AMENDMENT OF SOLICITATION/MODIFICATION OF CONTRACT

1. CONTRACT ID CODE	PAGE OF PAGES
	1 | 8

2. AMENDMENT/MODIFICAITON NO.	3. EFFECTIVE DATE	4. REQUISITION/PURCHASE REQ. NO.	5. PROJECT NO. *(If applicble)*
04	03/08/2023		

6. ISSUED BY	CODE	7. ADMINISTERED BY *(If other than Item 6)*	CODE
DLA Contracting Services Office - Philadelphia 700 Robbins Ave. Philadelphia, PA 19111 Attn: R&D CONTRACTING TEAM	SP4701	SAME AS BLOCK 6	

8. NAME AND ADDRESS OF CONTRACTOR *(No., street, county, State and ZIP Code)*	(X)	9A. AMENDMENT OF SOLICIATION NO.
	☒	BAA0001-22
		9B. DATED *(SEE ITEM 11)* 06/13/2022
	☐	10A. MODIFICATION OF CONTRACT/ORDER NO.
		10B. DATED *(SEE ITEM 13)*

CODE	FACILITY CODE

11. THIS ITEM ONLY APPLIES TO AMENDMENTS OF SOLICITATIONS

☒ The above numbered solicitation is amended as set forth in Item 14. The hour and date specified for receipt of Offers ☐ is extended, ☒ is not extended.

Offers must acknowledge receipt of this amendment prior to the hour and date specified in the solicitation or as amended, by one of the following methods: (a)By completing items 8 and 15, and returning _____ copies of the amendment; (b) By acknowledging receipt of this amendment on each copy of the offer submitted; or (c) By separate letter or telegram which includes a reference to the solicitation and amendment numbers. FAILURE OF YOUR ACKNOWLEDGMENT TO BE RECEIVED AT THE PLACE DESIGNATED FOR THE RECEIPT OF OFFERS PRIOR TO THE HOUR AND DATE SPECIFIED MAY RESULT IN REJECTION OF YOUR OFFER. If by virtue of this amendment your desire to change an offer already submitted, such change may be made by telegram or letter, provided each telegram or letter makes reference to the solicitation and this amendment, and is received prior to the opening hour and date specified.

12. ACCOUNTING AND APPROPIRATION DATA *(If required)*

13. THIS ITEM ONLY APPLIES TO MODIFICATION OF CONTRACTS/ORDERS. IT MODIFIES THE CONTRACT/ORDER NO. AS DESCRIBED IN ITEM 14.

CHECK ONE	
☐	A. THIS CHANGE ORDER IS ISSUED PURSUANT TO: *(Specify authority)* THE CHANGES SET FORTH IN ITEM 14 ARE MADE IN THE CONTRACT ORDER NO. IN ITEM 10A.
☐	B. THE ABOVE NUMBERED CONTRACT/ORDER IS MODIFIED TO REFLECT THE ADMINISTRATIVE CHANGES *(such as changes in paying office, appropriation date, etc.*) SET FORTH IN ITEM 14, PURSUANT TO THE AUTHORITY OF FAR 43.103(b).
☐	C. THIS SUPPLEMENTAL AGREEMENT IS ENTERED INTO PURSUANT TO AUTHORITY OF:
☐	D. OTHER *(Specify type of modification and authority)*

E. IMPORTANT: Contractor ☐ is not, ☐ is required to sign this document and return _____ copies to the issuing office.

14. DESCRIPTION OF AMENDMENT/MODIFICATION (*Organized by UCF section headings, including solicitation/contract subject matter where feasible.)*

The purpose of this amendment it to add Area of Interest P. Flake Graphite-Based Solutions for Per and Polyfluorinated Substances (PFAS) Contamination found in Attachment B. See following pages for details.

Except as provided herein, all terms and conditions of the document referenced in Item 9A or 10A, as heretofore changed, remains unchanged and in full force and effect.

15A. NAME AND TITLE OF SIGNER *(Type or print)*		16A. NAME AND TITLE OF CONTRACTING OFFICER *(Type or print)*	
15B. CONTRACTOR/OFFEROR *(Signature of person authorized to sign)*	15C. DATE SIGNED	16B. UNITED STATES OF AMERICA *(Signature of Contracting Officer)*	16C. DATE SIGNED

ATTACHMENT B: AREAS OF INTEREST (Revised)

**Please note: Due to security concerns with use of sensitive DLA data, projects that include processing of DLA data will be required to do so either (a) in the DLA R&D Azure cloud environment, or (b) on standalone computers with no internet access provided as Government Furnished Equipment (GFE) using data provided by DLA on CD-ROM media. No other access to DLA data will be allowed without a waiver from the DLA Chief Data Officer.*

As of this BAA's posting date, DLA will consider White Papers submitted in response to this BAA in the following Areas of Interest:

A. Medical Logistics

Research shall focus on solutions to identify and resolve medical logistics support challenges at low cost. The research may leverage existing commercial capabilities that will integrate commercial supply chain best practices and help forge strategic partnerships with critical customers, manufacturers, suppliers, and other Federal government stakeholders and industry groups. The research must enhance medical logistics capabilities in both peacetime and operational environments. Research is limited to non-pharmaceutical classes and shall be directed to the following subtopics: (i) Data analytics and operational intelligence capabilities (ii) Fair and reasonable pricing of products in the supply chain (iii) Clinical standardization of medical products.

B. Distribution

DLA Distribution seeks research efforts focused on integration of new ideas, new business practices, and innovative commercial technologies into the DLA Distribution operational environment, particularly – but not exclusively – solutions that apply autonomous equipment, robotics, network-linked devices, etc. Solutions should focus on improvements to one or more of (i) inventory management, (ii) materiel distribution, or (ii) asset visibility. Solutions should include (i) testing and evaluation of the use of commercial technologies with an application to DLA Distribution, (ii) verification that the technologies perform as expected, and (iii) validating whether the technology meets the operational needs of the user.

C. Advanced Manufacturing

DLA seeks innovative ideas in several areas related to the use of advanced manufacturing – including additive manufacturing (AM) – in the DLA supply chain.
Suitable projects under this Area of Interest may include:

1. AM projects that address (a) the costs, transfer, and the use of intellectual property for AM technical data management in acquisition, sustainment, and maintenance; (b) digital verification and validation (including measures of effectiveness and key performance parameters) of AM technical data and first article testing that compare polymers and metals, and critical and non-critical items; or (c) use of digital thread to maintain a consistent AM product from design through qualification and acceptance.
2. Advanced manufacturing R&D projects that address new paradigms, methods, processes, or equipment for new or existing manufacturing products, materials, or supply chain components and that provide an advantage over existing techniques or tools. In this context, advantages include reduced time to market, enabling new performance attributes, improving small-batch production, cost savings, energy savings, or reduced environmental impact from the manufacturing of products.

D. Emerging Technologies to Enhance Part, Component and Logistical Product Data Granularity, Availability and Interoperability

Research must focus on developing solutions that support DoD's Digital Engineering Strategy and DigitalModernization efforts for DLA by:

- using digital data in place of documents as the authoritative source of technical data;
- extending the model-based approach by incorporating digital engineering technologies andpractices that connect business and technical data such as artificial intelligence, augmentedrealities, digital twin, and machine learning;
- providing a standards-based open system IT infrastructure that enables the digital thread, distributed manufacturing, advanced methods for cybersecurity, and protection of intellectual property; and preparing the workforce for change management and strategic communications necessary totransform DLA use of digital data.

E. Smart Connected Logistics

The Internet of Things (IoT) is often viewed as a network of linked devices. Each device is a smart, connected product characterized by its "awareness" of its state and its ability to communicate with other important "things" in its environment. Connectivity amplifies the awareness and enables the device to beconnected to many other devices and sources of data. DLA seeks projects that address connecting devicesand users or systems to the data necessary to provide "cradle to grave" logistical sustainment; for example,the technology to acquire and organize the vast amount of data that will be supplied by these devices. Thedata must be transformed so it is coherent, relevant, and actionable by humans and machine-to-machine or system-to-system interfaces. To accomplish this, DLA expects a standard or open source protocol solution that addresses a specific challenge that DLA currently faces. The data acquired from IoT deviceswill be independent from the constraints of the device suppliers or any singular data aggregator.

F. Anti-counterfeiting Technical Solution

Numerous reports and investigations have documented that there are counterfeit parts in DOD's Supply Chain. In response to the threat, DLA is seeking research that focuses on providing a single low-cost anti-counterfeiting technical solution that can authenticate items in multiple Federal Supply Classes (FSCs) supporting various DLA supply chains. At a minimum, the single low-cost anti-counterfeiting technical solution must be effective in preventing counterfeits by authenticating items in all of the following FSCs:

a. FSC 5961 Semiconductor Devices
b. FSC 5962 Microcircuits
c. FSC 5935 Electrical Connectors
d. FSC 4730 Fittings Hose, Pipe and Tube
e. FSC 3110 Bearings, Anti-friction, Unmounted
f. FSC 3120 Bearings, Plain, Unmounted

g. FSC 2530 Vehicle Brake, Steer Axle, Wheel and Track Components
h. FSC 2940 Engine Air and Oil Filters, Non-Aircraft
i. FSC 2910 Engine Fuel System Components Non-Aircraft
j. FSC 1680 Miscellaneous Aircraft Accessories and Components
k. FSC 5330 Gaskets
l. FSC 5331 O-Rings

The research must also detail how the technical solution will be integrated into the supply chains of DLAsuppliers (i.e., manufacturers, authorized distributions and independent distributors), the impact on the supply chains of implementing the technical solution, and the probability that DLA suppliers will adopt the technical solution.

G. Energy Research Program

Research shall focus on developing improvements to the DoD Class III Bulk Fuel Petroleum, Oil and Lubricants (POL) supply system. The research may include areas addressing, but not limited to, the following:

- improvements to military acquisition specifications for POL, aerospace fuels/propellantsand related products (e.g. additives);
- development of new analytical methods, or improvements to existing methods, designed todetermine product quality or identify anomalies;
- enhancing military adoption and use of fuel products derived from alternatives to petroleum;
- development of renewable energy technologies (e.g. wind, solar, hydro, geothermal) formilitary and government use;
- improvements to DoD fuel storage, handling and distribution systems;
- correction of known operational equipment issues connected to specification fuel use.

H. Artificial Intelligence/Machine Learning Applications

Responses shall focus on artificial intelligence (AI) or machine learning (ML) applications to aid in planning, acquisition, and technical/quality processes across the DLA Enterprise. The research may leverage commercial best-in-class concepts and practices that will integrate existing data and metrics withvarious AI or ML tools to provide narrowly focused solutions to specific challenges. ***Due to security concerns with use of sensitive DLA data, projects that include processing of DLA data will be requiredto do so either (a) in the DLA R&D Azure cloud environment, or (b) on standalone computers with no***

internet access provided as Government Furnished Equipment (GFE) using data provided by DLA onCD-ROM media. No other access to DLA data will be allowed without a waiver from the DLA Chief Data Officer.

Research shall be directed to one or more of the following subtopics:

- Business decision analytics
- Demand forecasting & inventory optimization

- Production lead time planning
- Supplier selection & supplier relationship management
- Contract drafting, execution, & management
- Diminishing manufacturing sources & material shortages
- Risk identification & management
- Counterfeit detection & avoidance
- eCommerce
- Cybersecurity

I. Strategic Materials

Need for this research stems from emerging and rapidly expanding requirements to restore and stabilize strategic and critical materials supply chains that have been compromised by decreased or abandoned domestic mining and refining activities or lack of domestic manufacturing. The research could include material and production process substitutes or drop-in replacements to relieve (1) a single point of failure in a supply chain, (2) dependence upon unreliable foreign sources of supply, or (3) replacement of a legacy or obsolete material. These requirements can address virtually any critical or strategic materials but DLA is primarily interested in:

- **Energetic Materials** - Materials and production processes that increase the range, lethality, or safety of propellants, pyrotechnics, explosives, and initiating compositions used in ammunition.
- **Energy and Power Materials** - Materials that increase the energy density or safety of batteries in nuclear weapon systems, national security space systems, or commercial items incorporated into components utilized by a DoD nuclear or space program of record.
- **Aeronautical and Astronautical Materials** - Metals, alloys, fibers, composites, or processes (e.g., heat treat) for such materials that would allow for new material systems to be used in existing aerospace applications. Materials and production processes that achieve current design requirements with a reduction in production steps or lead time.
- **Armor Materials** - Materials, including textiles, that decrease the weight of armor systems with like or improved ballistic performance, as well as combine ballistic protection with other forms of defense (e.g., chemical, biological, radiological, nuclear).
- **Stable Isotopes** - Materials and production processes that increase the safety or efficiency of nuclear reactor coolant and waste storage systems.
- **Paints, Coatings and Surface Treatments** - Materials that improve corrosion resistance or provide like corrosion resistance with a decrease in weight, coating thickness, surface treatments, or use of hazardous materials. Materials with combined protection capabilities (e.g., ultra-violet, chemical, electro-magnetic) to reduce the weight or thickness of coatings or reduce the number of required coatings.
- **Mining** - Analyses of the origin of materials tapped and untapped with respect to geographic proximity, proximity to refiners or processors and geopolitical control in the source regions. Surveys and assessments of the character and condition of existing mines, including level of sophistication, age, efficiency, output, and ownership/controls. Analyses of the quantities of materials remaining to be recovered from active mines. Assessments of regions that have known deposits where new mining operations could be established; include consideration of economic and

geopolitical conditions.

- **Refining and Processing** - Surveys and assessments of international and domestic refining and processing facilities; including plant locations, size, normal and maximum production capacity, proximity to mines, storage capabilities, access to transportation hubs, and types of transportation. Research, assess and evaluate emerging processes to enhance the quality of materials, improve efficiency of production processes, or mitigate recurring problems.
- **Recycling, Conservation and Substitution Options –** Identify, evaluate, and qualify material substitutes in active use by domestic and international processors and manufacturers; include limitations and common issues associated with use of the substitute material. Identify and evaluate active and potential recycling opportunities, including industrial infrastructure and logistical perceived limitations.
- **Permanent Magnet Recycling –** Research on recycling methods for neodymium iron boron (NdFeB) magnets or recovery of rare earths or their alloys. Efforts should include identifying the energy magnetic density of the recycled magnets and their defense or essential civilian application areas.
- **Permanent Magnet Manufacturing –** Research on novel manufacturing methods for iron nitride (FeN) magnets to improve efficiency of production processes or mitigate recurring processing problems. Efforts should include identifying the energy magnetic density of the FeN magnets and their application areas for defense or essential civilian."

J. Castings and Forgings

Much of DLA's technical data is contained in a few different formats and locations. For instance, the data may be located in text fields in the Total Item Record or within 2-D raster format drawings. Those text fields and drawings can be difficult or time consuming to search and extract needed information on a large scale, especially without the use of automated methods. Since some procurement related decisions are made from that key technical information, it's important to obtain comprehensive, varying data at different times. DLA seeks to develop automated methods to search these types of databases and documents to extract needed information related to cast and/or forged parts on a large scale. Needed information may include the materials, processes, specifications, standards, etc. related to cast and/or forged parts.

K. Lithium Battery Deactivation

End of life rechargeable and non-rechargeable lithium batteries are currently handled and transported as hazardous waste. These batteries must be shipped according to international shipping regulations and packaging requirements, thereby incurring significant transportation and processing cost for their disposal. DLA seeks projects to implement a preferred lithium battery deactivation technology at key Continental U.S. (CONUS) and Outside the Continental U.S. (OCONUS) locations. The goal is to install and commission local pilot processes to deactivate lithium batteries received from U.S. military installations for the purpose of recycling non-hazardous materials locally and shipping valuable battery materials back to the U.S. for further direct recycling. Projects will utilize already developed deactivation and partial disassembly technology designed for lithium-ion and primary lithium military batteries, and include cost-share of all equipment costs – mobile, expeditionary systems are preferred. Projects will include collaboration with deactivation technology provider, identification of operational locations, training, transportation, setup and operation of equipment for the collection and

processing of batteries for a period up to one year.

L. Blockchain Logistics

Blockchain has become more than just a digital distributed ledger that is used for cryptocurrency. Blockchain has become a system of recording information in ways that makes it difficult or impossible to change, hack, or cheat the system. Within the supply chain blockchain can now be used to provide all parties within the supply chain with access to the same information which reduces communication or transfer data errors. Research in this area shall focus on ways to enable DLA to increase efficiency through process automation, transparency, traceability, and transaction verification more efficient. Research shall also focus on using this technology in order to make the supply chains more secure as the origin and authenticity of the data and products shared and providing a more secure means of collaboration between DLA and its customers and partners."

M. Edge Computing

Edge computing is unique in that, data is processed by the device itself or by a local computer or server, rather than being transmitted to a data center. Edge computing is important because it creates and improves ways for industrial and enterprise-level businesses to maximize operational efficiency, improve performance and safety, automate all core business process, and ensures availability at all times. Research in this area shall focus on the ability to digitally connect and automate DLA processes at the edge and allow for organizations within DLA to extend the reach and visibility of their supply chains. Research will also focus on using edge computing to reduce the amount of sensitive data that must be transmitted over networks and how to reduce supply chain vulnerabilities by reducing congestion within the DLA network.

N. Acquisition Modernization Technology Research (AMTR)

DLA's AMTR Program researches current acquisition and procurement systems and processes, identifies capability gaps, and prioritizes areas that would benefit from modernization. The goal is to introduce advanced tools and technologies to align existing business processes with commercial and government best practices. Identified strategic focus areas include:

a. Applying Innovative Processes (such as e-commerce, intellectual property management, 3D tech data, etc.)
b. Integrating Data Science and Analytics (tool(s) to improve source selection, procurement forecasts, etc.)
c. Capitalizing on Emerging Technology (such as digital engineering, AI/ML, blockchain, etc.)
d. Maximize Enterprise IT Modernization (through a DLA employee dashboard, automating parts of contract management, etc.)
e. Deepening Industry Engagement for Innovation (through advanced solicitation methods, finding ways to improve customer experience etc.)
f. Strengthening our Knowledge-Rich Acquisition Workforce (through AI-assisted learning, advanced training management, etc.)

O. Human—Machine Teaming Technologies for Disposition Warehouse Management

Response must focus on various ways to help ensure worker's safety, efficiencies, and effectiveness in disposition warehouses by automating repetitive and mundane tasks and provide data on improved performance. The labor-saving devices must demonstrate a significant increase in improving disposal

efficiencies, automated material transport within the warehouse, tracking and tracing of returned materials, the rate of palletizing and depalletizing of large containers and off-loading of trucks. The technology must help prevent overexertion among human workers involved in lifting, moving, bending, stooping and synchronize well with human centered activities and business processes. Solutions must work autonomously in cleaning and vacuuming floors while neatly avoiding walls and obstacles. The technology must enable production efficiency simulations that reduce disorganization and unnecessary complexity in disposition warehouse planning and operations.

P. Flake Graphite-Based Solutions for Per and Polyfluorinated Substances (PFAS) Contamination

Description: The 2020 National Defense Authorization Act (NDAA) directed that Aqueous Film Forming Foams (AFFF) fire suppressants, due to the dangers the material poses to the environment and human health, must be replaced by a safer, more environmentally benign fire suppressant by October 1, 2024. DLA's research in this area shall focus on flake graphite foam formulation, qualifying the standards as defined in the military specifications, and testing of graphite-one sourced foam that can extinguish Class B fires. This work funded by FY23 Congressionally Directed Funds (CDF) will aim to meet the mandated replacement of AFFF fire suppressants per the 2020 NDAA due to the hazards that PFAS contamination poses to the environment.

All other terms and conditions remain unchanged.