

Final

**Work Plan**  
**Time-Critical Removal Action**  
**Munitions and Explosives of**  
**Concern Surface Sweep**  
**Operations**  
**Operable Unit 9**  
**Formerly Used Defense Sites**  
**Project 7 Boat Basin/Visitor Center**

Goddard Space Flight Center  
Wallops Flight Facility  
Wallops Island, Virginia

June 2022

**Signature Page**

**Work Plan for  
Time-Critical Removal Action,  
Munitions and Explosives of Concern Surface Sweep Operations**

**Operable Unit 9  
Formerly Used Defense Sites  
Project 7 Boat Basin/Visitor Center**


**Goddard Space Flight Center  
Wallops Flight Facility  
Wallops Island, Virginia**

**Submitted to:  
National Aeronautics and Space Administration Wallops Flight Facility  
Wallops Island, Virginia 23337**

**Submitted by:  
KOMAN Government Solutions, LLC  
180 Gordon Drive, Suite 110  
Exton, PA 19341**

**CONTRACT NO. 80GSFC21CA0008  
Contract Task Order No. 20**

**June 2022**

|                     |  |                              |
|---------------------|--|------------------------------|
| Review Signature:   | <br>_____<br>Steve Deeter<br>KGS / Project Manager | <u>23 May 2022</u><br>Date   |
| Approval Signature: | _____<br>Marianne Simko<br>Bluestone Environmental Group   | <u>June 13, 2022</u><br>Date |

# CERTIFICATION

I certify that the information contained in or accompanying this document is true, accurate and complete.

As to any portion of this document for which I cannot personally verify its accuracy, I certify under penalty of law that this document and all attachments were prepared in accordance with procedures designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry to the person or persons who manage the system, or those persons directly responsible for gathering the information, or the immediate supervisor of such person(s), the information submitted is to the best of my knowledge and belief true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fines and imprisonment for knowing violations.

**Signature:** \_\_\_\_\_

**Name:** David Liu  
\_\_\_\_\_

**Title:** NASA Project Coordinator  
\_\_\_\_\_

## TABLE OF CONTENTS

|  |          |
|--|----------|
| SIGNATURE PAGE .....   | i        |
| CERTIFICATION .....  | ii       |
| TABLE OF CONTENTS .....                                      | iii      |
| LIST OF FIGURES .....  | v        |
| LIST OF TABLES.....  | v        |
| ACRONYMS AND ABBREVIATIONS .....                             | vi       |
| <b>1.0 INTRODUCTION.....</b>                                 | <b>1</b> |
| 1.1 PROJECT OBJECTIVES .....                                 | 1        |
| 1.2 SITE CONDITIONS AND BACKGROUND.....                      | 1        |
| 1.2.1 Site Layout .....                                      | 2        |
| 1.2.2 Historical Site Use .....                              | 2        |
| 1.2.3 Site Characteristics .....                             | 2        |
| 1.3 REGULATORY HISTORY TO DATE .....                         | 3        |
| 1.3.1 Previous Actions .....                                 | 3        |
| 1.3.2 Current Actions .....                                  | 5        |
| 1.3.3 Site-Specific Dynamic Events.....                      | 5        |
| 1.3.4 Potential Worker Hazards .....                         | 5        |
| 1.4 WORK PLAN ORGANIZATION .....                             | 6        |
| <b>2.0 TECHNICAL MANAGEMENT PLAN .....</b>                   | <b>7</b> |
| 2.1 APPLICABLE GUIDANCE AND REGULATIONS.....                 | 7        |
| 2.2 TECHNICAL SCOPE .....                                    | 7        |
| 2.2.1 Performance Standards .....                            | 7        |
| 2.2.2 UXO Surface Sweep .....                                | 7        |
| 2.3 CHANGED SITE CONDITIONS.....                             | 8        |
| 2.4 UXO SURVEY INSTRUMENTATION .....                         | 8        |
| 2.5 PROJECT ORGANIZATION .....                               | 9        |
| 2.5.1 Project Schedule .....                                 | 9        |
| 2.5.2 Submittals .....                                       | 10       |
| 2.6 PERSONNEL.....   | 12       |
| 2.6.1 Project Manager.....                                   | 12       |
| 2.6.2 Field Operations Leader .....                          | 12       |
| 2.6.3 Senior UXO Supervisor .....                            | 12       |
| 2.6.4 UXO Safety Officer/UXO Quality Control Specialist..... | 13       |
| 2.6.5 UXO Team Leader (UXO Tech III) .....                   | 14       |
| 2.6.6 UXO Technicians (UXO Tech II or I) .....               | 14       |
| 2.7 MOBILIZATION AND SITE PREPARATION .....                  | 14       |
| 2.7.1 Site Accessibility and Traffic Control .....           | 14       |
| 2.7.2 Site Security .....                                    | 14       |
| 2.7.3 Unexploded Ordnance Escort .....                       | 14       |

|            |   |           |
|------------|---|-----------|
| 2.7.4      | Boundaries.....                                   | 15        |
| 2.7.5      | UXO Surface Sweep.....                            | 16        |
| 2.8        | MUNITIONS DEBRIS MANAGEMENT AND DISPOSAL.....     | 17        |
| 2.9        | LESSONS LEARNED.....                              | 17        |
| <b>3.0</b> | <b>EXPLOSIVES MANAGEMENT PLAN.....</b>            | <b>18</b> |
| 3.1        | GENERAL REQUIREMENTS AND LICENSING.....           | 18        |
| 3.2        | EXPLOSIVES ACQUISITION AND MANAGEMENT.....        | 18        |
| 3.2.1      | Acquisition.....                                  | 18        |
| 3.2.2      | Initial Receipt.....                              | 18        |
| 3.2.3      | Storage.....                                      | 19        |
| 3.2.4      | Transportation.....                               | 19        |
| 3.2.5      | Receipt Procedures.....                           | 19        |
| 3.2.6      | Inventory.....                                    | 19        |
| 3.2.7      | Forms and Documents.....                          | 19        |
| <b>4.0</b> | <b>EXPLOSIVES SITING PLAN.....</b>                | <b>20</b> |
| 4.1        | ORDNANCE AND EXPLOSIVES AREAS.....                | 20        |
| 4.2        | PLANNED OR ESTABLISHED DEMOLITION AREAS.....      | 20        |
| 4.3        | BLOW-IN-PLACE.....                                | 20        |
| 4.4        | COLLECTION POINTS.....                            | 20        |
| 4.5        | IN-GRID CONSOLIDATED SHOTS.....                   | 20        |
| 4.6        | EXPLOSIVES STORAGE MAGAZINES.....                 | 20        |
| 4.7        | QUALITY CONTROL.....                              | 21        |
| 4.8        | EQUIPMENT STANDARDIZATION.....                    | 21        |
| 4.9        | ANOMALY AVOIDANCE.....                            | 23        |
| 4.10       | DATA COLLECTION VARIABLES.....                    | 23        |
| 4.11       | DATA ANALYSIS AND INTERPRETATION.....             | 23        |
| 4.12       | REACQUISITION.....                                | 23        |
| 4.13       | RECORDS MANAGEMENT.....                           | 23        |
| 4.14       | RECORDS MANAGEMENT.....                           | 24        |
| 4.15       | REPORTING.....                                    | 24        |
| 4.16       | COMPLETION REPORT.....                            | 24        |
| <b>5.0</b> | <b>GEOPHYSICAL PROVE-OUT PLAN AND REPORT.....</b> | <b>25</b> |
| <b>6.0</b> | <b>GEOPHYSICAL INVESTIGATION PLAN.....</b>        | <b>26</b> |
| <b>7.0</b> | <b>LOCATION SURVEYS AND MAPPING PLAN.....</b>     | <b>27</b> |
| 7.1        | SITE GRID.....                                    | 27        |
| 7.2        | UNEXPLODED ORDNANCE SAFETY PROVISION.....         | 27        |
| <b>8.0</b> | <b>WORK, DATA, AND COST MANAGEMENT PLAN.....</b>  | <b>28</b> |
| <b>9.0</b> | <b>PROPERTY MANAGEMENT PLAN.....</b>              | <b>29</b> |

|  |           |
|--|-----------|
| <b>10.0 CONTRACTOR QUALITY CONTROL PLAN .....</b>                        | <b>30</b> |
| 10.1 PROJECT ORGANIZATION AND RESPONSIBILITIES .....                     | 30        |
| 10.2 QUALITY REQUIREMENTS .....  | 30        |
| 10.3 FIELD DOCUMENTATION .....   | 31        |
| 10.4 AUDITS .....  | 33        |
| <b>11.0 ENVIRONMENTAL PROTECTION PLAN .....</b>                          | <b>34</b> |
| <b>12.0 INVESTIGATIVE DERIVED WASTE PLAN .....</b>                       | <b>35</b> |
| <b>13.0 GEOGRAPHICAL INFORMATION SYSTEMS PLAN .....</b>                  | <b>36</b> |
| 13.1 DATA RECORDING AND REPORTING .....                                  | 36        |
| <b>14.0 INTERIM HOLDING FACILITY SITING PLAN FOR RCWM PROJECTS .....</b> | <b>37</b> |
| <b>15.0 PHYSICAL SECURITY PLAN FOR RCWM PROJECTS SITES .....</b>         | <b>38</b> |
| <b>16.0 REFERENCES .....</b>   | <b>39</b> |

### LIST OF FIGURES

|          |                               |
|----------|-------------------------------|
| Figure 1 | Visitor Center Location Map   |
| Figure 2 | Visitor Center Site Map       |
| Figure 3 | Investigation Area Layout Map |
| Figure 4 | FUDS Project 7 Site Map       |
| Figure 5 | Approximate Grid Layout Map   |

### LIST OF TABLES

|             |  |    |
|-------------|--|----|
| Table 2-1:  | Separation Distances .....   | 8  |
| Table 2-2:  | Coordinates of Vertices of Sweep Area and Exclusion Area .....   | 15 |
| Table 4-1:  | Quality Control Methods and Pass/Fail Criteria for Visitor Center<br>Munitions and Explosives of Concern (MEC) Surface Sweep ..... | 22 |
| Table 10-1: | Quality Requirements for UXO Support at NASA WFF Visitor Center .....  | 32 |

## ACRONYMS AND ABBREVIATIONS

|        |   |
|--------|---|
| AAOC   | Administrative Agreement on Consent                                   |
| AOC    | Area of Concern   |
| AM     | Action Memorandum   |
| amsl   | above mean sea level  |
| APP    | Accident Prevention Plan  |
| ASR    | Archive Search Report   |
| ATF    | U.S. Bureau of Alcohol Tobacco and Firearms                           |
| ATFP   | U.S. Bureau of Alcohol Tobacco and Firearms Pamphlet                  |
|        |   |
| BEM    | Buried Explosion Module   |
|        |   |
| CERCLA | Comprehensive Environmental Response, Compensation, and Liability Act |
| CQCP   | Contractor Quality Control Plan                                       |
| CTO    | Contract Task Order   |
| CWM    | Chemical Warfare Material   |
|        |   |
| DDESB  | Department of Defense Explosives Safety Board                         |
| DID    | Data Item Description   |
| DMM    | discarded military munitions  |
| DoD    | Department of Defense   |
| DOT    | Department of Transportation  |
|        |   |
| EGIS   | Environmental Geographical Information System                         |
| EOD    | Explosive Ordnance Disposal   |
|        |   |
| FAR    | Federal Acquisition Regulations                                       |
| FOL    | Field Operations Leader   |
| ft     | feet  |
| FUDS   | Formerly Used Defense Site  |
|        |   |
| GIS    | Geographical Information System                                       |
| GPS    | Global Positioning System   |
|        |   |
| HSO    | Health and Safety Officer   |
| HTRW   | Hazardous, Toxic, or Radiological Waste                               |
|        |   |
| IDW    | investigation derived waste   |
| ISO    | industry standard object  |
| IVS    | instrument verification strip   |
|        |   |
| KGS    | KOMAN Government Solutions, LLC                                       |
|        |   |
| MaA    | Magotha fine sandy loam   |
| MD     | munitions debris  |
| MDAS   | Material Documented as Safe   |
| MEC    | Munitions and Explosives of Concern                                   |
| mm     | millimeter  |
| MM CX  | Munitions Mandatory Center of Expertise                               |
| MOA    | Memorandum of Agreement   |

|          |   |
|----------|---|
| MoD      | Molena loamy sand                                   |
| MPPEH    | Material Potentially Presenting an Explosive Hazard |
| MMRP     | Military Munitions Response Program                 |
| MRS      | Munitions Response Site                             |
| MSD      | minimum separation distance                         |
| NAD 83   | North American Datum 1983                           |
| NAOTS    | Naval Aviation Ordnance Test Station                |
| NASA     | National Aeronautics and Space Administration       |
| NAVSEA   | Naval Sea Systems Command                           |
| NCP      | National Contingency Plan                           |
| NPR      | NASA Procedural Requirements                        |
| NSS      | NASA Safety Standards                               |
| OE       | ordnance and explosives                             |
| OP       | Ordnance Pamphlet                                   |
| OSHA     | Occupational Safety and Health Administration       |
| OU9      | Operable Unit 9                                     |
| PM       | Project Manager                                     |
| POC      | Point of Contact                                    |
| QA       | Quality Assurance                                   |
| QC       | Quality Control                                     |
| RCWM     | Recovered Chemical Warfare Materiel                 |
| RI       | Remedial Investigation                              |
| RTK      | real-time kinematic                                 |
| SERES ES | SERES Engineering & Services                        |
| SHM      | Safety and Health Manager                           |
| SOW      | Statement of Work                                   |
| SSHP     | Site Safety and Health Plan                         |
| SUXOS    | Senior Unexploded Ordnance Supervisor               |
| TCRA     | Time-Critical Removal Action                        |
| TP       | Technical Paper                                     |
| TtNUS    | Tetra Tech NUS, Inc.                                |
| USDA     | United States Department of Agriculture             |
| USEPA    | United States Environmental Protection Agency       |
| UXO      | unexploded ordnance                                 |
| UXOQCS   | UXO Quality Control Specialist                      |
| UXOSO    | UXO Safety Officer                                  |
| USACE    | U.S. Army Corps of Engineers                        |
| VDEQ     | Virginia Department of Environmental Quality        |
| WFF      | Wallops Flight Facility                             |
| WP       | Work Plan   |



## 1.0 INTRODUCTION

This Work Plan (WP) describes the technical approach for performing Munitions and Explosives of Concern (MEC) Support Services for Operable Unit 9 (OU9), Formerly Used Defense Site (FUDS) Project 7, Boat Basin and Visitor Center site at the National Aeronautics and Space Administration (NASA) Goddard Space Flight Center's Wallops Flight Facility (WFF) Visitor Center, located in Wallops Island, Virginia. The activities include an MEC surface sweep to remove potential unexploded ordnance (UXO) and other metal scrap from the grass area located behind the Visitor Center. KOMAN Government Solutions, LLC (KGS) is performing this work for Bluestone Environmental under Contract No. 80GSFC21CA0008, Contract Task Order (CTO) 20. This WP was prepared in accordance with the United States Army Corps of Engineers (USACE) Engineer Regulation ER-385-1-95, Engineering Pamphlet EP-1110-1-18, and Data Item Description (DID) OE-005-01-01.

FUDS Project 7 is one of several projects identified under the FUDS Program at NASA WFF. In 2015, the Army and NASA entered into a Memorandum of Agreement (MOA) for the purpose of transferring Environmental Restoration, FUDS funds from the Army to NASA to conduct necessary response actions under Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), consistent with the Defense Environmental Restoration Program and the National Contingency Plan (NCP). Prior to the MOA, the USACE was responsible for the management and implementation of environmental remedial activities at FUDS.

In 2021, NASA entered into an Administrative Agreement on Consent (AAOC) with the United States Environmental Protection Agency (USEPA), which applies to past releases of hazardous substances, waste, and/or constituents at WFF and identified CERCLA response requirements, policies, and guidance as the primary process for planning and performing work necessary to complete remedial and corrective actions at FUDS located at WFF (USEPA Docket No. RCRA-03-2021-0022TH).

This WP addresses only the TCRA MEC surface sweep for OU9 and does not address the ongoing remedial investigation (RI) at OU9. NASA is conducting the TCRA under the AAOC executed between NASA and the USEPA.

### 1.1 PROJECT OBJECTIVES

The objective of this project is to conduct a MEC surface sweep for the Visitor Center portion of OU9, a FUDS Military Munitions Response Program (MMRP) site, managed by NASA. This work will address MEC items potentially becoming uncovered in the vicinity of the Visitor Center portion of OU9 from frost heave cycles of the winter months and/or erosion. No intrusive actions will be conducted during the surface sweep activities.

The purpose of the TCRA MEC surface sweep is to ensure the safety of visitors and WFF personnel at the Visitor Center and the surrounding area, and to remove potential MEC and Munitions Debris (MD) from the surface of the area of concern.

### 1.2 SITE CONDITIONS AND BACKGROUND

The NASA WFF is located in Accomack County, on the Eastern Shore of the Commonwealth of Virginia, approximately five miles south of the Maryland/Virginia boundary and just to the west of Chincoteague Island. The facility consists of three separate properties on which facilities have been constructed: Main Base, Mainland, and Wallops Island. The Visitor Center is associated with the Main Base and is located to the east of Route 175 (see **Figure 1**).

### 1.2.1 Site Layout

The Visitor Center consists of three buildings, a parking lot, walkways, outdoor displays, and an open lawn area. The complex is surrounded by a fence on three sides and a wetland on the fourth side. Vehicle access is controlled through gates. The area to be cleared of MEC consists of a four-acre lawn area located generally east and southeast of the Visitor Center building complex. The area is bordered by the Visitor Center buildings and concrete paving to the west, wooded land and a fence line to the south, wooded land to the north, and a wetland to the east (see **Figures 2 and 3**).

Ownership of the property was transferred from the Navy to NASA in 1959 and the former Test Cell area has been converted to a Visitor Center (see **Figure 1** for site location). The center consists of several buildings used for displays, educational classes, and offices, as well as outdoor displays including rockets, a parking lot, picnic tables, and an open mowed lawn (see **Figure 2**).

The Visitor Center is located within OU 9, FUDS Project 7, which consists of four Munitions Response Sites (MRS) within the MMRP on the eastern portion of the Main Base. The MMRP includes the Pyrotechnic Dump (MRS 1), Gun Butt Number 1 (MRS 2), Gun Butt Number 2 (MRS 3), and the south bank of the Boat Basin (MRS 4). The Area of Concern (AOC) for this proposed TCRA MEC surface sweep will include the location of the former gun butts (MRS 2 and MRS 3) and the surrounding area (see **Figure 4**).

### 1.2.2 Historical Site Use

Archival information indicates that the Visitor Center area was used as a test range for munitions testing by the Navy and related Department of Defense (DoD) agencies from 1948 through 1959. The AOC was used during that time to ground test aircraft guns and ammunition and included two firing points and two firing-in butts. The test range was also used as a Test Cell during this period to test newly produced munitions and machine guns.

The current Visitor Center area was first developed by the Naval Aviation Ordnance Test Station (NAOTS) in 1948. The initial development included the construction and operation of a Test Cell and firing position and firing-in butt for the ground testing of aircraft machine guns and newly developed ammunition (USACE, 2005).

The NAOTS operation was expanded in 1952 and later further expanded in 1955 to include two firing points and two firing-in butts. The Test Cell complex included a production test range, an experimental range, a separate firing-in butt for each range, and a ready service magazine. Documents indicate that the range complex was in use at least through 1957, and it is conjectured that the range continued operations up to 1959 when the facility was closed.

Available information indicates that the primary use of the range was the testing of 20-millimeter (mm) and 30mm aircraft machine guns and ammunition. The Test Cell was used for the ground firing test and evaluation of experimental aircraft guns and mechanisms and for proof testing of production lot of 20mm and 30mm ammunition. NASA and USACE conducted historical archive research and determined that by design and plan, explosive ammunition was not fired at the Test Cell/Gun Laboratory Range Area (USACE, 2005).

### 1.2.3 Site Characteristics

As shown on **Figures 2 and 3**, an approximate four-acre portion of the open lawn, starting about 200 feet (ft) from the building complex and extending to the east to a wetland, is the former location of the firing lanes and firing-in butts (MRS 2 and MRS 3). The vegetation within the investigation area at the site is primarily grasses with a few trees.

The majority of the WFF Main Base, including the OU9 area, is located on a high terrace landform (25 to 40 ft above Mean Sea Level [amsl]) with the northern and eastern portions located on low terrace (0 to 25 ft amsl) and tidal marsh.

The soil classifications for the area of the WFF Visitor Center are primarily Molena loamy sand (MoD) and Magotha fine sandy loam (MaA), based on the 1988 Accomack County Soil Conservation Service soil classification map (NASA, 2017). The Coastal Plain soils of the Eastern Shore are generally very level soils and many soil types (not Molena or Magotha) are classified as prime farmland by the United States Department of Agriculture (USDA). The dominant soils in the area of the WFF are high in sand content, resulting in a highly leached condition, an acidic pH, and a low natural fertility.

The four major aquifers identified on the Eastern Shore of Virginia are the Columbia aquifer and the three aquifers comprising the Yorktown-Eastover multi-aquifer system.

The Columbia aquifer is known as the water table aquifer, and primarily consists of Pleistocene sediments of the Columbia Group. It is unconfined and typically overlain by wind-deposited beach sands, silts, and gravel. The aquifer occurs between the depths of 5 and 60 ft below the ground surface, with the water table ranging between the depths of 0 and 30 ft below the ground surface. Groundwater generally flows east and north toward local tributaries and streams at the WFF, and also toward a marsh area that separates Chincoteague Island from the Eastern Shore mainland to the northeast of the WFF.

The Yorktown-Eastover system is a multi-aquifer unit consisting of late Miocene and Pliocene deposits and is composed of the sandy layers of the Yorktown and Eastover Formations. The top of the shallowest confined Yorktown-Eastover aquifer in the area of WFF is found at depths of approximately 100 ft below the ground surface. It is separated from the overlying Columbia aquifer by a 20 to 30 ft confining layer (aquiclude) of clay and silt. The Yorktown-Eastover aquifers are classified as the upper, the middle, and the lower Yorktown-Eastover aquifers. Correspondingly, each Yorktown-Eastover aquifer is overlain by the upper, middle, and lower Yorktown-Eastover aquicludes (NASA, 2017).

### **1.3 REGULATORY HISTORY TO DATE**

#### **1.3.1 Previous Actions**

The area of the Visitor Center (MRS 2 and MRS 3) and Boat Basin (MRS 4) was inspected during the performance of a Site Assessment in 1991 and it was reported that “a large number of spent 20mm practice rounds” were found scattered in the area of one of the former firing-in butts, in addition to two spent 75mm practice rounds (Metcalf & Eddy, 1991).

During a subsequent visual property inspection conducted in April 2005 as part of the Archive Search Report (ASR), six spent 20mm rounds were found in the vicinity east of the display rockets, approximately 400 ft southeast of the Visitor Center (USACE, 2005). In response to this finding in 2005, NASA erected a temporary fence to isolate and control access to the area east of the outdoor displays. The area between the temporary fence and the buildings was later walked during a site visit by Tetra Tech NUS, Inc. (TtNUS) and NASA, and several more 20mm projectiles were observed near the buildings. Because of this observation, NASA erected another temporary fence to restrict access to the lawn area east and southeast of the Visitor Center. Based on the findings in the ASR and the site walks, it was determined the area potentially presented a safety hazard that may constitute an imminent and substantial endangerment to WFF personnel and others using the Visitor Center complex. To mitigate the potential risks, NASA completed a 2006 UXO sweep and clearance of the area to a depth of 12 inches.

During the 2006 Visitor Center UXO Surface Sweep/Intrusive operations, 243 surface anomalies/targets were identified. Based on a review of the grid reporting sheets, the following items were found within the site clearance grids:

- 162 munitions items (20mm/30mm fragments and projectiles).
- 2 munitions-related scrap debris items (empty propellant charge canisters).
- 21 identified scrap metal items (e.g., pipe, rebar, wire, nails, etc.).
- 58 unidentified scrap metal items (generally small or rusted metal fragments).

A total of 2,150 target items were identified and excavated during the 2006 intrusive activities at the site. No live or fuzed Material Potentially Presenting an Explosive Hazard (MPPEH) items were found during the intrusive investigation. The following provides a summary of the items removed from the site:

- 1,106 munitions items (20mm/30mm fragments, projectiles, and empty cartridges).
- 7 munitions-related debris items (grenade handle, mortar fins, M-1 clips, and 75mm projectiles).
- 302 identified scrap metal items (pipe, rebar, nails, bolts, strapping, etc.).
- 332 unidentified scrap metal items (generally small or rusted metal fragments).

The following 341 items were left in-place during the 2006 subsurface investigation:

- 3 anomalies associated with an area identified as a probable former burn pit containing slag-like melted and consolidated metal debris including 20mm/30mm fragments. This area is covered by 12 inches or more of soil.
- 10 identified scrap metal items too large to move (large metal plates, concrete and rebar).
- 328 unidentified items at depths greater than 1 foot.

Three targets that were identified through the geophysical survey were not able to be located because no contact was made using the metal detectors or through hand excavations.

During the 2006 investigation, 62 anomalies identified during the geophysical survey were not investigated because they coincided with known man-made cultural features (sidewalks, utility lines, etc.).

Based on the 2006 review of the activities conducted during the initial Visitor Center site clearance, the upper one-foot of ground within the site area investigated was considered clear of MPPEH. This conclusion is further based on the fact that no live/fuzed/explosive containing items were identified anywhere on-site during the investigation.

Following the 2006 Visitor Center UXO Surface Sweep/Intrusive operations, the portion of the Visitor Center site covered under this investigation was recommended to be reopened for the current non-intrusive site uses. Based on the success of the clearance operations, periodic/regular surface sweeps were deemed not needed for current site use as long as no significant ground surface disruption occurred. It was recommended that a dig restriction be put in place for the site study area, including the approximate four-acre open field cleared during site activities as well as those areas immediately adjacent to the perimeter of the study area. The dig restriction was entered into the NASA WFF Facility Management Plan and Tools and no digging, disturbance of soils, or other intrusive activities are permitted without an approved plan. Approved plans must include the participation of qualified UXO Technicians or Specialists and must include

UXO avoidance or clearance activities. These restrictions were recommended to remain in place until further response activities were completed at the Visitor Center. Further response actions, if deemed necessary, were the responsibility of the USACE.

Due to frost heave cycles and erosion, several MD were identified on the Visitor Center grounds in 2013. In June 2013, NASA completed a detector-aided MEC surface clearance within the Visitor Center area. Results of the surface survey included the following:

- No MEC or MPPEH was recovered on the surface during this investigation at the Visitor Center.
- A total of 60 items were recovered from the Visitor Center during the June 2013 surface clearance. All 60 items were identified as fragments from 20mm projectiles and were certified as Material Documented as Safe (MDAS).
- The highest concentration of recovered MDAS items were located in or near a depression located on the eastern portion of the Visitor Center site. It appears as though drainage/surface run-off flows in this area which contributes to erosion.
- High concentrations of additional anomalies were detected below the surface throughout the entire Visitor Center site (USACE, 2016).

All MDAS items were dual inspected and secured in a sealed drum. All secured MDAS items were certified as free and clear of any explosive hazard. The sealed MDAS drum was turned over to NASA base personnel for final disposition.

As part of RI activities in 2014, USACE conducted an intrusive investigation at each FUDS Project 7 OU9 MRS to determine the nature and extent of MEC and MD. The intrusive investigations at MRS 2 and MRS 3 (former gun butt locations near the Visitor Center) resulted in the identification of 293 MD objects, in addition to one potential 20mm discarded military munitions (DMM) item. A few of the items removed could not be completely cleared of dirt and were destroyed along with the potential DMM to adhere to regulations regarding the inspection of MPPEH.

Although the ASR found no documentation indicating high explosive ammunition or fuzes were used at the former Test Cell, USACE determined one potential MEC round was found.

### **1.3.2 Current Actions**

USACE drafted a RI report in 2019, prior to transferring site management activities to NASA. Currently, NASA is completing human health and ecological risk assessments to determine potential risks presented by MEC and munitions constituents in the FUDS Project 7 OU9 surface soil, subsurface soil, sediment, surface water, and groundwater. Following the completion of the RI, NASA will issue a Feasibility Study and a Proposed Plan to address human health and ecological risks and outline a path forward.

### **1.3.3 Site-Specific Dynamic Events**

The major site-specific dynamic event that could occur is the discovery of a live ordnance item. The Senior Unexploded Ordnance Supervisor (SUXOS) will direct this portion of the field activities. The team will attempt to identify the type and/or condition of the ordnance and its location and will report the findings to the NASA point of contact (POC).

### **1.3.4 Potential Worker Hazards**

Potential safety hazards are detailed in the Accident Prevention Plan (APP) and Site Safety and Health Plan (SSHP), submitted under separate cover. UXO-trained personnel will be present on-site throughout the operation to implement the requirements of the APP. A SUXOS and

Unexploded Ordnance Safety Officer (UXOSO) will be responsible for ensuring worker safety and will also be responsible for documenting and reporting any health and/or safety infractions to the KGS Safety and Health Manager (SHM). The SUXOS, with assistance from the UXOSO, will also perform any necessary notifications to the Project Manager (PM).

Based on the potential hazards identified at the site, all field employees will be required to have 40-hour Hazardous Waste Operations training and a current Occupational Safety and Health Administration (OSHA) 8-hour refresher course in addition to applicable UXO-specific training.

#### **1.4 WORK PLAN ORGANIZATION**

This WP was prepared following the format, content, and preparation instructions specified in the USACE DID OE-005-01-01 for a Type II Work Plan [U.S. Army Engineering and Support Center, Huntsville, Alabama (USACE, 2009)]. Sections referenced in the DID that are not applicable to this Statement of Work (SOW) have been omitted from the WP, but left in the table of contents and noted below as “not used”.

The text of the WP for reference and formatting purposes as per DID. Sections are organized as follows:

- Section 1 Introduction
- Section 2 Technical Management Plan
- Section 3 Explosive Management Plan
- Section 4 Explosives Siting Plan
- Section 5 Geophysical Prove-Out Plan and Report
- Section 6 Geophysical Investigation Plan
- Section 7 Location Surveys and Mapping Plan
- Section 8 Work, Data, and Cost Management Plan
- Section 9 Property Management Plan (not used)
- Section 10 Contractor Quality Control Plan
- Section 11 Environmental Protection Plan (not used)
- Section 12 Investigative Derived Waste Plan (not used)
- Section 13 Geographical Information Systems Plan
- Section 14 Interim Holding Facility Siting Plan for RCWM Projects (not used)
- Section 15 Physical Security Plan for RCWM Projects Site (not used)
- Section 16 References

## 2.0 TECHNICAL MANAGEMENT PLAN

The Technical Management Plan was prepared to document the approach and procedures to be used to execute the tasks required under this Task Order.

### 2.1 APPLICABLE GUIDANCE AND REGULATIONS

All UXO sweep and clearance activities will be performed in accordance with all local, state, and federal regulations and will include all applicable DID requirements including EM 385-1-97, (USACE, 2013; this document superseded Engineer Pamphlet EP-75-1-2) and DID OE-005-01.01 (USACE, 2009).

All activities involving work in areas potentially containing MEC hazards shall be conducted in full compliance with the NASA and DoD requirements regarding personnel, equipment, and procedures.

### 2.2 TECHNICAL SCOPE

The area has historically been used as a test range for munitions testing by the Navy consequently, complete munitions, and partial items, which might contain boosters, bursters or components, may be encountered. If a complete UXO item or ordnance related material is encountered, the SUXOS, UXOSO, UXO Quality Control Specialist (UXOQCS), and UXO Technicians will attempt to identify the type and/or condition of the ordnance and its location and will report its finding to the NASA POC.

If UXO cannot be identified by type as a conventional munitions and/or if the MEC is suspected to be potentially Chemical Warfare Material (CWM), personnel will withdraw upwind from the area, secure the site, and request assistance from the NASA POC. If directed, UXO personnel will take emergency non-invasive actions such as covering the item with plastic sheeting and securing the area until the appropriate exclusion and safety zones have been determined. Potential exposure to CWM on this site is not anticipated.

#### 2.2.1 Performance Standards

An instrument verification strip (IVS) will be constructed before the surface sweep activity commences. The IVS will be constructed with two small industry standard objects (ISOs): 1-in (2.54 cm) by 4-in (10.16 cm) steel pipes (part number 44615K466 from the McMaster-Carr online catalog <http://www.mcmaster.com/> or equivalent): Shape: Straight nipple, threaded both ends; Schedule: 40; Pipe Size: 1 in (1.315-in outer diameter); Length: 4 in; Finish: Black welded steel.

The two ISOs will be buried vertically (perpendicular to the ground surface) at depths of approximately 8 cm and 15 cm to the ISO center of mass. The ISOs will be buried at depths which provide a good signal-to-noise ratio, are within the instrument's detection range, and are at least 1 meter away from any competing anomaly source.

A Quality Assessment spreadsheet will be used to establish and validate quality metrics of the project.

#### 2.2.2 UXO Surface Sweep

The UXO Team will establish a site grid/coordinate system for the specified surface sweep zone at the site and conduct a MEC surface sweep of the AOC. Each grid within the surface sweep area will be walked and inspected by two UXO-qualified personnel using hand-held magnetometers, including areas of surface erosion or obstructions such as fallen trees. The intent of the instrument-aided visual survey and clearance is to identify and remove any MEC/MPPEH

that has been exposed at the surface from frost heave cycles of the winter months and/or erosion. No intrusive actions will be conducted during the surface sweep activities.

If a UXO item is encountered, its location will be recorded and/or marked using the grid coordinate system established at the site, and the UXO Team will determine its condition prior to proceeding with the sweep. All fuzed UXO items will be disposed of in-place unless it can be determined that no explosive hazard remains. Unfuzed UXO items which may contain explosive residue may be consolidated for later disposal. MD and other metal scrap will be removed from the AOC and secured for later disposition.

During intentional detonations of MEC, engineering controls may be implemented to reduce minimum separation distances (MSD). Separation distances are presented in **Table 2-1**. Engineering controls may include sandbag mitigation or tamping. Sandbag mitigation may be implemented as the engineering control in accordance with the Department of Defense Explosives Safety Board (DDESB) memorandum, Clarifications Regarding Use of Sandbags for Mitigation of Fragmentation and Blast Effects Due to Intentional Detonation of Munitions (DDESB, 2020); copies of this document will be available onsite. Tamping (single or multiple items) may be used in accordance with Technical Paper (TP) 16, Revision 5 and the Buried Explosion Module (BEM) version 7.2 (DDESB, 2020). These reports will be available onsite for all mitigation methods used.

| <b>Table 2-1: Separation Distances</b>  |   |   |   |
|---|---|---|---|
| <b>Visitor Center Munitions and Explosives of Concern (MEC) Surface Sweep</b> |   |   |   |
| NASA Wallops Flight Facility, Wallops Island, Virginia                        |   |   |   |
| <b>Munition Type</b>  | <b>Hazardous Fragment Distance (ft)</b> | <b>Single Sandbag Mitigation MSD (ft)</b> | <b>Double Sandbag Mitigation MSD (ft)</b> |
| 20 mm High Explosive  | 73                                      | 25  | 12.5                                      |
| 30 mm High Explosive  | 120                                     | 25  | 12.5                                      |

### 2.3 CHANGED SITE CONDITIONS

KGS will keep NASA updated via daily reporting and communications of on-site conditions. In the event extreme adverse weather conditions exist or a change in site conditions is identified, KGS will notify the NASA POC immediately.

The potential for changed site conditions (besides weather) is highly unlikely since the areas is suspected to contain UXO and/or MD. The greatest obstacles are likely to be an area which includes non-MD (scrap) such as nails and other ferrous scrap (e.g., cultural debris).

### 2.4 UXO SURVEY INSTRUMENTATION

A Schonstedt® magnetometer (such as the model GA-52Cx or similar model) will be used for UXO sweep operations. This instrument is a metal locator that only detect ferrous or magnetic material, and will be used to assist in clearing the ground surface of metal debris and UXO and to ensure the area of operations is 100% free of any other ferrous material. The detection depth is limited by the size and orientation of a target and soil characteristics of the work area.

These magnetometers do not require calibration. They have a GO/NO-GO field operational check. This check is achieved by using a target of similar size and characteristic as the expected type of UXO. Failure to detect the test target is reason to reject an instrument. Magnetometers will be checked daily using surrogates at varying depths and orientation before starting the UXO activities



or after battery changes. The UXO Technician will conduct random checks during daily operations.

## 2.5 PROJECT ORGANIZATION

Mr. Stephen Deeter is the PM and will provide overall management of this Task Order. He will be responsible for KGS' performance from project inception to completion. All site work activities will be coordinated through the following:

| Representative   | Phone Number               |
|--|----------------------------|
| Stephen Deeter, P.G. (KGS): PM   | (484) 388-0750<br>(mobile) |
| Gregory T. Birch, PMP (KGS): Client Services Manager   | (302) 373-5724<br>(mobile) |
| Ericka Seiler (KGS): Field Operations Leader (FOL)   | (610) 357-1346             |
| John Rawlings, CSP, LSP, CHST, STS-C (KGS): SHM  | (301) 661-5629 (office)    |
| Mark Carr (SERES Engineering & Services [SERES ES]): SUXOS, Site Superintendent, Project Health and Safety Officer (HSO) | (803) 460-6015             |
| <i>To be determined</i> (SERES ES): UXOQCS, UXOSO  | <i>To be determined</i>    |
| WFF Environmental Office Points of Contact:  |                            |
| Marianne Simko (Bluestone): Primary POC  | (757) 710-5904             |
| Susan Dunn (Bluestone)   | (757) 824-1832             |
| David Liu (NASA)   | (757) 824-2141             |
| TJ Meyer (NASA)  | (757) 824-1987             |
| WFF Protective Services:   |                            |
| Adam Dingus  | (757) 854-7557             |
| WFF Safety Office:   |                            |
| Jason Rabon  | (757) 824-7569             |
| Marvin Bunting   | (757) 824-2030             |

The following subsections contain details pertaining to project schedule, submittal requirements, and personnel. A project organization chart for KGS employees is shown below, and a detailed description of personnel responsibilities is provided in Section 2.6.

### 2.5.1 Project Schedule

Following approval of the WP, it is anticipated that KGS personnel will mobilize to the site on or about 11 July 2022 for site preparation and UXO support activities. Establishing the site grid system and conducting the UXO surface sweep should evolve around a schedule of approximately four workdays. This schedule is based on 8-hour days including daily briefings and traveling to and from the site. A work week will be comprised of five eight-hour workdays. Overtime work (i.e., greater than 40-hours per week) may be required and workdays and/or the work week

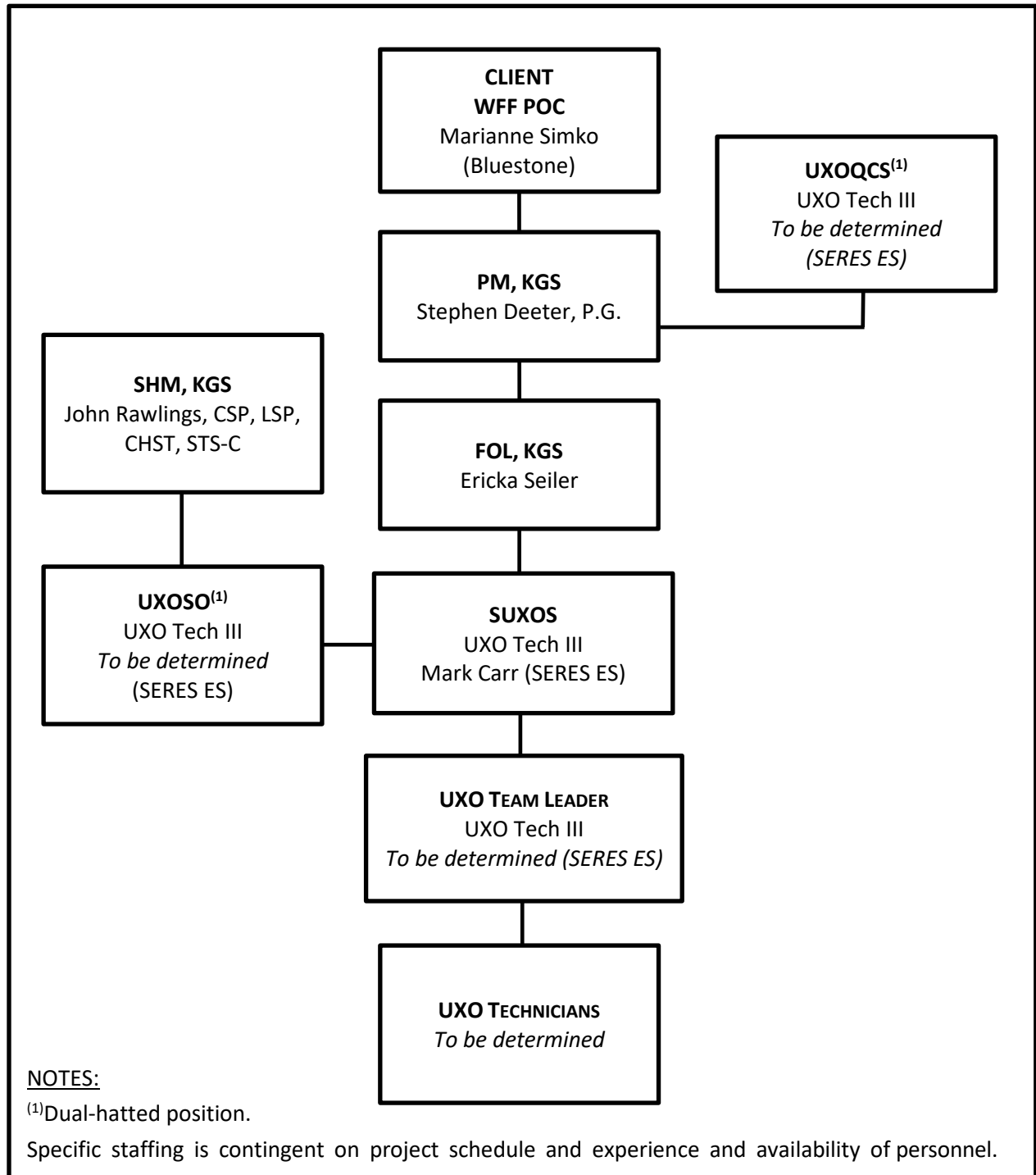
may be extended if it is determined to be beneficial to the project and achieving NASA's objective. The project schedule will be adjusted as necessary throughout the project, as the duration is only an estimate due to the unknown quantity of anomalies that may be encountered.

## 2.5.2 Submittals

No firm schedule of deliverables has been established for this project. NASA is currently conducting internal coordination of activities and reviewing facility and management priorities, which will determine the schedule for this project. However, NASA management has targeted 26 July 2022 as the completion date for all field activities. Based on this target, and to allow for contingencies, KGS has developed a schedule that projects a July start date for field activities. The major milestones and deliverables associated with this project are listed below.

| <b>Required Submittals and Estimated Due Dates</b>                  |  |                            |
|---|--|----------------------------|
| <b>Milestone</b>  | <b>Deliverable</b>   | <b>Due Date</b>            |
| Action Memo (AM) and WP   | Draft to USEPA / Virginia Department of Environmental Quality (VDEQ) | 05/23/2022                 |
|   | Comments from USEPA/VDEQ   | 06/06/2022                 |
|   | Final to USEPA/VDEQ  | 06/16/2022                 |
| Public Notice and Fact Sheet  | Draft to NASA  | 06/08/2022                 |
|   | Comments from NASA   | 06/10/2022                 |
|   | Final to NASA  | 06/15/2022                 |
|   | Publishes Public Notice  | Week of 07/05/2022         |
| Accident Prevention Plan and Site Safety and Health Plan (APP-SSHP) | Draft to NASA  | 06/09/2022                 |
|   | Draft to MOSI S&E checklist  | 06/13/2022                 |
|   | Comments from NASA   | 06/15/2022                 |
|   | Final to NASA  | 06/20/2022                 |
| Field Work (estimated)  | Daily email reports  | Week of 07/11/2022         |
| Field Activity Report   | Draft to USEPA/VDEQ  | 09/14/2022                 |
|   | Comments from USEPA/VDEQ to NASA (KGS)                               | 10/14/2022<br>(10/17/2022) |
|   | Final to USEPA/VDEQ  | 11/02/2022                 |

### PROJECT ORGANIZATION CHART



## **2.6 PERSONNEL**

Personnel involved with the on-site UXO support will include the following employees of KGS' subcontractor, SERES ES: SUXOS, UXOSO/UXOQCS, UXO Team Leader, and UXO Technicians. The UXO Site personnel will provide full-time field support. The PM will provide support off-site throughout the project duration. The project organization is illustrated in the Project Organization Chart.

All personnel will be required to comply with the medical, training, experience, and educational requirements specified in USACE DID OE-025.01, Chapter 29 Code of Federal Regulations 1910.120, and the APP.

### **2.6.1 Project Manager**

The PM shall have a minimum of five years of project management experience. The PM will have overall responsibility for the management and completion of the project, which includes at a minimum: resource allocation; financial reporting; schedule control; review and approval of deliverables; invoice review and approval; and overall management of the project. The PM will ensure all UXO issues are addressed and resolved to include equipment, staffing and administrative requirements.

### **2.6.2 Field Operations Leader**

The FOL will act as a liaison for the PM and ensure all subcontractor responsibilities are being met. Although direct communication between the on-site personnel and the NASA POC is necessary, the FOL will keep the PM informed of all directives from the NASA POC. The FOL has immediate stop work authority.

### **2.6.3 Senior UXO Supervisor**

The SUXOS will direct daily implementation and enforcement of the Task Order requirements as they apply to UXO support and safety during site activities. The SUXOS will have the overall responsibility for the day-to-day UXO operations at the site, and will direct subcontractors, FOL and other personnel resources at the site on UXO support issues to ensure their safety. The SUXOS will be responsible for all site MEC documentation.

Other responsibilities of the SUXOS include:

- Assist in the review of site-specific WPs and initiate Field Change Requests as needed.
- Ensure site activities are scheduled and executed with adequate personnel and equipment resources to perform the job safely with required quality and in a timely manner.
- Ensure that adequate communication between field personnel and emergency response personnel are available.
- Ensure site personnel are trained in accordance with the SSHP.
- Ensure all notifications are given prior to beginning work.
- Ensure required exclusion zones are established and maintained.

- Ensure any intrusive operations (restricted to IVS installation and driving of stakes to delineate corners of sweep grids) are conducted in accordance with the WP and state and federal regulations.
- Implement the approved UXO safety program in compliance with all federal, state, and local regulations.
- Analyze UXO and explosives operational risks, hazards, and safety requirements.
- Enforce personnel limits and safety exclusion zones for UXO operations.
- Conduct safety inspections to ensure compliance with UXO Safety Standards/Regulations.
- Implement Quality Control (QC) requirements including QC inspections of all UXO related work.
- Direct and approve corrective actions to ensure that UXO related work complies with contractual requirements.

The SUXOS will have a minimum of 10 years of Explosive Ordnance Disposal (EOD)/UXO experience including UXO clearance operations and supervision of personnel. The SUXOS will have the authority to stop site activities if an immediate dangerous/hazardous situation exists. The dangerous situation will be immediately reviewed with the UXOSO, and the FOL and reported to the PM and NASA POC.

#### **2.6.4 UXO Safety Officer/UXO Quality Control Specialist**

The UXOSO/UXOQCS shall be on-site at all times during UXO related work and has immediate stop work authority.

Other responsibilities of the UXOSO/UXOQCS include:

- Ensure site personnel are trained in accordance with the SSHP.
- Ensure that adequate communication between field personnel and emergency response personnel are available.
- Ensure required exclusion zones are established and maintained.
- Ensure any intrusive operations (restricted to IVS installation and driving of stakes to delineate corners of sweep grids) are conducted in accordance with the WP.
- Implement the approved UXO safety program in compliance with all federal, state, and local regulations.
- Analyze UXO and explosives operational risks, hazards, and safety requirements.
- Enforce personnel limits and safety exclusion zones for UXO operations.
- Conduct safety inspections to ensure compliance with MEC Safety Standards and Regulations.
- Conduct QC inspections to ensure compliance with the WP.

The UXOSO/UXOQCS will have a minimum of 8 years of EOD/UXO experience in all phases of munitions response actions or range clearance activities, as appropriate for the contracted operations, and applicable safety standards.

### **2.6.5 UXO Team Leader (UXO Tech III)**

The UXO Team Leader (UXO Tech III) will have a minimum of 8 years of EOD/UXO experience including prior military EOD and/or commercial UXO experience in munitions response actions and/or range clearance activities. The UXO Team Leader may supervise up to 6 UXO Technicians. The UXO Team Leader will conduct UXO activities as directed by the SUXOS. The UXO Team Leader will meet the qualifications as stated in DDESB TP 18 dated 20 Dec 2004 and be under the direct supervision of the SUXOS.

### **2.6.6 UXO Technicians (UXO Tech II or I)**

The UXO Technician II will have prior military EOD experience or a minimum of three (3) years of experience in munitions response actions or range clearance activities.

The UXO Technicians will conduct UXO activities as directed by the UXO Team Leader and the SUXOS.

The UXO Technicians will conduct the anomaly investigation effort to clear all non UXO items, to identify all UXO and MD items. The UXO Technicians will meet the qualifications of a UXO Technician as stated in DDESB TP 18 dated 20 Dec 2004 and be under the direct supervision of the UXO Team Leader.

## **2.7 MOBILIZATION AND SITE PREPARATION**

### **2.7.1 Site Accessibility and Traffic Control**

The site is a controlled area, accessible only through an access gate. Safety requires an active exclusion zone of a minimum of 200 feet around the area to be screened [based on the fragmentation distance for the known and/or suspected munitions in accordance with DDESB TP 16] be established and maintained before any on-site activities occur due to the potential of encountering live explosively configured/fuzed munitions. If non-site personnel or non-essential non-UXO personnel enter the exclusion zone, all operations will cease inside the investigation (sweep) area until the exclusion zone is reestablished.

Both routine and emergency response actions dictate the need for prevention of unauthorized site access, and for the protection of vital records and equipment. All equipment will be secured and brought to a designated location each day.

### **2.7.2 Site Security**

Site Security will be maintained to ensure that non-essential personnel do not access the exclusion zone during the UXO surface sweep and UXO disposal operations.

### **2.7.3 Unexploded Ordnance Escort**

UXO escort activities will be limited to a possible brief escort by the SUXOS of an approved visitor into the investigation area. All UXO escort support will be performed in accordance with all local, state, and federal regulations and will include all applicable SOW and DID requirements including EM 385-1-97, (USACE, 2013; this document superseded Engineer Pamphlet EP-75-1-2) and DID OE-005-01-01. All activities involving work in areas potentially containing UXO hazards shall be conducted in full compliance with Munitions Mandatory Center of Expertise (MM CX) requirements regarding personnel, equipment, and procedures:

1. If a complete munition or ordnance related material is encountered, the material will be avoided during this phase of the project. The UXO Technician will not attempt to

- identify the type or condition of the ordnance. Its location will be reported to the SUXOS and FOL. UXO avoidance will be practiced at all times. Potential exposure to CWM on this site is not anticipated. In the event that Hazardous, Toxic, or Radiological Waste (HTRW) is encountered on-site, the work site will be evacuated until the SUXOS, with concurrence of the NASA POC, identifies and implements appropriate protective measures.
2. The UXO Escort will conduct a UXO avoidance survey for any proposed survey stake location using a metal detector to check for possible ordnance or ordnance related material. If an anomaly is encountered or if the UXO Technician suspects the presence of UXO, the proposed stake location will be relocated to an area free of concerns/anomalies. The UXO Escort will clearly mark any area with visible ordnance or MEC and the area will be avoided. The visible ordnance or MEC will be noted in the field logs and the coordinates will be recorded. The UXO Escort will report the UXO/MEC to the SUXOS, and PM (or his designee).
  3. No ordnance, munitions, explosives, or ordnance related materials will be moved, removed, detonated, or disposed of during UXO Escort duties.

#### 2.7.4 Boundaries

Before the site sweep work begins, the SUXOS will use a real-time kinematic (RTK) global positioning system (GPS) instrument (discussed in detail in Section 5.9) to mark out the previously-identified boundaries of the MEC surface sweep and the 200-foot exclusion area around the investigation area (shown on **Figures 2 and 3**). The coordinates of the vertices of the zones are provided in **Table 2-2**, and will be provided to the field team in electronic format.

| <b>Table 2-2: Coordinates of Vertices of Sweep Area and Exclusion Area<br/>Visitor Center Munitions and Explosives of Concern (MEC) Surface Sweep<br/>NASA Wallops Flight Facility, Wallops Island, Virginia</b> |                     |   |                  |
|--|---------------------|---|------------------|
| Point ID   | Site Zone           | NAD83 State Plane Coordinates<br>Virginia South FIPS 4502 (US ft) |                  |
|  |                     | EASTING (X)   | NORTHING (Y)     |
| 02   | Sweep area boundary | 12,360,384.615647   | 3,879,320.014049 |
| 03   | Sweep area boundary | 12,360,479.854302   | 3,879,344.361769 |
| 04   | Sweep area boundary | 12,360,579.696294   | 3,879,371.156335 |
| 05   | Sweep area boundary | 12,360,508.133116   | 3,879,286.051190 |
| 06   | Sweep area boundary | 12,360,509.429046   | 3,879,281.437354 |
| 07   | Sweep area boundary | 12,360,515.658364   | 3,879,280.296608 |
| 10   | Sweep area boundary | 12,360,220.922077   | 3,879,172.812899 |
| 11   | Sweep area boundary | 12,360,319.729294   | 3,879,198.448675 |
| 12   | Sweep area boundary | 12,360,415.296032   | 3,879,223.012274 |
| 13   | Inner grid node     | 12,360,512.368344   | 3,879,248.573575 |
| 14   | Sweep area boundary | 12,360,553.488669   | 3,879,258.045997 |
| 20   | Sweep area boundary | 12,360,255.157573   | 3,879,077.580150 |
| 21   | Inner grid node     | 12,360,351.543207   | 3,879,101.468882 |
| 22   | Inner grid node     | 12,360,448.217554   | 3,879,125.514110 |
| 23   | Inner grid node     | 12,360,546.090062   | 3,879,149.433353 |
| 24   | Sweep area boundary | 12,360,641.313624   | 3,879,173.219395 |

**Table 2-2: Coordinates of Vertices of Sweep Area and Exclusion Area  
Visitor Center Munitions and Explosives of Concern (MEC) Surface Sweep  
NASA Wallops Flight Facility, Wallops Island, Virginia**

| Point ID | Site Zone               | NAD83 State Plane Coordinates<br>Virginia South FIPS 4502 (US ft) |                  |
|----------|-------------------------|---|------------------|
|          |                         | EASTING (X)   | NORTHING (Y)     |
| 25       | Sweep area boundary     | 12,360,723.187804   | 3,879,139.773267 |
| 30       | Sweep area boundary     | 12,360,296.079079   | 3,878,984.670559 |
| 31       | Inner grid node         | 12,360,383.163878   | 3,879,005.042566 |
| 32       | Inner grid node         | 12,360,480.759155   | 3,879,028.155708 |
| 33       | Inner grid node         | 12,360,579.138552   | 3,879,051.182237 |
| 34       | Inner grid node         | 12,360,673.491382   | 3,879,072.833769 |
| 35       | Sweep area boundary     | 12,360,737.985347   | 3,879,088.421336 |
| 40       | Sweep area boundary     | 12,360,319.445502   | 3,878,931.618500 |
| 41       | Sweep area boundary     | 12,360,407.255365   | 3,878,931.640153 |
| 42       | Sweep area boundary     | 12,360,446.927530   | 3,878,930.278280 |
| 43       | Sweep area boundary     | 12,360,495.632813   | 3,878,983.178108 |
| 44       | Sweep area boundary     | 12,360,509.339151   | 3,879,009.988094 |
| 45       | Sweep area boundary     | 12,360,585.080797   | 3,879,030.930309 |
| 46       | Sweep area boundary     | 12,360,643.905811   | 3,879,009.592753 |
| 47       | Sweep area boundary     | 12,360,688.944107   | 3,879,023.765297 |
| 50       | Exclusion area boundary | 12,360,047.091060   | 3,879,290.297573 |
| 51       | Exclusion area boundary | 12,360,213.800044   | 3,879,333.517631 |
| 52       | Exclusion area boundary | 12,360,182.610802   | 3,879,430.319930 |
| 53       | Exclusion area boundary | 12,360,654.402509   | 3,879,551.233731 |
| 54       | Exclusion area boundary | 12,360,798.531486   | 3,879,391.310494 |
| 55       | Exclusion area boundary | 12,360,729.484052   | 3,879,307.211909 |
| 56       | Exclusion area boundary | 12,360,853.904735   | 3,879,256.385895 |
| 57       | Exclusion area boundary | 12,360,911.550289   | 3,879,056.339379 |
| 58       | Exclusion area boundary | 12,360,785.378625   | 3,878,889.992599 |
| 59       | Exclusion area boundary | 12,360,640.638429   | 3,878,841.984493 |
| 60       | Exclusion area boundary | 12,360,595.659844   | 3,878,859.124879 |
| 61       | Exclusion area boundary | 12,360,514.152789   | 3,878,770.598481 |
| 62       | Exclusion area boundary | 12,360,216.251482   | 3,878,774.315337 |
| 63       | Exclusion area boundary | 12,360,108.313706   | 3,879,019.384729 |
| 64       | Exclusion area boundary | 12,360,027.207241   | 3,879,245.003700 |

### 2.7.5 UXO Surface Sweep

The UXO Team will conduct an instrument-aided visual UXO surface sweep of the AOC. Metal detectors will be used to aid in locating surface metal and debris. If a UXO item is encountered, its location will be measured with the GPS and recorded, and the UXO Team will determine its condition prior to proceeding with the sweep. No intrusive actions will be conducted during the surface sweep activities.



All fuzed UXO items will be disposed of in-place unless it can be determined that no explosive hazard remains. Unfuzed UXO items which may contain explosive residue may be consolidated for later disposal. MD will be removed from the AOC and secured for later disposition. All other metal scrap will be removed from the AOC and consolidated to aid in the follow-on geophysical effort.

## **2.8 MUNITIONS DEBRIS MANAGEMENT AND DISPOSAL**

MD recovered during this project will be 100% visually inspected for the presence of explosives or related materials and if required, explosive treatment will be performed by the UXO Team with supervision by the SUXOS. MD verified to be free of explosives or related materials will be consolidated in a secure container. KGS will provide NASA with documentation (e.g., a Form DD-1348, or similar) certifying that “The MD have been 100% inspected and to the best of our knowledge and belief, are inert and or free of explosives or related material.” Certified MD will be transferred to NASA with recommendations that the material be treated by a permitted smelter. All other scrap will be left at a NASA designated location.

## **2.9 LESSONS LEARNED**

Lessons learned will be recorded in the site logbook and will be discussed during the next day’s safety meeting.

### 3.0 EXPLOSIVES MANAGEMENT PLAN

This Explosive Management Plan has been prepared to document the approach, procedures, and requirements for managing explosives required for the detonation of MEC identified on site.

#### 3.1 GENERAL REQUIREMENTS AND LICENSING

The explosives acquired for and used for this project will be managed in accordance with Federal Acquisition Regulations (FAR) 45.5, local and state laws and regulations, Alcohol Tobacco and Firearms Pamphlet (ATFP) 5400.7, DoD 6055.9-STD, Department of Transportation (DOT) regulations, NASA Safety Manual/NASA Safety Standards (NSS) 1740.12, and NASA Procedural Requirements (NPR) 1600.1.

KGS shall have and, upon request, make available to any local, state, or federal authority a copy of the Alcohol Tobacco and Firearms (ATF) license/permit authorizing the purchase, storage, transport, and use of explosives.

#### 3.2 EXPLOSIVES ACQUISITION AND MANAGEMENT

##### 3.2.1 Acquisition

No explosives will be maintained on site.

Any need for explosives will be “on call” and will only be that amount of explosives required to conduct the demolition for that day’s findings, as determined by the UXO Team.

Explosives to be acquired for this project by SERES ES consist of:

| ITEM                             | QUANTITY             |
|----------------------------------|----------------------|
| Shock tube lead line             | 1 each, 2500 ft roll |
| Blasting caps, Shock tube, 16 ft | 1 box, 25 each       |
| Conical Shaped Charge, 19 gram   | 1 box, 10 each       |
| Detonating Cord, 80 grain per ft | 100 ft roll          |

##### 3.2.2 Initial Receipt

The SUXOS and UXOSO/UXOQCS will be responsible for receipt of explosives from the commercial vendor and will follow all applicable WFF procedures. The SUXOS will coordinate all receipt and management of explosives with the NASA POC before receipt and transportation of explosives to the site. The NASA POC will provide KGS with a copy and an understanding of all WFF explosive management requirements before the transportation of any explosives required for this project prior to commencement of field activities.

The explosives delivered to the site will be inspected to the level necessary to confirm the content and quantity of the delivery. Discrepancies will be reconciled at the time of receipt with the SUXOS, vendor, UXO Manager, and PM. Documentation will address the discrepancy and the resolution.

### **3.2.3 Storage**

No explosives will be maintained on site.

### **3.2.4 Transportation**

Explosives will be requested by the SUXOS, supplied on-call by a commercial vendor to the work site, and transported to disposal locations at the project site in accordance with NASA WFF procedures and ATF licensing requirements.

Transportation onsite by vehicles is not anticipated because of the closeness of the site to vehicle access. In the event transportation is required onsite, transportation vehicle will have a wooden bed liner and be equipped to secure the containers in the vehicle.

### **3.2.5 Receipt Procedures**

Each item of explosives will be receipted from initial delivery to WFF until the item is expended. SERES ES will provide a list of individuals authorized to receive, issue, transport, and use explosives by position title and those individuals shall assume accountability by signing the receipt documents. The end user of explosives shall certify in writing that the explosives were used for their intended purpose. Receipt document shall be reconciled at time of delivery, issue, disposal, and during each week's inventory. Any discrepancies will be documented by the SUXOS and reported to the FOL, PM, NASA POC, and others as required by law.

### **3.2.6 Inventory**

As noted above, any need for explosives will be "on call" and will only be that amount of explosives required to conduct the demolition for that day's findings, as determined by the UXO Team. No explosives will be maintained on site.

All explosives that are delivered to the site will be physically inventoried upon arrival by the SUXOS and UXOSO/UXOQCS. Any discrepancies will be documented by the SUXOS and reported to the FOL, PM, NASA POC, and others as required by law.

The following procedures will be followed by the SUXOS and UXOSO/UXOQCS upon discovery of lost, stolen, or unauthorized use of explosives:

1. Immediately notify the FOL, PM, and NASA POC by telephone and follow up with a written report within 24 hours.
2. Proper authorities shall be notified in writing within 24 hours of the event.

Any explosives not expended during the daily demolition operations will be issued and used during a final clean-up shot. There will be no excess explosive inventory to warehouse or ship.

Documents will be completed showing final disposition of all explosives.

### **3.2.7 Forms and Documents**

SERES ES will use corporate designed forms and documents to comply with the requirements of this plan.

## **4.0 EXPLOSIVES SITING PLAN**

The following Explosives Siting Plan has been prepared to direct KGS activities in the performance of this Task Order.

### **4.1 ORDNANCE AND EXPLOSIVES AREAS**

The MSDs for nonessential personnel, (based on DDESB TP 16 and the known/suspected munitions) during ordnance and explosives (OE) operations, at the Visitor Center shall be 200 ft. The MSD shall be an arc of 200 feet from the outermost boundary of the AOC, as illustrated on **Figure 3**. This MSD shall be maintained during all active operations, unless engineering controls are used to control fragmentation. If munitions other than the 20mm or 30mm rounds anticipated are identified or encountered during operations, the separation zone will be adjusted to be the maximum fragmentation distance for that munition. The maximum fragmentation distance will be used for intentional detonations unless engineering controls are employed.

### **4.2 PLANNED OR ESTABLISHED DEMOLITION AREAS**

There is not a planned or established demolition area for this project.

### **4.3 BLOW-IN-PLACE**

The MSD for all personnel shall be the greater of 200 feet or the maximum fragmentation distance for intentional detonations, unless engineering controls are used to reduce that distance.

### **4.4 COLLECTION POINTS**

The UXO team will normally detonate munitions in-place.

Collection points, if used, shall have the same MSD as identified above. MEC that is acceptable to move may be relocated to designated collection points within the AOC to reduce the number of demolition shots and the fragmentation contamination. Hazard classification and movement of MEC/MPPEH will be conducted in accordance with Naval Sea Systems Command (NAVSEA 2020) Ordnance Pamphlet 5 (OP 5). MEC safe-to-move decisions will be documented in writing prior to movement.

The exception is when the SUXOS in collaboration with the UXOSO determine that the risk associated with movement is acceptable, and that movement is necessary for the protection of people, property, or critical assets, or for the efficiency of the operation. In such cases, the SUXOS and UXOSO may evaluate the munition and authorize its movement within the MRS. The risk determination agreement will be documented in writing prior to movement via logbook or electronically.

### **4.5 IN-GRID CONSOLIDATED SHOTS**

The MSD for all personnel shall be the greater of 200 feet, or the maximum fragmentation distance as identified above, unless engineering controls are applied.

### **4.6 EXPLOSIVES STORAGE MAGAZINES**

No explosives will be stored on site. Explosives storage magazines will not be utilized.

## 4.7 QUALITY CONTROL

All documentation will be available to NASA personnel. Operational and test procedures shall conform to the manufacturer's standard instructions.

QC of the instrument's data will be achieved daily by field testing, checking the sensor and navigation system against a known target to ensure that they are operating properly. All field equipment used to gather and generate field data will be calibrated, as applicable, with sufficient frequency and in such a manner that accuracy and reproducibility of the results are consistent with the manufacturer's specifications.

As noted previously, a Schonstedt® magnetometer (such as the GA-52Cx or similar model) will be used for UXO sweep operations and these magnetometers do not require calibration.

Calibration, repair, or replacement records will be filed and maintained by the UXOQCS. In lieu of onsite calibrations and repairs, malfunctioning equipment will be returned to the vendor and replacement equipment will be procured.

## 4.8 EQUIPMENT STANDARDIZATION

The following out-of-box tests will be conducted when the equipment is delivered to the site:

- Inventory and inspect all components.
- Assemble the equipment and power up.
- Equipment/Electronics warm-up: The purpose of this test is to minimize sensor drift due to thermal stabilization. Most instruments need a few minutes to warm up before data collection begins. All manufacturer instructions will be followed or, if none are given, data reading will be observed until they stabilize. Acceptance Criteria: Equipment Specific (typically 5 minutes). This test will be conducted each time the unit is started.
- IVS Response Test (Schonstedt): The established IVS will be used to verify the audio response of the equipment to the standard OPs. The response to each of the OPs will be recorded in the field logbook.

The following tests will be conducted on the first day of the survey:

- Equipment/Electronics warm-up: This test will be conducted each time the unit is started.
- IVS Response Test (Schonstedt): The established IVS will be used to verify the audio response of the equipment to the standard OPs. The response to each of the OPs will be recorded in the field logbook.
- Personnel Test: The purpose of this test is to ensure survey personnel have removed all potential interference sources from their bodies. Common interference sources are ballpoint pens, steel-toe boots, or large metallic belt buckles, which can produce data anomalies similar to OE targets. All personnel who will be coming within close proximity of the sensor during survey operations must approach the sensor and have a second person monitor and record the results. Acceptance Criteria: no instrument response during personnel test. This test will be conducted at the beginning of each day.

The following tests will be conducted daily before (except repeat data at the end of the day) starting data collection.

- Equipment/Electronics warm-up: This test will be conducted each time the unit is started.
- Personnel Test: This test will be conducted at the beginning of each day.
- Repeat Data: The purpose is to determine positional data repeatability. In addition to start-of-day data collection on IVS, the process will be repeated at least once per day. The repeat data will be reviewed and evaluated immediately. Acceptance Criteria: Repeatability of Positional Accuracy +/- 20 cm. This repeat test will be conducted once per day.

| <b>Table 4-1: Quality Control Methods and Pass/Fail Criteria for Visitor Center Munitions and Explosives of Concern (MEC) Surface Sweep</b><br>NASA Wallops Flight Facility, Wallops Island, Virginia |   |  |   |                             |  |
|---|---|--|---|-----------------------------|--|
| Field Activity  | Method of Inspection  | Frequency of Inspection                              | Pass/Fail Criteria  | Applicable Standard         | Corrective Action for Nonconformance                               |
| Site Prep: setup MDAS storage   | Performance audit   | As activities are completed                          | All work and equipment meets applicable project specifications            | WP                          | Re-do nonconforming work; replace or repair faulty equipment       |
| GPS Location Tagging  | Tag of a benchmark/monument, if available and as provided by NASA | At the beginning and end of each day the GPS is used | Survey work meets applicable project specifications for accuracy          | WP                          | Remedial training for operator; replace or repair faulty equipment |
| IVS test Instrument   | Audio response over ISO item                                      | Daily at start and end of each day                   | IVS seeds detected  | WP                          | Replace or repair faulty equipment                                 |
| IVS test Operator   | Interpreted position of installed targets                         | Daily at start and end of each day                   | IVS seeds detected  | WP                          | Remedial training for operator.                                    |
| MPPEH Inspection  | Recovered item re-inspection                                      | Daily re-inspection of 10% of MDAS items             | All cavities are exposed, and no potential explosive hazards are present  | WP, DoD instruction 4140.62 | Re-inspect all MDAS certified that day                             |
| MEC Detonations   | Performance Audit   | Daily  | All work and equipment meets applicable project specifications            | WP                          | Stop work and correct deficiencies before proceeding               |
| MDAS Management   | Performance Audit   | Daily  | All paperwork is completed, and material properly stored at the work site | WP                          | Stop work and correct deficiencies before proceeding               |

Acronyms and Abbreviations:

GPS = global positioning system  
 IVS = instrument verification strip  
 MDAS = material documented as safe

MEC = munitions and explosives of concern  
 MPPEH = material potentially presenting an explosive hazard  
 WP = Work Plan

## **4.9 ANOMALY AVOIDANCE**

KGS will have a UXO Tech II onsite to perform anomaly avoidance during all work inside the surface sweep area and exclusion area, including during installation of the IVS. The UXO Tech will utilize a Schonstedt®, such as the GA-52 CX or similar magnetometer, to assist in OE avoidance. KGS will install an IVS outside of the sweep area, in an area which has been cleared by the UXO Tech, and the UXO Tech will supervise the IVS installation.

## **4.10 DATA COLLECTION VARIABLES**

All instruments will be checked at a minimum of twice daily – at the beginning and end of the day – to ensure proper functioning throughout the day. Malfunctioning or inoperable units will be taken out of service until they can be repaired or replaced.

RTK-GPS units will be checked and used in accordance with manufacturer's instructions, and their use will be documented by recording unit serial numbers in a logbook. Existing monuments will be used for the RTK-GPS devices for function checks. The location of any MEC/MPPEH will be measured and recorded using the RTK-GPS unit, the coordinates recorded in the field logbook, the item marked using bright colored ribbon and/or pin-flags, and a general description of the item and its location recorded in the field logbook.

## **4.11 DATA ANALYSIS AND INTERPRETATION**

The site surface sweep activities will generate a list of coordinates (i.e., GPS points) where subsurface anomalies were identified and left in-place (no intrusive work is included in this task). This list of points and locations will be provided to NASA in hard copy and electronic format, along with a map depicting the area surveyed and any subsurface anomalies detected (and left in-place). The map will be transmitted electronically and compatible with the specific Geographical Information System (GIS) platform in use. The map will be oriented to Virginia State Plane Coordinate System, South Zone, North American Datum 1983 (NAD 83), to be consistent with existing NASA WFF Environmental Geographical Information System (EGIS).

KGS will perform data file QC review and correction as necessary.

## **4.12 REACQUISITION**

Targets on the IVS will be reacquired using the RTK-GPS and an analog handheld detector (Schonstedt ®). The distance from each reacquired target and the target's actual location will be measured and recorded to evaluate the effectiveness of the reacquisition process.

## **4.13 RECORDS MANAGEMENT**

All site activities will be memorialized in the site logbook and/or appropriate field data sheets. Project documentation will be managed on-site during the life of all field activities for inspection by NASA personnel. Copies of the logbook and field data sheets will be provided as an attachment to the final completion report.

GPS data points will be recorded digitally and downloaded periodically to a field computer for review in the field. In addition to the copy of data placed on the field computer's hard drive, a copy of the data will be backed up before the data are erased from the equipment.

The project SUXOS and UXOQCS will review the downloaded data to verify that the download system is functioning properly. This review will also serve to check the field data for QC review purposes. The review will verify that the data is valid and useable for the intended purpose.

#### **4.14 RECORDS MANAGEMENT**

All raw data files, final processed data files, hard copies, and field notes will be maintained for the duration of the project. KGS will transmit data to NASA personnel following completion of the project. All raw files will be available on-site for QC checks to assure field and data processing procedures during site activities.

#### **4.15 REPORTING**

Copies of the logbook and field data sheets will be provided as an attachment to the final completion report. The final report will be provided to NASA personnel at the completion of the project.

#### **4.16 COMPLETION REPORT**

After the site sweep and UXO disposition field work has been completed, KGS will prepare a completion report to include the following:

- Summary of the activities and results including equipment used, techniques, methodologies, and any deviations from planned activities.
- As-built drawing of the sweep area.
- Scaled map and list of coordinates for subsurface anomalies (left in place).
- All raw and processed data.



## **5.0 GEOPHYSICAL PROVE-OUT PLAN AND REPORT**

Section not required.

## **6.0 GEOPHYSICAL INVESTIGATION PLAN**

Section not required.

## 7.0 LOCATION SURVEYS AND MAPPING PLAN

This Location Survey and Mapping Plan have been prepared to direct all activities in locating, tracking, and documenting MEC occurrence within the AOC.

### 7.1 SITE GRID

KGS will establish a site grid that encompasses the entire AOC (**Figure 5**). The SUXOS will direct the establishment of the grid and establish the grid numbering and coordination system that will be used to record all findings during the clearance operation. The points listed in **Table 2-2**, which define the sweep area boundary and the corners of each grid within the sweep area, will be established using a RTK-GPS.

Field logbooks will be used during each phase of the clearance operation to record significant findings and information using the established grid and coordinate system. The location of each piece of UXO will be tagged using the GPS, and the following data will be recorded in the logbook for each object: the alphanumeric identifier of the grid in which the UXO object is located (**Figure 5**), the date and time that the object was identified, the tagged coordinates of the object from the RTK-GPS, and the measured distance in decimal feet (using tape measures) from the object to at least two grid node stakes (to define XY within the grid via triangulation). The stakes will be numerically identified as shown in **Table 2-2** and **Figure 5**.

The Completion Report will present a georeferenced map of the area cleared, provide the coordinates (northing and easting) of the area in a coordinate system consistent with the system used by NASA WFF to record and manage areas of concern, and will detail the location of each grid stake and UXO item found/removed. GPS coordinate data recorded in the field will be converted, as necessary, to the Virginia State Plane Coordinate System, South Zone, NAD 83, to be consistent with existing NASA WFF mapping. The Completion Report will also provide observations made by the UXO Team and recommendations for future maintenance activities, if appropriate.

### 7.2 UNEXPLODED ORDNANCE SAFETY PROVISION

During all initial fieldwork and all site activities, a UXO Technician II or higher will accompany any non-UXO site visitors. The UXO Technician II shall conduct visual surveys for surface ordnance prior to the any personnel entering a suspected area, and a magnetometer survey of each area where field personnel intend to drive stakes.

## **8.0 WORK, DATA, AND COST MANAGEMENT PLAN**

The technical reports and submittals under this SOW include this project WP, APP/SSHP, an AM, and a Completion Report (to be provided at the end of field activities). KGS will use Microsoft Office software, specifically Word and Excel, to prepare these documents.

## **9.0 PROPERTY MANAGEMENT PLAN**

No government property will be purchased or acquired in the performance of this Task Order. Subcontractors will not be authorized to acquire or control government property.

## 10.0 CONTRACTOR QUALITY CONTROL PLAN

This Contractor Quality Control Plan (CQCP) was developed to identify and implement quality requirements to ensure that overall project activities are accomplished using an acceptable level of internal controls and review procedures. The intent of such controls is to eliminate conflicts, errors, and omissions and ensure the technical accuracy of all deliverables. Field work under this Task Order shall include the following:

- Mobilization of equipment and personnel to the project site.
- UXO surface sweep of AOC.
- UXO escort/avoidance for UXO during surface sweep operations.
- Identification of MPPEH and MD type and/or condition of the ordnance and its location and reporting to NASA POC.
- Disposal of MEC discovered during surface sweep operations.
- UXO escort support to identify potential UXO and warn non-UXO personnel of hazards.
- Demobilization of equipment and personnel.

The requirements presented in this CQCP are intended as overall quality assurance (QA) and QC requirements that are applicable to all administrative, engineering, and technical activities associated with the Task Order. The requirements of this plan are applicable to all KGS personnel and their subcontractors unless an alternate QC Plan, which is consistent with or exceeds the requirements of this document either in whole or in part, is used.

### 10.1 PROJECT ORGANIZATION AND RESPONSIBILITIES

Under the direction of NASA, KGS will provide a staff of experienced administrative and technical professionals to serve as key personnel responsible for implementing QC requirements associated with this project. These personnel will be selected for their management and technical abilities, and will include the following core employees:

- PM
- FOL
- SUXOS
- UXOSO/UXOQCS
- UXO Team Leader
- UXO Technicians

Some individuals may be required to perform multiple functions in order to efficiently maintain progress at the site. A discussion of roles and responsibilities is presented in Section 2.

### 10.2 QUALITY REQUIREMENTS

The quality requirements associated with field activities in support of this Task Order are defined in **Table 10-1**. These requirements apply to all field activities that affect the quality of work and work products.

Quality Control checks will be conducted as follows:

- Daily Briefings - The UXOSO will ensure that daily safety and operational briefings are conducted routinely.
- Communications - Positive communications with the NASA POC and site personnel will be maintained throughout the workday.
  - At a minimum, communication checks will be conducted each morning prior to starting work. Additional checks will be performed as necessary throughout the workday to monitor progress, safety, and/or QC.
  - Teams will not start operations until satisfactory checks have been achieved.
- Training - The SUXOS/UXOSO will ensure that initial site-specific training is performed for all field personnel prior to startup of field activities, and that all safety control measures have been established. Training will be accomplished using only approved training materials. The UXOSO will ensure that all certifications are filed on-site and are available for NASA inspection.
- Documentation - The SUXOS/UXOSO will ensure the completion of all documentation listed in Section 10.3.
- Review - The SUXOS and FOL will be responsible for supervising all site activities including the following:
  - Supervision of KGS personnel and subcontractor staff.
  - Compliance with WP, CQCP, and SSHP.
  - Adhering to the contract schedule.
  - Review and submission of all daily and job status reports and documentation.
  - Direct daily communication with the PM.

### 10.3 FIELD DOCUMENTATION

All field activities affecting QC will be performed in accordance with documented procedures, instructions, or drawings identified in the SOW, WP, or applicable DIDs. During all field activities, KGS will use the following reporting forms:

- Daily Equipment Checklist
- Quality Control Daily Report
- Field Logbooks

The SUXOS will maintain a field logbook of all inspection and testing activities. This daily logbook will be used in preparing the QC Daily Report. The QC Reports will be submitted with the Summary Report. Reports will not be prepared for days on which no work is performed. At a minimum, one report will be submitted for every seven days of no work and on the last day of a period of work stoppage. Daily Reports will be signed and dated by the SUXOS and FOL. Summary Reports will be signed by the PM.

The QC Daily Reports and the Summary Report shall include summaries of the following:

- Contractor/subcontractors and responsibilities.

- Equipment used.
- Location, personnel, and description of work for each day.
- Safety evaluations including a description of inspections, results, and any corrective actions.

| <b>Table 10-1: Quality Requirements for UXO Support at NASA WFF Visitor Center</b><br>NASA Wallops Flight Facility, Wallops Island, Virginia |                                   |  |   |
|--|-----------------------------------|--|---|
| <b>Objective</b>   | <b>Activity</b>                   | <b>Activity Quality Requirement</b>  | <b>Quality Control Verification</b>   |
| Prepare Site   | Mobilization and Site Preparation | Mobilize equipment and personnel, and prepare site as described in the WP.   | <ul style="list-style-type: none"> <li>• Daily Site Health and Safety Meeting Report</li> <li>• Field Logbooks</li> </ul>   |
| Site-work  | UXO Surface Sweep                 | <p>UXO Technicians, supervised by a UXO Team Leader, will complete a surface sweep of the AOC.</p> <p>QC checks will be performed to ensure anomalies 20 mm or larger on the surface have been located, identified, and removed.</p> <p>Fail criteria will be any anomaly 20 mm or larger or a MEC item remaining in the AOC.</p> <p>Recovery of blind seeds during the sweep is a positive way of showing that known items were recovered which supports the argument of successful detection and through coverage.</p> | <ul style="list-style-type: none"> <li>• QC Daily Report</li> <li>• Daily Site Health and Safety Meeting Report</li> <li>• Daily Equipment Checklist</li> <li>• QA Audit Checklist and Audit Form</li> <li>• Health and Safety Compliance Inspection</li> <li>• Field Logbooks</li> <li>• QC 10% of area cleared during surface sweep.</li> <li>• Blind seeds will be introduced into the grids by the UXOQCS.</li> </ul> |
| Site-Work  | UXO Escort Support                | <p>UXO Technician will conduct anomaly avoidance while conducting UXO Escort Duties.</p> <p>QC checks will be performed to ensure no anomalies are moved or disturbed during this phase of the project.</p> <p>Fail criteria will be any anomaly moved or disturbed.</p>   | <ul style="list-style-type: none"> <li>• QC Daily Report</li> <li>• Daily Site Health and Safety Meeting Report</li> <li>• Daily Equipment Checklist</li> <li>• QA Audit Checklist and Audit Form</li> <li>• Health and Safety Compliance Inspection</li> <li>• Field Logbooks</li> <li>• QC/observe UXO Escort duties.</li> </ul>  |



| <b>Table 10-1: Quality Requirements for UXO Support at NASA WFF Visitor Center</b><br>NASA Wallops Flight Facility, Wallops Island, Virginia |                     |   |   |
|--|---------------------|---|---|
| <b>Objective</b>   | <b>Activity</b>     | <b>Activity Quality Requirement</b>   | <b>Quality Control Verification</b>   |
| Site-Work  | MEC Disposal        | UXO Technicians supervised by a UXO Team Leader will conduct MEC disposal. QC checks will be performed to ensure MEC disposal is conducted in a safe and effective manner. Fail criteria will be any unsafe or ineffective MEC disposal operation.    | <ul style="list-style-type: none"> <li>• QC Daily Report</li> <li>• Daily Site Health and Safety Meeting Report</li> <li>• Daily Equipment Checklist</li> <li>• QA Audit Checklist and Audit Form</li> <li>• Health and Safety Compliance Inspection</li> <li>• Field Logbooks</li> <li>• QC/observe MEC disposal operation.</li> </ul>             |
| Site-Work  | Scrap Certification | UXO Technicians supervised by the SUXOS will conduct scrap certification. QC checks will be performed to ensure no energetic material remains in the Certified Scrap. Fail criteria will be any energetic material discovered in the Certified Scrap. | <ul style="list-style-type: none"> <li>• QC Daily Report</li> <li>• Daily Site Health and Safety Meeting Report</li> <li>• Daily Equipment Checklist</li> <li>• QA Audit Checklist and Audit Form</li> <li>• Health and Safety Compliance Inspection</li> <li>• Field Logbooks</li> <li>• QC/inspect scrap during certification process.</li> </ul> |
| Site-Work  | Demobilization      | Demobilize equipment and personnel according to schedule.   | <ul style="list-style-type: none"> <li>• Daily Site Health and Safety Meeting Report</li> <li>• Health and Safety Compliance Inspection</li> <li>• Field Logbooks</li> </ul>  |

#### 10.4 AUDITS

Field performance will be evaluated to ensure that the quality standards and objectives of the WP are met. The evaluation will be accomplished through audits of the QC Daily Reports. Audits will be conducted, and corrective actions will be implemented when non-conformances or deficiencies are identified. Additional audits will be conducted periodically. The audits will be planned and conducted by the Program or Project QC Manager. Procedures for auditing activities will be identified prior to implementation of the audits.

The audit process will involve identifying non-conformances or deficiencies, reporting and documenting them, initiating corrective actions through appropriate channels, and following up with a compliance review. Records will be kept of all auditing tasks and findings on the QA Audit Checklist and Audit Notes.

The field teams involved with all site work are responsible for reporting any suspected technical non-conformances or deficiencies to the Program Manager. The Program QC Manager is responsible for evaluation of the situation and taking action, if any is required, after following the notification protocol.

## **11.0 ENVIRONMENTAL PROTECTION PLAN**

An Environmental Protection Plan is not required for the performance of this Task Order. The project team will not be disturbing wetlands and will not be conducting excavations of the size and type that warrant an Erosion Control Plan (only small holes for stakes and for installation of an IVS).

## **12.0 INVESTIGATIVE DERIVED WASTE PLAN**

An Investigative Derived Waste (IDW) Plan is not required for the performance or completion of this Task Order. The project team will not be producing IDW. Scrap metal removed from the site will be placed in a sealed container and turned over to NASA for disposition. MD handling requirements are described in Section 2.8.

## **13.0 GEOGRAPHICAL INFORMATION SYSTEMS PLAN**

This GIS Plan has been prepared to be consistent with the GIS maintained for the NASA WFF Environmental Group and used by the NASA WFF Facilities Management Division.

### **13.1 DATA RECORDING AND REPORTING**

All locational and coordinate grid system data will be recorded in accordance with Section 7.0 of this WP. The recorded information will be provided to NASA for its incorporation into the existing EGIS established for NASA WFF. A georeferenced map showing all coordinates and MEC findings will be included in the Completion Report. GPS coordinate data recorded in the field will be converted, as necessary, to the Virginia State Plane Coordinate System, South Zone, NAD 83, to be consistent with existing NASA WFF EGIS.

## **14.0 INTERIM HOLDING FACILITY SITING PLAN FOR RCWM PROJECTS**

No Recovered Chemical Warfare Materiel (RCWM) is expected under this Task Order. A RCWM Interim Holding Plan is not required for this Task Order.

## **15.0 PHYSICAL SECURITY PLAN FOR RCWM PROJECTS SITES**

No RCWM are anticipated under this Task Order. A RCWM Security Plan is not required under this Task Order.

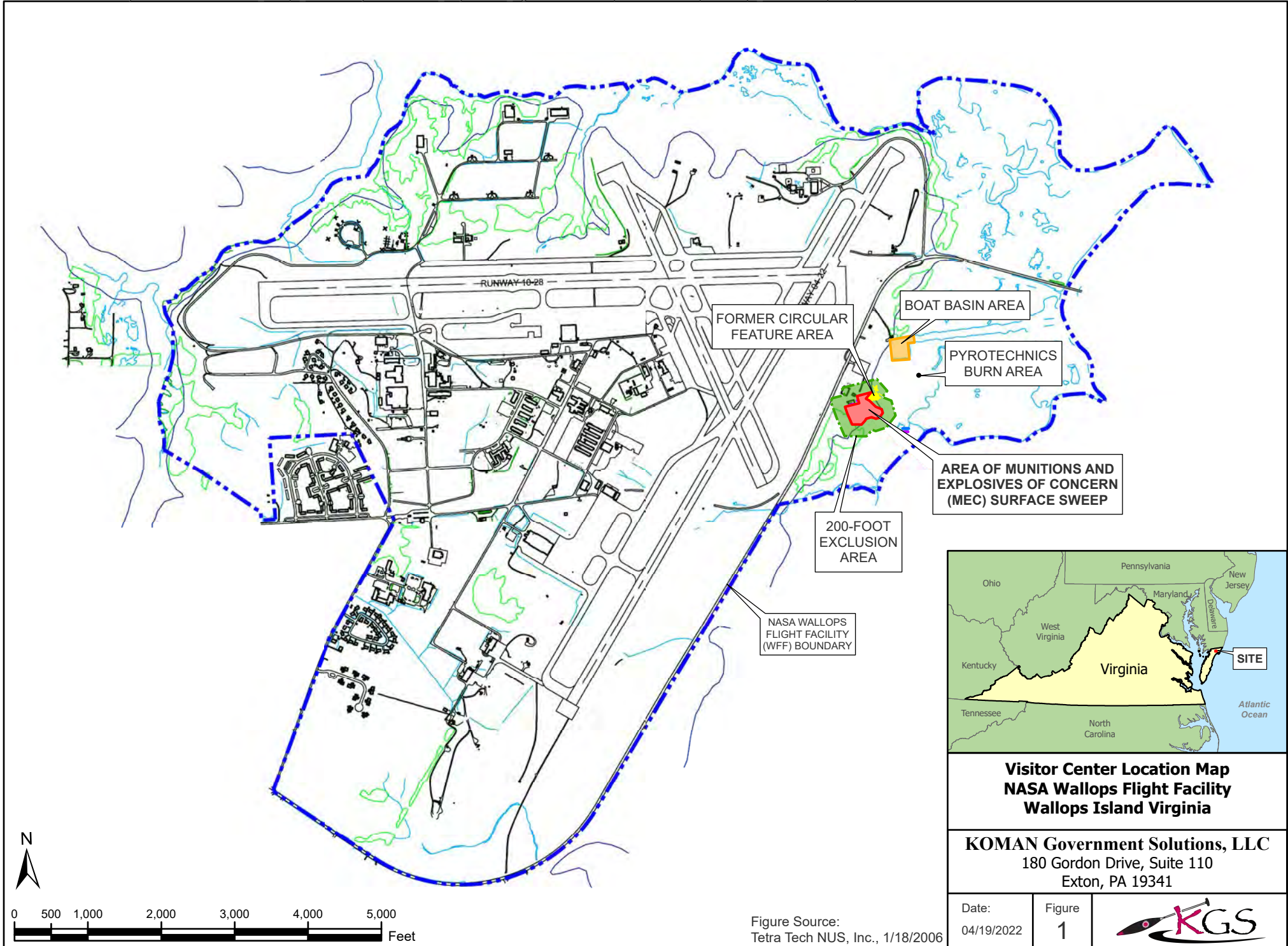
## 16.0 REFERENCES

- Ebasco, 1990. *Wallops Flight Facility Remote Sensing Report, Draft*; June 1990.
- Metcalf & Eddy, 1991. *Site Assessment of the Boat Basin/Visitor Center Complex*; July 1991.
- NAVSEA, 2020. *Ordnance Pamphlet 5 (OP 5 or OP-5)*
- U.S. Army Corps of Engineers (USACE), 2000. *Ordnance and Explosives Response*, EP-1110-1-18. April.
- USACE, 2002. *Personnel/Work Standards, USACE DID OE-025.01*.
- USACE, 2005. *Archive Search Report for NASA – Wallops Flight Facility Accomack County, Virginia*; October.
- USACE, 2009. *OE-005-01-01 for a Type II Work Plan*, U.S. Army Engineering and Support Center, Huntsville, Alabama.
- USACE, 2013. *Safety – Explosives, Safety and Health Requirements Manual, EM 385-1-97*, April.
- USACE, 2014. *Safety and Health Requirements for Operations and Activities Involving Munitions and Explosives of Concern, ER-385-1-95*. December.
- USACE, 2016. *Final Technical Memorandum #2 Anomaly Investigation Results and Sampling Investigation*, Military Munitions Response Program Project 7 Boat Basin, Visitors Information Center, February.

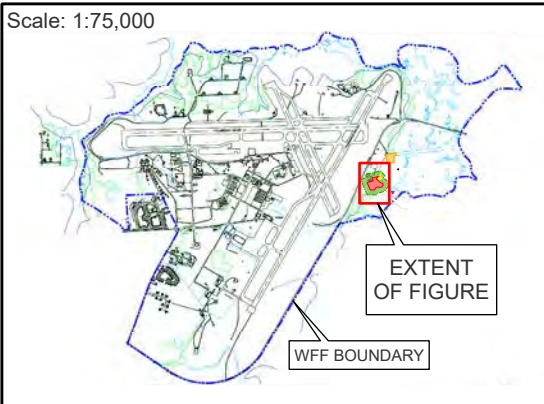
---





## FIGURES





Scale: 1:75,000



-  AREA OF MUNITIONS AND EXPLOSIVES OF CONCERN (MEC) SURFACE SWEEP
-  200-FOOT EXCLUSION AREA
-  APPROXIMATE LOCATION OF FORMER FIRING-IN BUTT
-  APPROXIMATE LOCATION OF FORMER GUN MOUNTS

**Visitor Center Site Map  
NASA Wallops Flight Facility  
Wallops Island Virginia**

**KOMAN Government Solutions, LLC**  
180 Gordon Drive, Suite 110  
Exton, PA 19341

Date:  
04/19/2022

Figure  
2

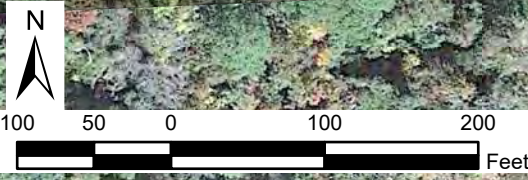
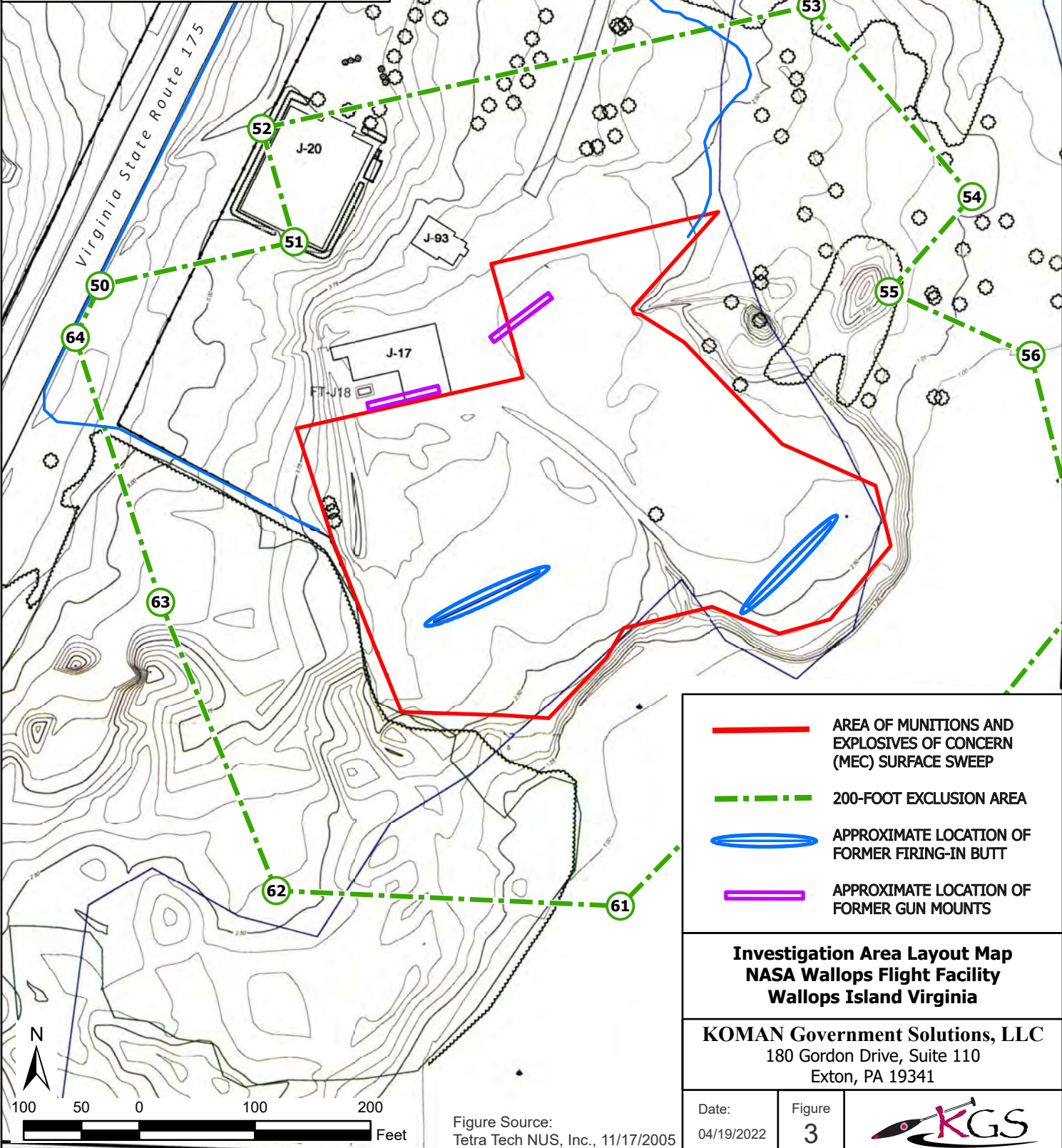
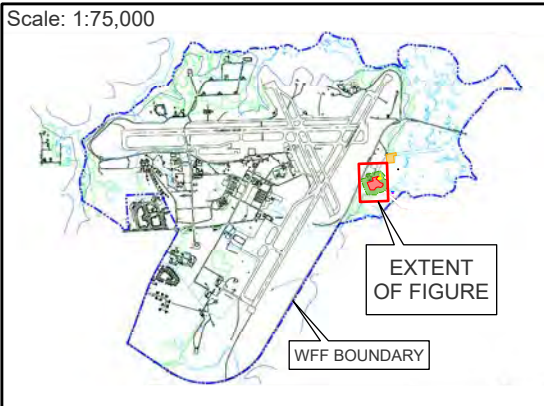






Figure Source:  
Tetra Tech NUS, Inc., 1/19/2006

Path: X:\Shared\KGS\PR\JA1 Projects\BLUESTONE ENV\001\_Wallops\_UXO\B - Project\GIS\2022-04\_Project Plans\_Figures\2202-04\_Workplan\Wallops\_2202-04\_Workplan.aprx

Scale: 1:75,000



-  AREA OF MUNITIONS AND EXPLOSIVES OF CONCERN (MEC) SURFACE SWEEP
-  200-FOOT EXCLUSION AREA
-  APPROXIMATE LOCATION OF FORMER FIRING-IN BUTT
-  APPROXIMATE LOCATION OF FORMER GUN MOUNTS

**Investigation Area Layout Map  
NASA Wallops Flight Facility  
Wallops Island Virginia**

**KOMAN Government Solutions, LLC**  
180 Gordon Drive, Suite 110  
Exton, PA 19341

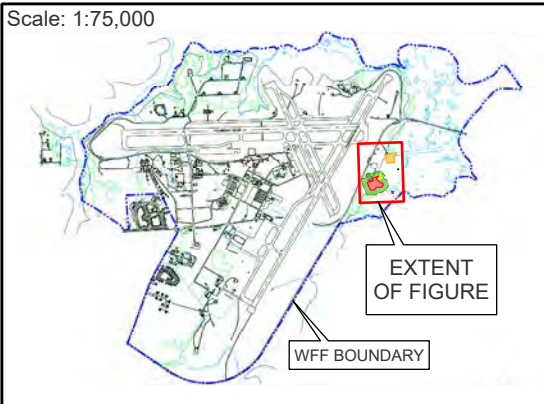
Date:  
04/19/2022

Figure  
**3**



Figure Source:  
Tetra Tech NUS, Inc., 11/17/2005

Scale: 1:75,000



Path: X:\Shared\KGS\PR\JA1 Projects\BLUESTONE ENV\001\_Wallops\_UXO\B - Project\GIS\2022-04\_Project Plans\_Figures\2202-04\_Workplan\Wallops\_2202-04\_Workplan.aprx

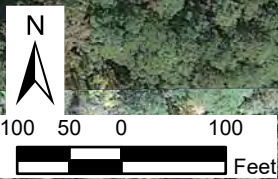
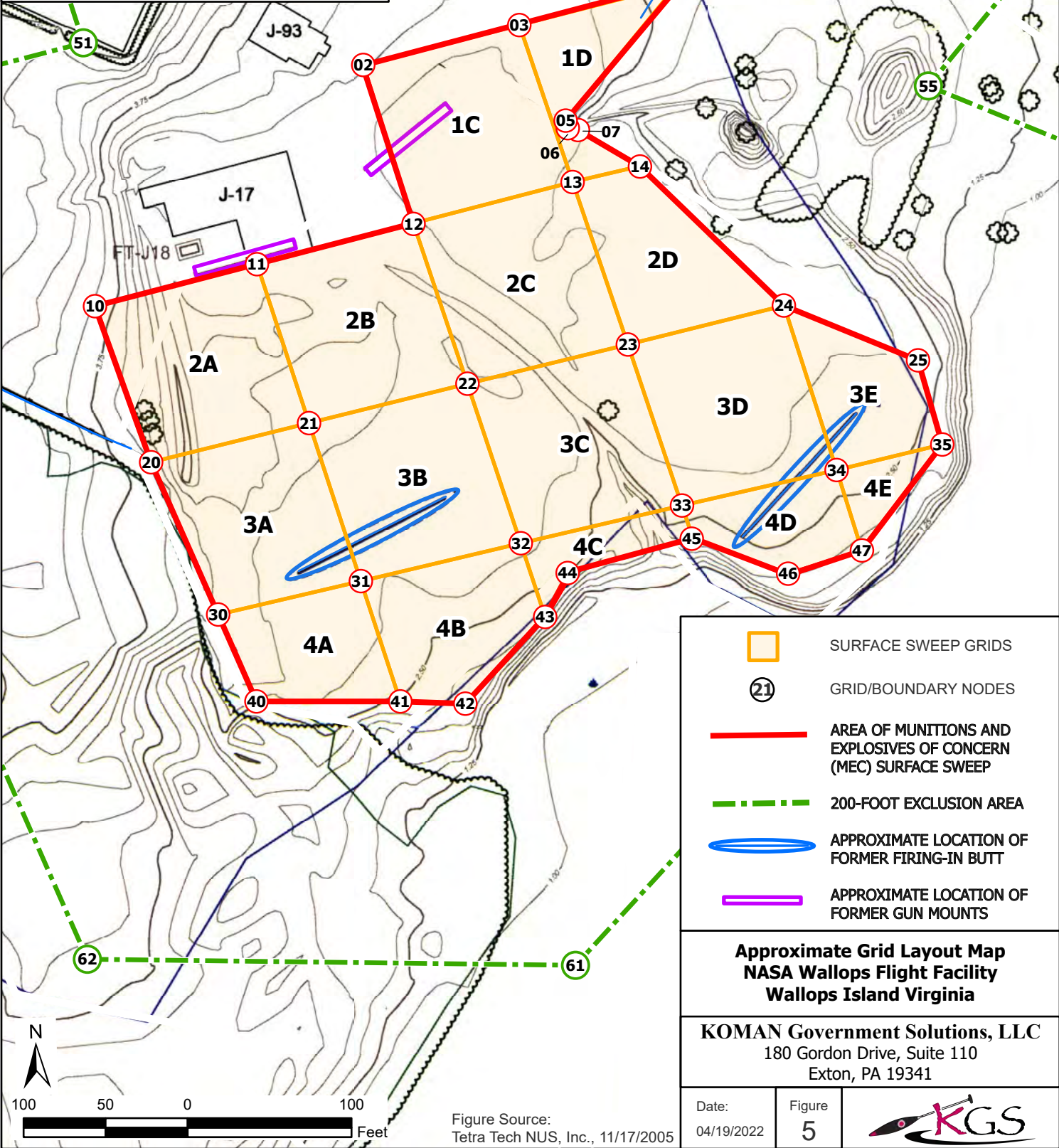
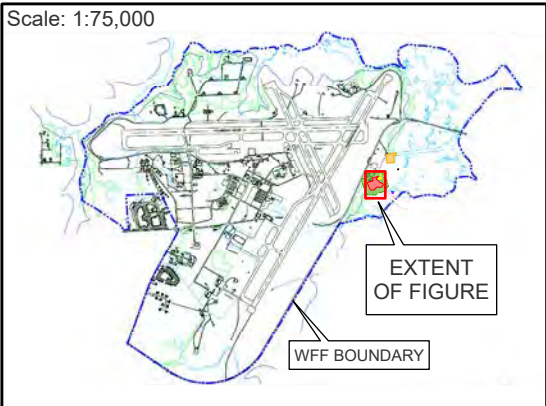








Figure Source:  
USACE Baltimore District

|   |             |  |
|---|-------------|--|
| <b>FUDS Project 7 Site Map<br/>NASA Wallops Flight Facility<br/>Wallops Island Virginia</b> |             |  |
| <b>KOMAN Government Solutions, LLC</b><br>180 Gordon Drive, Suite 110<br>Exton, PA 19341    |             |  |
| Date:<br>05/12/2022   | Figure<br>4 |  |

Scale: 1:75,000



-  SURFACE SWEEP GRIDS
-  GRID/BOUNDARY NODES
-  AREA OF MUNITIONS AND EXPLOSIVES OF CONCERN (MEC) SURFACE SWEEP
-  200-FOOT EXCLUSION AREA
-  APPROXIMATE LOCATION OF FORMER FIRING-IN BUTT
-  APPROXIMATE LOCATION OF FORMER GUN MOUNTS

**Approximate Grid Layout Map  
NASA Wallops Flight Facility  
Wallops Island Virginia**

**KOMAN Government Solutions, LLC**  
180 Gordon Drive, Suite 110  
Exton, PA 19341

Date:  
04/19/2022

Figure  
5



Figure Source:  
Tetra Tech NUS, Inc., 11/17/2005