enacted/Request Positions	-	-	-
Enacted/Request FTE	-	-	-
Onboard and Actual FTE; Includes Collections - Reimbursable Resources			
Onboard (Actual/Estimates/Projections)	-	-	-
FTE (Actual/Estimates/Projections)	-	-	-

Federal Assistance
Summary of Budget Changes

Budget Formulation Activity *(Dollars in Thousands)*	Positions	FTE	Amount
FY 2018 Enacted	-	-	**$46,019**
FY 2019 President's Budget	-	-	-
FY 2020 Base Budget	-	-	-
FY 2020 Request	-	-	-
FY 2019 To FY 2020 Change	-	-	-

Federal Assistance
Non Pay Budget Exhibits

Non Pay Summary

Organization *(Dollars in Thousands)*	FY 2018 Enacted	FY 2019 President's Budget	FY 2020 President's Budget	FY 2019 to FY 2020 Total Changes
Federal, State, Local, Territorial, and Tribal Support	$24,884	-	-	-
Securing the Cities	$21,135	-	-	-
Total	**$46,019**	**-**	**-**	**-**
Discretionary - Appropriation	$46,019	-	-	-

Non Pay by Object Class

Non-Pay Object Classes *(Dollars in Thousands)*	FY 2018 Enacted	FY 2019 President's Budget	FY 2020 President's Budget	FY 2019 to FY 2020 Change
21.0 Travel and Transportation of Persons	$242	-	-	-
25.1 Advisory and Assistance Services	$11,934	-	-	-
25.2 Other Services from Non-Federal Sources	$573	-	-	-
25.3 Other Goods and Services from Federal Sources	$15,620	-	-	-
41.0 Grants, Subsidies, and Contributions	$17,650	-	-	-
Total - Non Pay Object Classes	**$46,019**	**-**	**-**	**-**

Federal, State, Local, Territorial, and Tribal Support – PPA

Budget Comparison and Adjustments

Comparison of Budget Authority and Request

Organization (Dollars in Thousands)	FY 2018 Enacted			FY 2019 President's Budget			FY 2020 President's Budget			FY 2019 to FY 2020 Total Changes		
	Pos.	FTE	Amount	Pos.	FTE	Amount	Pos.	FTE	Amount	Pos.	FTE	Amount
Federal, State, Local, Territorial, and Tribal Support	-	-	$24,884	-	-	-	-	-	-	-	-	-
Total	**-**	**-**	**$24,884**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Subtotal Discretionary - Appropriation	-	-	$24,884	-	-	-	-	-	-	-	-	-

With the transfer of its functions to the Countering Weapons of Mass Destruction Office (CWMD), no funds are included in the Fiscal Year (FY) 2019 President's Budget or the FY 2020 President's Budget for the Domestic Nuclear Detection Office (DNDO). Further information on funding for those functions can be found in the FY 2020 President's Budget for CWMD.

Federal, State, Local, Territorial, and Tribal Support – PPA
Budget Authority and Obligations

Budget Authority *(Dollars in Thousands)*	**FY 2018**	**FY 2019**	**FY 2020**
Enacted/Request	**$24,884**	**-**	**-**
Carryover and/or Recoveries (Actual/Estimates/Projections)	$4,860	-	-
Rescissions to Current Year/Budget Year	-	-	-
Net Sequestered Resources	-	-	-
Reprogrammings/Transfers	($4,616)	-	-
Supplementals	-	-	-
Total Budget Authority	**$25,128**	**-**	**-**
Collections – Reimbursable Resources	$100	-	-
Total Budget Resources	**$25,228**	**-**	**-**
Obligations (Actual/Estimates/Projections)	$7,700	-	-
Personnel: Positions and FTE			
Enacted/Request Positions	-	-	-
Enacted/Request FTE	-	-	-
Onboard and Actual FTE; Includes Collections - Reimbursable Resources			
Onboard (Actual/Estimates/Projections)	-	-	-
FTE (Actual/Estimates/Projections)	-	-	-

Federal, State, Local, Territorial, and Tribal Support – PPA
Summary of Budget Changes

Budget Formulation Activity *(Dollars in Thousands)*	Positions	FTE	Amount
FY 2018 Enacted	-	-	**$24,884**
FY 2019 President's Budget	-	-	-
FY 2020 Base Budget	-	-	-
FY 2020 Request	-	-	-
FY 2019 To FY 2020 Change	-	-	-

Federal, State, Local, Territorial, and Tribal Support – PPA
Non Pay Budget Exhibits

Non Pay Summary

Organization *(Dollars in Thousands)*	**FY 2018 Enacted**	**FY 2019 President's Budget**	**FY 2020 President's Budget**	**FY 2019 to FY 2020 Total Changes**
Federal, State, Local, Territorial, and Tribal Support	$24,884	-	-	-
Total	**$24,884**	**-**	**-**	**-**
Discretionary - Appropriation	$24,884	-	-	-

Non Pay by Object Class

Non-Pay Object Classes *(Dollars in Thousands)*	**FY 2018 Enacted**	**FY 2019 President's Budget**	**FY 2020 President's Budget**	**FY 2019 to FY 2020 Change**
21.0 Travel and Transportation of Persons	$207	-	-	-
25.1 Advisory and Assistance Services	$8,484	-	-	-
25.2 Other Services from Non-Federal Sources	$573	-	-	-
25.3 Other Goods and Services from Federal Sources	$15,620	-	-	-
Total - Non Pay Object Classes	**$24,884**	**-**	**-**	**-**

Securing the Cities – PPA

Budget Comparison and Adjustments

Comparison of Budget Authority and Request

Organization (Dollars in Thousands)	FY 2018 Enacted			FY 2019 President's Budget			FY 2020 President's Budget			FY 2019 to FY 2020 Total Changes		
	Pos.	FTE	Amount	Pos.	FTE	Amount	Pos.	FTE	Amount	Pos.	FTE	Amount
Securing the Cities	-	-	$21,135	-	-	-	-	-	-	-	-	-
Total	**-**	**-**	**$21,135**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Subtotal Discretionary - Appropriation	-	-	$21,135	-	-	-	-	-	-	-	-	-

With the transfer of its functions to the Countering Weapons of Mass Destruction Office (CWMD), no funds are included in the Fiscal Year (FY) 2019 President's Budget or the FY 2020 President's Budget for the Domestic Nuclear Detection Office (DNDO). Further information on funding for those functions can be found in the FY 2020 President's Budget for CWMD.

Securing the Cities – PPA
Budget Authority and Obligations

Budget Authority *(Dollars in Thousands)*	**FY 2018**	**FY 2019**	**FY 2020**
Enacted/Request	**$21,135**	**-**	**-**
Carryover and/or Recoveries (Actual/Estimates/Projections)	$18,824	-	-
Rescissions to Current Year/Budget Year	-	-	-
Net Sequestered Resources	-	-	-
Reprogrammings/Transfers	-	-	-
Supplementals	-	-	-
Total Budget Authority	**$39,959**	**-**	**-**
Collections – Reimbursable Resources	-	-	-
Total Budget Resources	**$39,959**	**-**	**-**
Obligations (Actual/Estimates/Projections)	$19,967	-	-
Personnel: Positions and FTE			
Enacted/Request Positions	-	-	-
Enacted/Request FTE	-	-	-
Onboard and Actual FTE; Includes Collections - Reimbursable Resources			
Onboard (Actual/Estimates/Projections)	-	-	-
FTE (Actual/Estimates/Projections)	-	-	-

Securing the Cities – PPA
Summary of Budget Changes

Budget Formulation Activity *(Dollars in Thousands)*	Positions	FTE	Amount
FY 2018 Enacted	-	-	$21,135
FY 2019 President's Budget	-	-	-
FY 2020 Base Budget	-	-	-
FY 2020 Request	-	-	-
FY 2019 To FY 2020 Change	-	-	-

Securing the Cities – PPA
Non Pay Budget Exhibits

Non Pay Summary

Organization *(Dollars in Thousands)*	**FY 2018 Enacted**	**FY 2019 President's Budget**	**FY 2020 President's Budget**	**FY 2019 to FY 2020 Total Changes**
Securing the Cities	$21,135	-	-	-
Total	**$21,135**	**-**	**-**	**-**
Discretionary - Appropriation	$21,135	-	-	-

Non Pay by Object Class

Non-Pay Object Classes *(Dollars in Thousands)*	**FY 2018 Enacted**	**FY 2019 President's Budget**	**FY 2020 President's Budget**	**FY 2019 to FY 2020 Change**
21.0 Travel and Transportation of Persons	$35	-	-	-
25.1 Advisory and Assistance Services	$3,450	-	-	-
41.0 Grants, Subsidies, and Contributions	$17,650	-	-	-
Total - Non Pay Object Classes	**$21,135**	**-**	**-**	**-**