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Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Navy										Date: February 2018		
Appropriation/Budget Activity 1319: Research, Development, Test & Evaluation, Navy / BA 5: System Development & Demonstration (SDD)					R-1 Program Element (Number/Name) PE 0604601N / Mine Development							
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
Total Program Element	195.856	14.860	25.635	25.756	-	25.756	22.021	21.513	21.204	21.215	Continuing	Continuing
0267: Mine Improvements	195.856	14.860	17.617	18.401	-	18.401	15.160	19.103	10.363	10.152	Continuing	Continuing
2993: Encapsulated Effector	0.000	0.000	8.018	7.355	-	7.355	6.861	2.410	10.841	11.063	Continuing	Continuing

A. Mission Description and Budget Item Justification

This program element provides resources to develop naval mine systems used to establish and maintain control of essential sea areas. Naval mines are used to deny sea area or inflict damage on adversary shipping to hinder, disrupt, and deny adversary operations. Naval mining is employed to reduce the adversary's threat to friendly forces and preserve access. Mining complements and comprises an essential part of other warfare areas; particularly strike, anti-submarine, and anti-surface warfare.

Resources are for developing and deploying improvements to target detection of modern threat vessels, reconfiguring and improving existing mine hardware for delivery from safe standoff distances, including integration with unmanned systems, adding a capability for networked command and control of deployed minefields, updating minefield planning tools to enable required operational timelines, and developing a wide area of coverage mine system capable of operating in intermediate and deep water depths. Core capabilities enabled include forward presence, deterrence, sea control, power projection, and maritime security to maintain freedom of the seas.

B. Program Change Summary (\$ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Previous President's Budget	15.290	25.635	18.495	-	18.495
Current President's Budget	14.860	25.635	25.756	-	25.756
Total Adjustments	-0.430	0.000	7.261	-	7.261
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.429	0.000			
• Program Adjustments	0.000	0.000	7.700	-	7.700
• Rate/Misc Adjustments	-0.001	0.000	-0.439	-	-0.439

Change Summary Explanation

FY19 +\$7,261k Total Adjustments: +\$7,700k for Clandestine Delivered Mine (CDM) Development; -\$133k Process Improvement Reduction; \$306k reduction for economic assumptions

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy										Date: February 2018		
Appropriation/Budget Activity 1319 / 5					R-1 Program Element (Number/Name) PE 0604601N / <i>Mine Development</i>				Project (Number/Name) 0267 / <i>Mine Improvements</i>			
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
0267: <i>Mine Improvements</i>	195.856	14.860	17.617	18.401	-	18.401	15.160	19.103	10.363	10.152	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Naval mines are used to deter or control adversary movements, including surface ships and submarines. Mine Improvement R&D supports the capability to maintain effectiveness of mines facing new threat targets with increasing emphasis on major regional conflicts and littoral warfare in shallow water. The funding supports four major project areas.

1) Quickstrike Mod 3 improves effectiveness of existing Quickstrike mines against modern threats by using a programmable Target Detection Device (TDD) Mk 71. Quickstrike Mod 3 utilizes modeling and analysis to improve target detection and response by developing optimized mine settings and firing algorithms.

2) Aerial delivery improvements support capabilities required by a Joint Emergent Operational Needs Statement (JEONS). This includes adding GPS-guided, modular flight gear to the Quickstrike series to reduce risk to delivery aircraft by introducing precision placement and standoff range.

3) Clandestine Delivered Mine (CDM) provides a capability required by the JEON PC-0012 which will convert legacy mining systems for delivery by Extra Large Unmanned Undersea Vehicles (XLUUV). This capability allows access to contested environments and reduces risk by using unmanned platforms. Pre-planned product improvements to CDM incorporates the programmable TDD Mk 71 and adds remote command and control functions for increased operational flexibility and safety for emplaced minefields.

4) Minefield planning improvements include incorporation of new targeting algorithms, mine settings, and corresponding damage data for weapon/target pairs into existing minefield planning software. Also included is the development of upgrades to the software tool to allow optimization of minefield planning to account for new precision placement capabilities inherent to the JDAM-guided Quickstrike and CDM mines described above.

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)

	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: Product Development	10.675	11.984	12.668	0.000	12.668
Articles:	-	-	-	-	-
FY 2018 Plans:					
Complete development of targeting algorithm for the large ship algorithm. Continue generating operational data, based on updated fleet priority targets, for following target detection algorithms: fast patrol boat, diesel electric submarines, and large ship algorithms. Support and assess results of end-to-end testing of CDM phase 1 during an in-water event that demonstrates weapon build-up, loading, transit, delivery, arming sequence, target detection, and simulated fire. Obtain WSESRB concurrence for CDM phase 1. Development prototype					

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Appropriation/Budget Activity 1319 / 5		R-1 Program Element (Number/Name) PE 0604601N / Mine Development	Project (Number/Name) 0267 / Mine Improvements			
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
remote control system for CDM, including integration of Target Detection Device Mk 71 in CDM. Develops underwater networking between mines, modifies commercial communications equipment to optimize reliability and range, while minimizing probability of detection by adversaries. Develop ruggedized flight gear interfaces to be compatible with GPS-guidance kits and high speed water impacts. Perform safety analysis of proposed design changes to mitigate hazards FY 2019 Base Plans: Complete development of updated targeting algorithm for diesel electric submarine. Continue development of CDM incremental improvements, including an updated fuze design to allow for remote arming and disarming functions. Continue development of networked communications to optimize reliability and range, while minimizing probability of detection by adversaries. Conduct system safety assessment and analysis to mitigate hazards in order to obtain concurrence by safety approval authorities. FY 2019 OCO Plans: N/A FY 2018 to FY 2019 Increase/Decrease Statement: Increase in FY19 will support the increased development efforts for the CDM incremental improvements.						
Title: Support Articles:		0.060 -	0.085 -	0.090 -	0.000 -	0.090 -
FY 2018 Plans: Maintain cyber security posture and provide technical support of Mine Warfare development lab. Begin cyber security analysis and documentation in support of the remote control of the Clandestine Delivered Mine. FY 2019 Base Plans: Maintain cyber security posture and provide technical support of Mine Warfare development lab. Continue cyber security analysis and documentation in support of the remote control of the Clandestine Delivered Mine. FY 2019 OCO Plans: N/A FY 2018 to FY 2019 Increase/Decrease Statement: The minimal increase in FY19 supports the required cyber security efforts and the mine warfare development lab.						
Title: Management: Articles:		0.060 -	0.080 -	0.085 -	0.000 -	0.085 -

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Appropriation/Budget Activity 1319 / 5		R-1 Program Element (Number/Name) PE 0604601N / Mine Development		Project (Number/Name) 0267 / Mine Improvements		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
FY 2018 Plans: Program management support, contract support and travel						
FY 2019 Base Plans: Program management support, contract support and travel						
FY 2019 OCO Plans: N/A						
FY 2018 to FY 2019 Increase/Decrease Statement: The minimal increase in FY19 supports management of the mine development programs.						
Title: Test and Evaluation		4.065	5.468	5.558	0.000	5.558
Articles:		-	-	-	-	-
FY 2018 Plans: Support JEONS capability development by testing Quickstrike configuration with JDAM equipped tail section, including interface reliability testing and aircraft integration testing. Conduct laboratory integration testing and in-water test of CDM to evaluate interfaces with delivery vehicle, proper deployment and safe arming sequence. Conduct end-to-end testing of CDM phase I during an in-water event that demonstrates weapon build-up, loading, transit, delivery, arming sequence, target detection, and simulated fire. Complete safety qualification testing of fuze and battery components of CDM. Conduct explosive ordnance disposal (EOD) render safe procedures testing to ensure safe disposal procedures are safe and effective for EOD forces						
FY 2019 Base Plans: Finish aircraft certification of B-52. Conduct explosive ordnance disposal (EOD) render safe procedures testing to ensure safe disposal procedures are safe and effective for EOD forces, based on updated target algorithms. Conduct system-level integration testing of CDM phase 2 using engineering design models to ensure TDD Mk 71 and remote control devices function as designed. Initiate safety qualification testing of updated fuze and battery components of CDM Phase 2. Conduct functional and reliability testing of prototype reversible fuze design for use with CDM.						
FY 2019 OCO Plans: N/A						
FY 2018 to FY 2019 Increase/Decrease Statement: The minimal increase in FY19 will support the completion of the aircraft certification of the B-52.						
Accomplishments/Planned Programs Subtotals		14.860	17.617	18.401	0.000	18.401

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Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604601N / <i>Mine Development</i>	Project (Number/Name) 0267 / <i>Mine Improvements</i>	

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

<u>Line Item</u>	<u>FY 2017</u>	<u>FY 2018</u>	<u>FY 2019</u> <u>Base</u>	<u>FY 2019</u> <u>OCO</u>	<u>FY 2019</u> <u>Total</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
• WPN 3231: <i>Quickstrike Mine</i>	1.236	10.337	9.758	-	9.758	5.183	5.289	8.585	8.793	0.000	110.828

Remarks

D. Acquisition Strategy

Procurement of Target Detecting Device (TDD) Mk 71, MK 62/63 kits, MK 65, Clandestine Delivered Mine (CDM) kits and associated components.

E. Performance Metrics

N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy												Date: February 2018			
Appropriation/Budget Activity 1319 / 5						R-1 Program Element (Number/Name) PE 0604601N / Mine Development				Project (Number/Name) 0267 / Mine Improvements					
Product Development (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Primary Hardware Development	WR	NSWC PC : Panama City, FL	117.357	0.000		0.000		0.000		-		0.000	0.000	117.357	-
Ancillary Hardware Development	C/CPAF	Various : Various	4.062	0.050	Nov 2016	0.000		0.000		-		0.000	0.000	4.112	-
Software Development	WR	NSWC, PC : Panama City, FL	21.215	1.470	Oct 2016	2.050	Oct 2017	2.091	Oct 2018	-		2.091	0.000	26.826	-
Clandestine Mine	WR	NSWC, PC : Panama City, FL	4.518	2.182	Oct 2016	3.233	Oct 2017	2.847	Oct 2018	-		2.847	0.000	12.780	-
Clandestine Mine	WR	NSWC, IH : Indian Head, MD	4.988	2.487	Nov 2016	4.533	Nov 2017	5.750	Oct 2018	-		5.750	0.000	17.758	-
Clandestine Mine	C/CPFF	JHU/APL : Baltimore, MD	5.790	1.211	Dec 2016	2.168	Dec 2017	1.980	Dec 2018	-		1.980	0.000	11.149	-
Quickstrike JDAM	WR	NSWC PC : Panama City, FL	0.000	1.628	Jun 2017	0.000		0.000		-		0.000	0.000	1.628	-
Quickstrike JDAM	WR	NSWC IH : Indian Head, Md	0.000	1.647	Jun 2017	0.000		0.000		-		0.000	0.000	1.647	-
Subtotal			157.930	10.675		11.984		12.668		-		12.668	0.000	193.257	N/A
Support (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
IA/ILS/Technical	WR	NSWC PC : Panama City, FL	0.872	0.060	Oct 2016	0.085	Nov 2017	0.090	Oct 2018	-		0.090	Continuing	Continuing	Continuing
Subtotal			0.872	0.060		0.085		0.090		-		0.090	Continuing	Continuing	N/A
Test and Evaluation (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Aircraft interface & survivability testing	WR	NSWC PC : Panama City, FL	0.000	4.065	May 2017	5.468	Oct 2018	3.715	Oct 2018	-		3.715	0.000	13.248	-

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Appropriation/Budget Activity 1319 / 5						R-1 Program Element (Number/Name) PE 0604601N / <i>Mine Development</i>				Project (Number/Name) 0267 / <i>Mine Improvements</i>					
Test and Evaluation (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Development Test & Evaluation	WR	NSWC IH : Indian Head, MD	0.000	0.000		0.000		1.843	Oct 2018	-		1.843	0.000	1.843	-
Subtotal			0.000	4.065		5.468		5.558		-		5.558	0.000	15.091	N/A
Management Services (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Government Engineering Support	C/CPAF	Various : Various	36.252	0.050	Dec 2016	0.050	Oct 2017	0.055	Oct 2018	-		0.055	0.000	36.407	-
Program Management Support	C/CPAF	Various : Various	0.728	0.000		0.020	Oct 2017	0.020	Nov 2018	-		0.020	Continuing	Continuing	Continuing
Travel	Various	NAVSEA : Washington DC	0.074	0.010	Sep 2017	0.010	Oct 2017	0.010	Oct 2018	-		0.010	Continuing	Continuing	Continuing
Subtotal			37.054	0.060		0.080		0.085		-		0.085	Continuing	Continuing	N/A
			Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			195.856	14.860		17.617		18.401		-		18.401	Continuing	Continuing	N/A
Remarks															

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PE 0604601N: *Mine Development*
Navy

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PE 0604601N / Mine Development

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Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604601N / <i>Mine Development</i>	Project (Number/Name) 0267 / <i>Mine Improvements</i>	

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Proj 0267				
System Development: Minefield Planning Tactical Decision Aid Improvements: Target Detection Algorithms / Operational Data	1	2017	4	2023
System Development: Minefield Planning Tactical Decision Aid Improvements: Minefield Planning / Tactical Decision Aid	1	2017	3	2019
System Development: Clandestine Mining: Increment I	1	2017	4	2018
System Development: Clandestine Mining: TDD upgrade & Remote control	1	2017	2	2021
System Development: Clandestine Mining: Fuze upgrade & comms improvement	1	2017	2	2023
System Development: Clandestine Mining: System Safety	1	2017	4	2023
System Development: Quickstrike JDAM Development: Quickstrike JDAM Development	3	2017	4	2018
Test and Evaluation: Clandestine Mining Testing: CDM Integration Testing	1	2017	4	2017
Test and Evaluation: Clandestine Mining Testing: End to End Demo	2	2018	3	2018
Test and Evaluation: Clandestine Mining Testing: Remote Control Test	4	2018	1	2019
Test and Evaluation: Clandestine Mining Testing: Fuze Upgrade Test	4	2018	4	2020
Test and Evaluation: Quickstrike Mod 3: QS Mod 3 Certification	1	2017	4	2023
Test and Evaluation: Quickstrike Mod 3: QS EOD Render Safe Testing	2	2017	2	2017
Test and Evaluation: Quickstrike Mod 3: QS JDAM Testing	1	2018	4	2018

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy										Date: February 2018		
Appropriation/Budget Activity 1319 / 5					R-1 Program Element (Number/Name) PE 0604601N / <i>Mine Development</i>				Project (Number/Name) 2993 / <i>Encapsulated Effector</i>			
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
2993: <i>Encapsulated Effector</i>	0.000	0.000	8.018	7.355	-	7.355	6.861	2.410	10.841	11.063	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Encapsulated Effector transitions technology developed by the Advanced Undersea Weapon System (AUWS) enabling capability starting in FY18. The program provides maritime mining capability in intermediate water depths compared to existing bottom mines, uses existing kinetic payloads to engage enemy targets, and provides a wide area of coverage per each weapon. The program uses a weapon which is self-contained and is released when a target is detected and uses mobility to engage the target. The system uses modern sensing and processing technology to enable accurate targeting at increased range, incorporates remote control to allow operational flexibility to activate/deactivate and/or change targeting parameters, and maintain minefield resilience even as weapons are expended against targets. The result is expanded operating areas to restrict or deny adversary access to the intended area while using fewer weapons than traditional mines.

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)

	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: Product Development	0.000	7.853	7.185	0.000	7.185
Articles:	-	-	-	-	-
FY 2018 Plans: Conduct engineering analysis to allocate requirements to subsystems, develop engineering architecture products, begin development of Systems Engineering Plan (SEP) and Test and Evaluation Master Plan (TEMP). Coordinate transition of technology products from the Office of Naval Research's Advanced Undersea Weapon System Future Naval Capability program. Establish system safety program to evaluate and mitigate hazards across the program lifecycle					
FY 2019 Base Plans: Conduct performance analysis and trade studies to develop a system level performance specification. Finalize SEP and TEMP documents to guide engineering planning. Define subsystem interfaces and develop interface control document between primary hardware components and selected weapon. Conduct preliminary hazard assessment of system architecture. Successfully achieve Milestone B in 3QFY19.					
FY 2019 OCO Plans: N/A					
FY 2018 to FY 2019 Increase/Decrease Statement: Decrease from FY18 to FY19 is in accordance with planned program profile.					
Title: Support	0.000	0.085	0.090	0.000	0.090
Articles:	-	-	-	-	-

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Appropriation/Budget Activity 1319 / 5		R-1 Program Element (Number/Name) PE 0604601N / Mine Development		Project (Number/Name) 2993 / Encapsulated Effector		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
FY 2018 Plans: Initiate cyber security analysis and documentation in support of the remote control of the Encapsulated Effector.						
FY 2019 Base Plans: Continue cyber security analysis and documentation in support of the remote control of the Encapsulated Effector.						
FY 2019 OCO Plans: N/A						
FY 2018 to FY 2019 Increase/Decrease Statement: The minimal increase in FY19 supports cyber security analysis.						
Title: Management:		0.000	0.080	0.080	0.000	0.080
Articles:		-	-	-	-	-
FY 2018 Plans: Program Management Support, contract support and Travel						
FY 2019 Base Plans: Program Management Support, contract support and Travel						
FY 2019 OCO Plans: N/A						
FY 2018 to FY 2019 Increase/Decrease Statement: No significant change from FY 2018 to FY 2019						
Accomplishments/Planned Programs Subtotals		0.000	8.018	7.355	0.000	7.355
C. Other Program Funding Summary (\$ in Millions)						
N/A						
Remarks						
D. Acquisition Strategy						
The Encapsulated Effector plans to leverage Navy warfare center expertise to perform requirements analysis and engineering architecture design to identify mature technologies to meet the operational objectives. Those engineering products will be provided to a prime contractor for final system integration and testing. The contractor will be responsible for the final design to optimize producibility, manufacture engineering design models to be used during testing, and test planning and execution to gather the required data to support a production decision.						

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<div>E. Performance Metrics</div> <div>N/A</div>		

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Appropriation/Budget Activity 1319 / 5						R-1 Program Element (Number/Name) PE 0604601N / <i>Mine Development</i>				Project (Number/Name) 2993 / <i>Encapsulated Effector</i>					
Product Development (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Primary Hardware Development	WR	NSWC PC : Panama City, FL	0.000	0.000		5.988	Nov 2017	5.150	Jan 2019	-		5.150	Continuing	Continuing	Continuing
Weapon Interfaces & Modifications	WR	NUWC NPT : Newport, RI	0.000	0.000		1.253	Dec 2017	1.435	Nov 2018	-		1.435	0.000	2.688	-
System Safety	WR	NSWC IHEODTD : Indian Head, MD	0.000	0.000		0.612	Nov 2017	0.600	Dec 2018	-		0.600	0.000	1.212	-
Subtotal			0.000	0.000		7.853		7.185		-		7.185	Continuing	Continuing	N/A
Support (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Cyber / Tech support	WR	NSWC PC : Panama City, FL	0.000	0.000		0.085	Dec 2017	0.090	Nov 2018	-		0.090	Continuing	Continuing	Continuing
Subtotal			0.000	0.000		0.085		0.090		-		0.090	Continuing	Continuing	N/A
Management Services (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Government Engineering Support	C/CPAF	Various : Various	0.000	0.000		0.080	Dec 2017	0.080	Nov 2018	-		0.080	Continuing	Continuing	Continuing
Subtotal			0.000	0.000		0.080		0.080		-		0.080	Continuing	Continuing	N/A
			Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			0.000	0.000		8.018		7.355		-		7.355	Continuing	Continuing	N/A
Remarks															

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PE 0604601N: *Mine Development*
Navy

R-1 Line #144

Project (Number/Name)
2993 / *Encapsulated Effector*

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Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604601N / <i>Mine Development</i>	Project (Number/Name) 2993 / <i>Encapsulated Effector</i>	

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<i>Encapsulated Effector</i>				
Acquisition Milestones: Acquisition Documentation	1	2018	3	2019
Acquisition Milestones: Milestone B Decision	3	2019	3	2019
Acquisition Milestones: Contract Award	3	2020	3	2020
Acquisition Milestones: Preliminary Design Review	2	2021	2	2021
Acquisition Milestones: Critical Design Review	3	2022	3	2022
System Development: Preliminary Design Engineering	3	2019	2	2021
System Development: Detailed Design Engineering	3	2021	3	2022
System Development: Requirements Analysis	1	2018	2	2019