FIELD SAMPLING PLAN ADDENDUM 2

Depleted Uranium Impact Area
Site Characterization – Soil Verification
Jefferson Proving Ground, Madison, Indiana

Final

Prepared for:

U.S. Department of Army
Installation Support Management Activity
5183 Blackhawk Road
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and

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Submitted by:

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Reston, Virginia 20190

Contract No: W912QR-04-D-0019
Delivery Order No. 0012

July 2006

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COMMITMENT TO IMPLEMENT THE ABOVE FIELD SAMPLING PLAN ADDENDUM

Joseph N. Skibinski Project Manager	(703) 810-8994 Telephone	7/7/06 Date
for Joseph E. Peters Joseph E. Peters Quality Assurance Officer	(703) 318-4763 Telephone	7/7/06 Date
Randy C. Hansen Health and Safety Officer	(314) 770-3027 Telephone	7/7/06 Date
Harold W. Anagnostopoulos Radiation Safety Officer/Radiation Protection Officer	(314) 770-3059 Telephone	7/7/06 Date
Seth T. Stephenson Field Manager	(765) 278-3520 Telephone	7/7/06 Date

The approved Field Sampling Plan (FSP) Addendum will be provided to subcontractors (i.e., drillers, surveyors, and laboratories) at the time of subcontract execution.

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CERTIFICATION 4

CONTRACTOR STATEMENT OF INDEPENDENT TECHNICAL REVIEW

Science Applications International Corporation (SAIC) has prepared this Field Sampling Plan (FSP) Addendum 2 for performing site characterization at Jefferson Proving Ground's Depleted Uranium Impact Area, located in Madison, Indiana. Notice is hereby given that an independent technical review has been conducted that is appropriate to the level of risk and complexity inherent in the project, as defined in the Quality Control Plan (QCP). During the independent technical review, compliance with established policy principles and procedures, utilizing justified and valid assumptions was verified. This included review of assumptions; methods, procedures, and material used in analyses; alternatives evaluated; the appropriateness of data used and level of data obtained; and reasonableness of the results, including whether the product meets the customer's needs consistent with law and existing Corps policy.

Joseph N. Skibinski — 7/7/06

Joseph N. Skibinski
Project Manager
Science Applications International Corporation

Date

JEP for Joseph E. Peters — 7/7/06

Joseph E. Peters
Quality Assurance Officer
Science Applications International Corporation

Date

Corinne Shia — 7/7/06

Corinne Shia
Independent Technical Review Team Leader
Alion Science and Technology Corporation

Date

Significant concerns and explanation of the resolutions are documented within the project file.

As noted above, all concerns resulting from independent technical review of the project have been considered.

7/7/06

Lisa D. Jones-Bateman
Vice President
Science Applications International Corporation

Date

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LIST OF FIGURES

LIST OF ACRONYMS

CHP	Certified Health Physicist
CSP	Certified Safety Professional
DO	Delivery Order
DOD	U.S. Department of Defense
DOE	U.S. Department of Energy
DU	Depleted Uranium
EOD	Explosive Ordnance Disposal
FSP	Field Sampling Plan
GPS	Global Positioning System
HASP	Health and Safety Plan
HPT	Health Physics Technician
IDW	Investigation-derived Waste
JPG	Jefferson Proving Ground
NCSS	National Cooperative Soil Survey
NGB	National Guard Bureau
NRCS	Natural Resources Conservation Service
NRC	U.S. Nuclear Regulatory Commission
PPE	Personal Protective Equipment
QC	Quality Control
SAIC	Science Applications International Corporation
SOW	Statement of Work
USACE	U.S. Army Corps of Engineers
USDA	U.S. Department of Agriculture
UXO	Unexploded Ordnance

1. INTRODUCTION

This document is the second Addendum to the previous Field Sampling Plan (FSP) (SAIC 2005a) prepared for the Depleted Uranium (DU) Impact Area Site Characterization Project for Jefferson Proving Ground (JPG), Madison, Indiana, in May 2005. Science Applications International Corporation (SAIC) has prepared this Addendum in accordance with the statement of work (SOW) requirements under the U.S. Army Corps of Engineers (USACE) Contract No. W912QR-04-D-0019, Delivery Order (DO) No. 0012.

This FSP Addendum documents and describes specific activities and details of the JPG DU Impact Area soil verification task that were not addressed in the FSP or have been modified from the information presented in the FSP. With this understanding, this Addendum follows the same format and relevant sections of the FSP are referenced. This document is to be used in conjunction with the existing FSP, not as a replacement. The information provided in this plan was developed for use by SAIC in support of JPG's site characterization program to assist with the soil verification. SAIC assumes no liability for the use of this information for any other purpose than as stated in this Addendum or the FSP.

The following is a brief scope of this task:

> Available relative published materials consisting of soil studies and mapping will be compiled and reviewed. Typical soil survey maps are prepared by the National Cooperative Soil Survey (NCSS). In addition, the U.S. Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) will be contacted to identify and acquire available materials. Reviewed materials will be used to select transects for field verification activities. After review of the published materials, onsite verification of the soil mapping units is proposed to confirm the soil characteristics related to the mapped soils, as well as any inclusions of similar or contrasting soil types, that need to be considered in interpretations on the site. Results of the soil verification task will be used to assist in developing future soil sampling plans, corrosion studies, K_d studies, and modeling of contaminant mobility.

Note that further details concerning the scope and objectives of the soil verification task are presented in Section 5 of the FSP (SAIC 2005a).

Additional information on the project schedule is provided in Section 2, investigation-derived waste (IDW) in Section 3, and data use and reporting in Section 4. Responsibility for work under a U.S. Nuclear Regulatory Commission (NRC) radioactive materials license is described in Section 5, and the references used in preparing this report are provided in Section 6.

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2. SOIL VERIFICATION PLAN

This section describes the soil verification activities to be conducted at JPG. The objective of this task is to identify existing soil types from the available published soil reporting and maps, which will be confirmed with field verification of the soil types. Following the review of the relevant available published materials, SAIC will conduct field verification activities during a planned 2-day field event. All field activities will be completed in accordance with the approved site Health and Safety Plan (HASP) (SAIC 2005b) and any relevant Addenda.

SAIC is proposing to complete the publications search and review prior to initiating the field verification task. Weather conditions will be assessed to determine if significant rain has occurred 2 days prior to mobilization of the field crew to JPG to conduct the soil verification. The schedule will be modified if significant rain has occurred in the preceding days. This decision criterion is based on the fact that most soils typically will drain below field capacity within 24 to 48 hours of a 1-inch rain event. Soils that have not drained by this time period are probably wet normally and this condition may be an indication of the presence of hydric soils and/or wetlands conditions. Soil colors are best characterized when moist, a condition desired for successful completion of the soil verification.

Because the entire DU Impact Area is north of the firing line where the potential to encounter unexploded ordnance (UXO) is likely, anomaly avoidance procedures will be followed[1]. This includes the scanning of work areas by visual and instrument surveys conducted by one of SAIC's qualified UXO specialists (i.e., graduate of the U.S. Department of Defense [DOD] Explosive Ordnance Disposal [EOD] School in Indian Head, Maryland). The surveyed areas will be temporarily marked until the completion of field activities. Non-UXO personnel will operate only within the designated cleared areas. All field work in nonscanned areas where UXO reasonably may be exposed at the surface will be subject to continuous surveillance by qualified UXO personnel. Additional safety precautions for work in UXO areas are included in Appendix D of the HASP Addendum (SAIC 2006).

The field soil verification task team will consist of a soil scientist, project hydrogeologist, SAIC's UXO specialist, and a Health Physics Technician (HPT). The SAIC soil scientist along with the hydrogeologist will identify transects across appropriate portions of the DU Impact Area for placement of shallow (up to 3 feet deep) soil hand auger borings to identify the field characteristics in order to confirm or identify the soil series. The number of hand auger borings completed will be determined in the field by the variability of the soils, physical access along the transects, UXO avoidance, and radiation monitoring activities. It is anticipated that a limited number (approximately 20 to 40) of hand auger borings will be completed during this field verification task as determined to be necessary by the soil scientist based on the literature review and observed soils conditions in the field. The transects and hand auger borings will be completed in order of importance as determined by the soil scientist to provide field verification in areas determined to be needed. The soil scientist and hydrogeologist, under the direct supervision of the qualified UXO specialist, will complete the hand auger borings. The UXO specialist will complete UXO avoidance screening prior to initiating the borings and downhole during the boring advance in accordance with procedures presented in the HASP Addendum (SAIC 2006). The HPT will provide support for field verification by screening soils returned to the surface with the hand auger and screening the hand auger between boring locations and prior to leaving the site.

The locations of all of the soil borings will be located horizontally using a global positioning system (GPS). In areas where adequate satellite contact can not be acquired (such as under tree cover), the location of the boring will be located by measuring by wheel or tape to the closest GPS located boring.

[1] SAIC will not be completing any UXO clearance activities as part of this investigation. Anomaly avoidance activities using a magnetic locator will be completed by SAIC's Senior UXO Supervisor. The avoidance activities will identify and mark areas where UXO possibly exists and safe work areas where UXO is not present.

The soil characteristics that are specifically able to be identified from hand auger samples include soil texture (USDA classification system); Munsell soil color; soil horizons (layers); and any evidence of redoximorphic features (iron accumulations or depletions), manganese coatings or nodules, or free carbonates (concretions or masses). The determination of soil texture is made in the field by feeling the soil between the fingers to estimate the percentage of sand, silt, and clay fractions. Stickiness, soft and floury, and grittiness are typical field observations of clay, silt, and sand, respectively. Formation of a "ribbon" also indicates relative percentages of sand, silt, and clay. Soil structure is a valuable characteristic, but is usually destroyed during the hand boring excavation. The carbonate concretions or masses (free carbonates) will be verified with a dilute solution of hydrochloric acid (10 percent).

The information will be recorded on a spreadsheet form that includes the following information:

- Site location identifier
- Soil mapping unit/series
- Horizon depths
- Horizon designation
- Munsell color
- Soil Texture
- Redoximorphic features
- Manganese coatings or nodules
- Evidence of free carbonates
- Other information, such as size and abundance of roots and any other pertinent characteristics.

Between boring locations, the hand auger equipment will be decontaminated by dry methods consisting of scraping and removing the loose soil and material clinging to the equipment. The HPT will survey the equipment and additional decontamination will be completed if determined to be radioactive. Additional decontamination, if necessary, will consist of a water and Alconox® wash with a water rinse. All equipment will be surveyed by the HPT for radioactivity prior to demobilizing from the site.

SAIC personnel are required to comply with all of the policies and procedures specified in this FSP Addendum, associated plans (SAIC 2005a, b, and c; SAIC 2006), and other referenced documents. The following summarizes the roles and responsibilities of the SAIC personnel responsible for conducting the soil verification:

- Mr. Joseph N. Skibinski is SAIC's overall JPG Project Manager. He is responsible for all activities conducted at JPG, including the soil verification and all external coordination.
- Mr. Charley L. Klinger is SAIC's Lead Soil Scientist for the soil verification activities. He is responsible for assisting in developing the plans associated with the soil verification task and will be present at JPG during the field verification.
- Mr. Todd D. Eaby is SAIC's Lead Hydrogeologist for the soil verification activities. He is responsible for developing the plans associated with the soil verification task and will be present at JPG during the field verification. While present at JPG, he will be the primary point of contact for SAIC.
- Mr. Seth T. Stephenson will serve as the Field Manager and provide UXO avoidance support. He is a graduate of the EOD School in Indian Head, Maryland, and has served as the UXO Team Member and UXO Supervisor on surveys and removal actions at DOD sites. When Mr. Eaby is not present at JPG, he will be the primary point of contact for SAIC and will be responsible for ensuring work activities are conducted in accordance with the procedures and policies specified in this FSP Addendum and other related project plans.

- Mr. Randy C. Hansen will serve as the Project Health and Safety Officer. He is a certified safety professional (CSP) and has supervised the environmental radiation protection program on remedial action projects involving radiological contamination. He has experience supporting field operations at JPG.
- Mr. Harold W. Anagnostopoulos will serve as the Radiation Safety Officer. He is a certified health physicist (CHP) in SAIC's St. Louis office who specializes in environmental compliance, occupational safety, and radiation protection.
- Mr. Joseph E. Peters will be the Quality Control (QC) Manager for all of SAIC's work at JPG. He will conduct a laboratory surveillance to ensure that project personnel training requirements are properly documented and up to date. He is the QC Manager for USACE, National Guard Bureau (NGB), and U.S. Department of Energy (DOE) contracts and has extensive experience in working with laboratories and validating chemical and radiological data.

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3. INVESTIGATION-DERIVED WASTE

Soil cuttings generated from the hand auger borings will be returned into the open borehole and/or spread on the ground surface at the location of the boring.

Decontamination liquids (if any) will be disposed of on the grounds within the DU Impact Area. This is acceptable as bulk soils will be removed from the equipment and the equipment will be surveyed by a HPT prior to the use of decontamination liquids. Wide-scale use of decontamination fluids is not expected.

Any materials such as disposable personal protective equipment (PPE) and paper towels will be surveyed by a HPT for unrestricted release or placed into plastic bags, labeled as radioactive materials, and stored in an approved radioactive material storage location at JPG (for eventual shipment and disposal by a licensed radioactive waste broker). It is anticipated that all PPE will be able to be released and disposed of as nonradioactive.

If nonradioactive IDW disposal is determined to be necessary, a change order will be requested to include the services of a qualified and experienced IDW subcontractor (i.e., either Onyx or Clean Harbors).

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4. DATA USE

A report will be prepared that summarizes the data collected from field observations. The report will include the information acquired from the published material review. Included in the report will be a map illustrating the locations of transects and the hand auger boring locations, as well as published and observed soil type mapping unit boundaries. The report and revised soil survey map will be used to provide more accurate site-specific soils data to be used in modeling, soil sample investigation planning, and analysis.

Photographs of the individual hand auger borings/locations are not planned and will not be included in the reports because of their limited value. Soil colors depicted in photographs usually are not representative of the colors observed in the field and can be misleading unless taken by a professional. However, photographs may be taken showing the general locations/orientations of the transects that hand auger borings were collected from, along and of significant features, such as breaks in topography, where divisions in soil types occur. Photographs of transects will have hand auger boring locations marked with pin flags.

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5. RADIOLOGICAL RESPONSIBILITY AND LICENSING

The possession of radioactive materials at JPG is authorized and governed under a radioactive materials license granted by NRC to the Army. The license number is SUB-1435. The current amendment is No. 13, dated April 26, 2006. The license authorizes the possession of up to 80,000 kilograms (approximately 177,000 pounds) of DU metal, alloy, and/or other forms. The material must remain onsite, within the restricted area known as the "Depleted Uranium Impact Area."

The Army has requested that SAIC be responsible for the work that is described in this FSP Addendum, and obtain and utilize a license from NRC that authorizes the contractor to provide radiological services for the Army. SAIC has obtained and will utilize such a license.

The SAIC St. Louis office is authorized to provide certain radiological services to clients under a radioactive materials license granted by NRC to SAIC. The license number is 24-32591-01. License condition number 14 requires that SAIC enter into a written agreement with the Army so that roles, responsibilities, and lines of authority for work at the site are clearly defined. This written agreement will be issued in letter form and must be signed by authorized persons from both SAIC and the Army prior to initiating work under this FSP. Once the agreement is signed, Figure 5-1 will be used to document the true date and time that responsibilities are transferred between the Army and SAIC.

Section 1 – Acceptance by SAIC Under NRC License No. 24-32591-01

Form ID No. (MM-DD-YYYY-XX):	
Task Description and Working location (be very specific):	
Governing Work Document(s) (e.g., Field Sampling Plan, HASP Addenda):	
Client Contacted (print name):	Method of Notification:
☐ Check to confirm that the client has agreed to remit the working area(s) to SAIC	
SAIC Approval to Accept	
SAIC Name (print):	Signature:
Date Accepted:	Time Accepted:
Follow-on Client Approval to Remit	
Client Name (print):	Signature:

Section 2 – Remittance by SAIC to the Army Under NRC License No. SUB-1435

Client Contacted (print name):	Method of Notification:
☐ Check to confirm that the client has agreed to accept the working area(s) from SAIC	
SAIC Approval to Remit	
SAIC Name (print):	Signature:
Date Remitted:	Time Remitted:
Follow-on Client Approval to Accept	
Client Name (print):	Signature:

Figure 5-1. Acceptance and Remittance of Radiological Responsibility at JPG

6. REFERENCES

SAIC (Science Applications International Corporation). 2005a. Field Sampling Plan, Site Characterization of the Depleted Uranium Impact Area. Final. May.

SAIC. 2005b. Health and Safety Plan, Site Characterization of the Depleted Uranium Impact Area. Final. May.

SAIC. 2005c. Quality Control Plan, Site Characterization of the Depleted Uranium Impact Area. Final. May.

SAIC. 2006. Health and Safety Plan Addendum: Site Characterization – Soil Verification of the Depleted Uranium Impact Area. Draft. April.

U.S. Army. 2000. Jefferson Proving Ground Firing Range Memorandum of Agreement. Signed on May 11, 2000 by Deputy Assistant Secretary of the Air Force for Installations, 12 May 2000 by the Deputy Assistant Secretary of the Army (Installations and Housing), and 19 May 2000 by the Director of U.S. Fish and Wildlife Services.

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