

UNCLASSIFIED

Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Navy **Date:** March 2023

Appropriation/Budget Activity 1319: <i>Research, Development, Test & Evaluation, Navy / BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	R-1 Program Element (Number/Name) PE 0604536N / <i>Advanced Undersea Prototyping</i>
---	--

COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
Total Program Element	431.777	30.597	94.515	104.328	-	104.328	27.156	39.330	11.839	12.796	Continuing	Continuing
3394: <i>Adv Undersea Prototyping-Vehicles, Propulsion & Navigation</i>	431.777	30.597	94.515	104.328	-	104.328	27.156	39.330	11.839	12.796	Continuing	Continuing

A. Mission Description and Budget Item Justification

The Orca Extra Large Unmanned Undersea Vehicle (XLUUV) is the Navy's Extra Large UUV effort as part of the Family of UUVs. The Orca XLUUV effort is established to address a Joint Emergent Operational Need (JEON). Orca XLUUV is a multi-phased accelerated acquisition effort to rapidly deliver capability to the Fleet. Phase 1 was a competitively sourced design effort. Phase 2 down selected to one of the Phase 1 vendors in FY 2019 for fabrication and testing of the vehicle and support elements. Testing and delivery of the vehicles and support elements has been delayed to FY23-24 due to contractor challenges and supplier issues. The Navy is working with Boeing to mitigate schedule delays and execute risk reduction testing beginning in FY23 through the addition of a designated test and training asset (Vehicle 0). The Navy is updating facilities at the Naval Base Ventura County site for testing, training, and work-ups, in coordination with large unmanned surface vessel testing for cost efficiencies. Fabrication awards of additional Orca XLUUV systems are planned for FY26 and out, gradually ramping up quantities in future fiscal years, depending on the progress from the first five systems. XLUUV will have a modular payload bay, with defined interfaces that current and future payloads must adhere to for employment from the vehicle. The Orca XLUUV effort will integrate the currently required payload, and potential future payloads will be developed, evaluated, and preliminarily integrated leveraging the Core Technologies Program Element 0604029N. Additional XLUUV technologies/capabilities risk reduction will occur in parallel, leveraging the competitive industrial base.

B. Program Change Summary (\$ in Millions)	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Previous President's Budget	31.609	116.880	74.620	-	74.620
Current President's Budget	30.597	94.515	104.328	-	104.328
Total Adjustments	-1.012	-22.365	29.708	-	29.708
• Congressional General Reductions	-	-0.357			
• Congressional Directed Reductions	-	-22.008			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-1.012	0.000			
• Program Adjustments	0.000	0.000	29.930	-	29.930
• Rate/Misc Adjustments	0.000	0.000	-0.222	-	-0.222

UNCLASSIFIED

Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Navy Date: March 2023

Appropriation/Budget Activity
1319: *Research, Development, Test & Evaluation, Navy / BA 4: Advanced Component Development & Prototypes (ACD&P)*

R-1 Program Element (Number/Name)
PE 0604536N / *Advanced Undersea Prototyping*

Change Summary Explanation

Technical: Not applicable.

Schedule: Not applicable.

Cost:

FY 2022: -\$1.012M Small Business Innovative Research

FY 2023: -\$22.008M Direct Congressional reduction - XLUUV testing delays, -\$0.357M general Congressional reduction

FY 2024: +\$29.930M XLUUV Forward Operating Base and Program Wholeness; -\$0.222M Miscellaneous adjustments

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy										Date: March 2023		
Appropriation/Budget Activity 1319 / 4					R-1 Program Element (Number/Name) PE 0604536N / <i>Advanced Undersea Prototyping</i>				Project (Number/Name) 3394 / <i>Adv Undersea Prototyping-Vehicles, Propulsion & Navigation</i>			
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
3394: <i>Adv Undersea Prototyping-Vehicles, Propulsion & Navigation</i>	431.777	30.597	94.515	104.328	-	104.328	27.156	39.330	11.839	12.796	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Orca Extra Large Unmanned Undersea Vehicle (XLUUV) is the Navy's Extra Large UUV effort as part of the UUV Family of Systems (FoS). The Orca XLUUV effort has been established to address a Joint Emergent Operational Need (JEON). Orca XLUUV will have a modular payload bay, with defined interfaces that current and future payloads must adhere to for employment from the vehicle. The Orca XLUUV effort will integrate the currently required payload, and additional potential future payloads will be developed, evaluated, and preliminarily integrated under the Core Technologies Program Element 0604029N. Additional XLUUV technologies/capabilities risk reduction will occur in parallel, leveraging the competitive Industrial base.

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

	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Title: XLUUV Product Development	13.130	60.683	41.055	0.000	41.055
Articles:	-	-	-	-	-
Description: Orca XLUUV Phase 1 design was completed via a full and open competition with two industry teams. Phase 2 fabrication was down selected to one vendor for the fabrication and delivery of 5 Orca vehicles and an additional test and training asset (Vehicle 0) was added for risk reduction. In March 2022, the Navy added a test/training asset (XLE0) and test/ fix/test level of effort (LOE) period to reduce risk of achieving performance requirements and future delivery schedule of the JEON vehicles.					
FY 2023 Plans: Continue risk reduction testing and commence test/fix/test period using XLE0. Complete Phase 2 fabrication and integration of Vehicle 1. Continue Phase 2 fabrication and integration of vehicles 2-5. Continue additional XLUUV technologies/ capabilities risk reduction leveraging the competitive Industrial base. Commence Fleet training and prepare for initial Navy testing. Begin subsystem testing for payload integration. Continue efforts and infrastructure development to support XLUUV basing, testing, training, fleet integration and CONOPs.					
FY 2024 Base Plans: Complete risk reduction testing and test/fix/test period using XLE0. Complete Phase 2 fabrication of Vehicles 2-5. Conduct contractor testing to verify system requirements on Vehicle 1-5, prepare systems for Government testing, and initiate execution of Government Testing and related fleet training. Fabrication contractor to provide					

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy		Date: March 2023
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0604536N / <i>Advanced Undersea Prototyping</i>	Project (Number/Name) 3394 / <i>Adv Undersea Prototyping-Vehicles, Propulsion & Navigation</i>

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
<p>support for test events including technical representatives and hardware to conduct events. Continue additional XLUUV technologies capabilities risk reduction leveraging the competitive Industrial base. Continue efforts and infrastructure development to support CONUS XLUUV basing, testing, training, fleet integration and CONOPs. Complete subsystem testing for payload integration to support fleet transition.</p> <p>FY 2024 OCO Plans: N/A</p> <p>FY 2023 to FY 2024 Increase/Decrease Statement: Decrease of \$19.628M due to the completion of fabrication and integration of Vehicles 2-5 in FY2024 Q3 and transition to developmental testing.</p>					
<p>Title: XLUUV Support</p> <p align="right">Articles:</p> <p>FY 2023 Plans: Support engineering and technical oversight of fabrication efforts and engineering services including engineering change proposals and risk mitigation studies. Review and approve CDRLs, design products, and manufacturing processes. Provide expert oversight and support of subsystem and system testing, including performing final system inspection and acceptance for vehicle 0. Provide support for Government testing planning efforts and continue safety certifications. Engage UUVRON to develop and document tactics, techniques, and procedures (TTPs) to create and validate Integrated Logistics Support products. Continue payload integration efforts.</p> <p>FY 2024 Base Plans: Support engineering and technical oversight of fabrication efforts and engineering services including engineering change proposals and risk mitigation studies. Review and approve CDRLs, test plans and procedures, and manufacturing processes. Provide expert oversight and support of subsystem and system testing, including performing final system inspection and acceptance for vehicle 1-5. Provide support for Government testing as well as Government-furnished facilities and test sites, and complete safety certifications. Government test support to include planning for and participating at multiple test events, including various Navy test range locations, including safety and range equipment. Continue to engage UUVRON to develop and document tactics, techniques, and procedures (TTPs) to validate Integrated Logistics Support products. Begin infrastructure development to support XLUUV OCONUS basing, fleet integration and in-theater forward</p>	15.366	30.908	46.178	0.000	46.178
	-	-	-	-	-

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy				Date: March 2023	
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0604536N / <i>Advanced Undersea Prototyping</i>		Project (Number/Name) 3394 / <i>Adv Undersea Prototyping-Vehicles, Propulsion & Navigation</i>	
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)					
operational capability, including support platforms, trailers, maintenance equipment, and ashore hardware. Complete payload integration efforts					
FY 2024 OCO Plans: N/A					
FY 2023 to FY 2024 Increase/Decrease Statement: Increase of \$15.27M due to vehicle inspection and acceptance of 4 vehicles, commencement of support for Government testing, validation of Integrated Logistics Support products, and OCONUS basing infrastructure development.					
Title: XLUUV Test and Evaluation					
Articles:					
	0.000	0.000	14.090	0.000	14.090
	-	-	-	-	-
FY 2023 Plans: N/A					
FY 2024 Base Plans: Fabrication contractor to provide support for test events including technical representatives and hardware to conduct events. Commence Navy developmental testing (DT) and related Fleet training. Government test support to include executing multiple test events at various Navy test range locations.					
FY 2024 OCO Plans: N/A					
FY 2023 to FY 2024 Increase/Decrease Statement: Increase of \$14.090M due to commencement of Developmental Testing (DT) at the Naval Base Ventura County site.					
Title: XLUUV Management Services					
Articles:					
	2.101	2.924	3.005	0.000	3.005
	-	-	-	-	-
FY 2023 Plans: Provide technical guidance, project planning, program management and travel for Orca fabrication. Provide financial and contracting support, and coordinate work with the Fleet, test support, engineering support, and contractors.					
FY 2024 Base Plans:					

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy		Date: March 2023
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0604536N / <i>Advanced Undersea Prototyping</i>	Project (Number/Name) 3394 / <i>Adv Undersea Prototyping-Vehicles, Propulsion & Navigation</i>

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Provide technical guidance, project planning, program management and travel for Orca fabrication and performance verification. Provide financial and contracting support, and coordinate work with the Fleet, test support, engineering support, and contractors. FY 2024 OCO Plans: N/A FY 2023 to FY 2024 Increase/Decrease Statement: Increase of \$0.081M due to minor adjustments in program management and technical project planning.					
Accomplishments/Planned Programs Subtotals	30.597	94.515	104.328	0.000	104.328

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

<u>Line Item</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024 Base</u>	<u>FY 2024 OCO</u>	<u>FY 2024 Total</u>	<u>FY 2025</u>	<u>FY 2026</u>	<u>FY 2027</u>	<u>FY 2028</u>	<u>Cost To Complete</u>	<u>Total Cost</u>
• OPN 1613: <i>Extra Large UUV</i>	0.000	0.000	0.000	-	0.000	0.000	113.306	115.572	117.884	Continuing	Continuing

Remarks

D. Acquisition Strategy

Orca XLUUV is a multi-phased accelerated acquisition effort using USC Sec. 2358 authorities to rapidly deliver capability to the Fleet. Phase 1 was a competitively sourced design effort. Two design contracts were awarded to Industry in FY 2017. Phase 2 commenced with a down select in FY 2019 to one of the Phase 1 vendors for fabrication and testing of the vehicle and support elements. Five (5) Orca XLUUV operationally relevant prototype systems (vehicles, mobile C2 equipment, and support equipment) are being fabricated for demonstration and use by the Fleet. An additional test and training asset (Vehicle 0) will be delivered to support early learning, prototyping, and in-water risk reduction testing. Additional XLUUV technologies/capabilities risk reduction will occur in parallel, leveraging the competitive Industrial base. Fabrication and award of additional Orca XLUUV systems is planned to be no earlier than FY26. Transition to an Acquisition Category (ACAT) Program and production may occur as early as FY26, pending successful completion of Government testing. XLUUV will have a modular payload bay with defined interfaces that current and future payloads must adhere to for employment from the vehicle. The Hammerhead payload is the next payload for integration with Orca XLUUV. Other potential future payloads, advanced energy solutions, and enhanced autonomy and command and control will be developed and evaluated under the Core Technologies PE 0604029N, and/or by other Science and technology organizations, and integrated into Orca XLUUV when ready. The Navy is concurrently updating facilities at the Naval Base Ventura County site for XLUUV testing, training, and work-ups, in coordination with large unmanned surface vessel testing for cost efficiencies. In parallel, the Navy is working through the process to establish future far-forward basing locations. Following successful Government testing, training, and work-ups at the Naval Base Ventura County site, the Navy will establish in-theater forward operational capability.

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy												Date: March 2023			
Appropriation/Budget Activity 1319 / 4				R-1 Program Element (Number/Name) PE 0604536N / Advanced Undersea Prototyping				Project (Number/Name) 3394 / Adv Undersea Prototyping-Vehicles, Propulsion & Navigation							
Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Payload Design documentation	C/CPIF	Various : Various	3.735	0.000		0.000		0.000		-		0.000	0.000	3.735	-
Design & Long Lead Material, including sub-systems	C/CPIF	Boeing : Huntington Beach, CA	49.558	0.000		0.000		0.000		-		0.000	0.000	49.558	-
Design & Long Lead Material, including sub-systems	C/CPIF	Lockheed Martin : Riviera Beach, FL	43.349	0.000		0.000		0.000		-		0.000	0.000	43.349	-
Fabrication of XLUUVs	C/FPIF	Boeing : Huntington Beach, CA	281.726	11.106	Dec 2021	48.698	Dec 2022	30.002	Dec 2023	-		30.002	Continuing	Continuing	Continuing
XLUUV Spares/Maintenance	C/CPIF	Boeing : Huntington Beach, CA	0.000	0.609	Dec 2021	3.932	Dec 2022	7.349	Dec 2023	-		7.349	Continuing	Continuing	Continuing
Test support, hardware and support equipment	C/CPFF	Boeing : Huntington Beach, CA	1.690	1.415	Dec 2021	8.053	Dec 2022	3.704	Dec 2023	-		3.704	Continuing	Continuing	Continuing
Subtotal			380.058	13.130		60.683		41.055		-		41.055	Continuing	Continuing	N/A
Support (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
RFP/PSPED Dev	SS/CPFF	APL/JHU : Laurel, MD	0.300	0.000		0.000		0.000		-		0.000	0.000	0.300	-
Source Selection	WR	NSWC CD : West Bethesda, MD	1.518	0.000		0.000		0.000		-		0.000	0.000	1.518	-
Source Selection	WR	SSC PAC : San Diego, CA	0.517	0.000		0.000		0.000		-		0.000	0.000	0.517	-
Engineering Support	WR	NSWC CD : West Bethesda, MD	5.426	1.317	Nov 2021	5.487	Dec 2022	4.664	Nov 2023	-		4.664	Continuing	Continuing	Continuing
Test Support	WR	NSWC CD : West Bethesda, MD	1.100	0.722	Dec 2021	1.918	Dec 2022	2.110	Dec 2023	-		2.110	Continuing	Continuing	Continuing
Engineering Support	WR	NSWC IH : Indian Head, MD	4.563	0.880	Nov 2021	1.032	Dec 2022	0.877	Nov 2023	-		0.877	Continuing	Continuing	Continuing

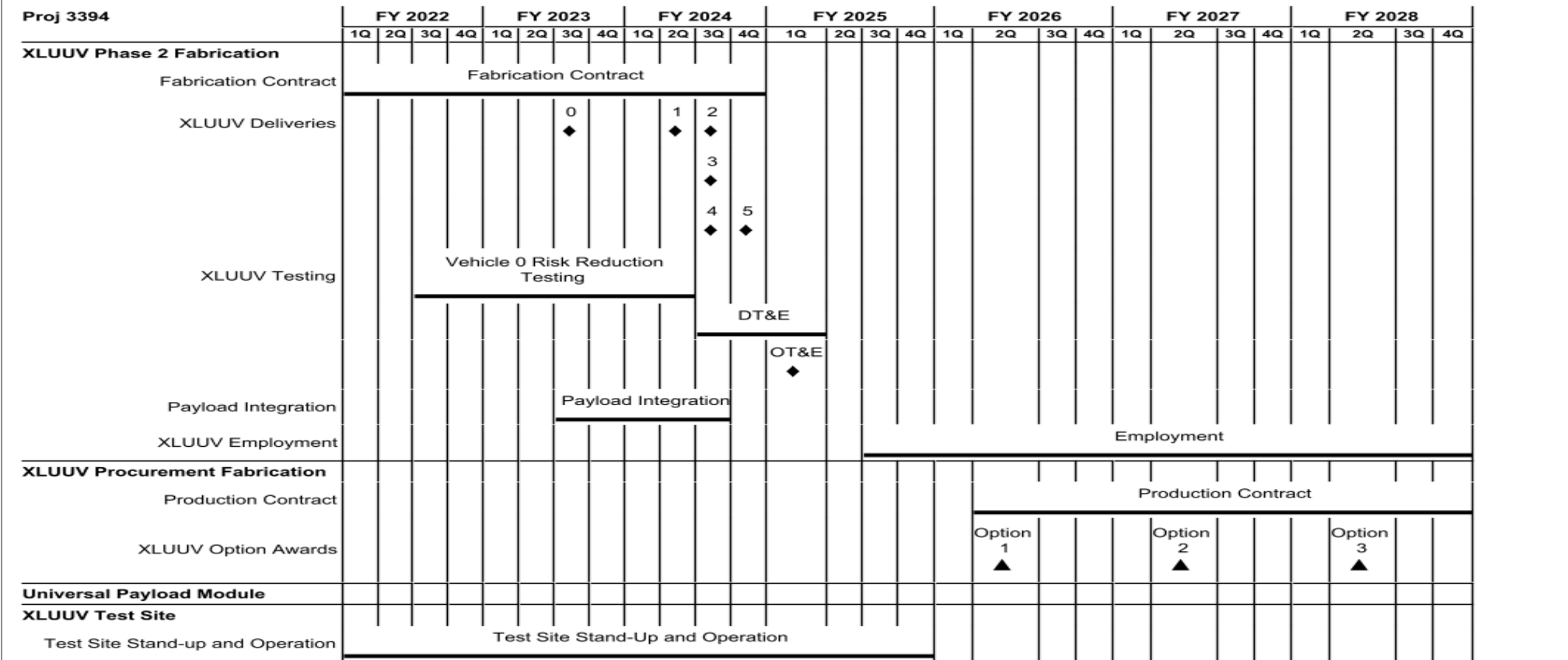
UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy												Date: March 2023			
Appropriation/Budget Activity				R-1 Program Element (Number/Name)				Project (Number/Name)							
1319 / 4				PE 0604536N / Advanced Undersea Prototyping				3394 / Adv Undersea Prototyping-Vehicles, Propulsion & Navigation							
Support (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Test safety support	WR	NSWC IH : Indian Head, MD	0.000	0.173	Dec 2021	0.288	Dec 2022	0.432	Dec 2023	-		0.432	Continuing	Continuing	Continuing
Engineering and Logistic Support	WR	NUWC KPT : Keyport, WA	6.601	1.802	Nov 2021	4.750	Dec 2022	5.515	Nov 2023	-		5.515	Continuing	Continuing	Continuing
Technical Warrant Holder Support	Various	NAVSEA Activities : Washington, DC	1.702	0.280	Nov 2021	0.935	Dec 2022	0.842	Nov 2023	-		0.842	Continuing	Continuing	Continuing
Program Support	Various	Various : Various	13.096	1.782	Nov 2021	2.868	Dec 2022	2.581	Nov 2023	-		2.581	Continuing	Continuing	Continuing
OCONUS Basing Equipment	Various	Various : Various	0.000	0.000		0.000		20.700	Nov 2023	-		20.700	Continuing	Continuing	Continuing
Test Support	WR	Naval Base Ventura County : Port Hueneme, CA	0.000	1.190	Dec 2021	2.804	Dec 2022	4.281	Dec 2023	-		4.281	Continuing	Continuing	Continuing
Test Ranges and Support equipment	WR	Various : Various	0.000	0.593	Dec 2021	1.740	Dec 2022	4.176	Dec 2023	-		4.176	Continuing	Continuing	Continuing
XLUVV Test Site	WR	Naval Base Ventura County : Point Mugu, CA	0.000	6.627	Dec 2021	9.086	Dec 2022	0.000		-		0.000	0.000	15.713	-
Subtotal			34.823	15.366		30.908		46.178		-		46.178	Continuing	Continuing	N/A
Test and Evaluation (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Developmental Test & Evaluation (DT&E)	WR	Naval Base Ventura County : Point Mugu, CA	0.000	0.000		0.000		14.090	Mar 2024	-		14.090	0.000	14.090	-
Subtotal			0.000	0.000		0.000		14.090		-		14.090	0.000	14.090	N/A

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: PB 2024 Navy **Date:** March 2023

Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0604536N / <i>Advanced Undersea Prototyping</i>	Project (Number/Name) 3394 / <i>Adv Undersea Prototyping-Vehicles, Propulsion & Navigation</i>
--	--	--



UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: PB 2024 Navy		Date: March 2023
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0604536N / <i>Advanced Undersea Prototyping</i>	Project (Number/Name) 3394 / <i>Adv Undersea Prototyping-Vehicles, Propulsion & Navigation</i>

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Proj 3394				
XLUUV Phase 2 Fabrication: Fabrication Contract: Fabrication Contract	1	2022	4	2024
XLUUV Phase 2 Fabrication: XLUUV Deliveries: Delivery System 0	3	2023	3	2023
XLUUV Phase 2 Fabrication: XLUUV Deliveries: Delivery System 1	2	2024	2	2024
XLUUV Phase 2 Fabrication: XLUUV Deliveries: Delivery Systems 2	3	2024	3	2024
XLUUV Phase 2 Fabrication: XLUUV Deliveries: Delivery Systems 3	3	2024	3	2024
XLUUV Phase 2 Fabrication: XLUUV Deliveries: Delivery System 4	3	2024	3	2024
XLUUV Phase 2 Fabrication: XLUUV Deliveries: Delivery System 5	4	2024	4	2024
XLUUV Phase 2 Fabrication: XLUUV Testing: Vehicle 0 Risk Reduction Testing	3	2022	2	2024
XLUUV Phase 2 Fabrication: DT&E	3	2024	1	2025
XLUUV Phase 2 Fabrication: OT&E	1	2025	1	2025
XLUUV Phase 2 Fabrication: Payload Integration: Integration	3	2023	3	2024
XLUUV Phase 2 Fabrication: XLUUV Employment:	3	2025	4	2028
XLUUV Procurement Fabrication: Production Contract: Production	2	2026	4	2028
XLUUV Procurement Fabrication: XLUUV Option Awards: Additional system option 1	2	2026	2	2026
XLUUV Procurement Fabrication: XLUUV Option Awards: Additional system option 2	2	2027	2	2027
XLUUV Procurement Fabrication: XLUUV Option Awards: Additional system option 3	2	2028	2	2028
XLUUV Test Site: Test Site Stand-up and Operation: XLUUV Test Site:	1	2022	4	2025