Non-Time Critical Removal Actions Uranium and Lead Contaminated Soil Report, B-47 Crash Site, Abilene, TX

Prepared by
Sullivan – Arrowhead Federal Services JV
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ACRONYMS AND ABBREVIATIONS

AEC       Atomic Energy Commission
AFB       Air Force Base
AFSC      Air Force Safety Center
Air Force  U.S. Air Force
AOI       Area of Interest
cm        Centimeters
CPM       Counts Per Minute
DOT       Department of Transportation
DU        Depleted Uranium
EDi       Environmental Dimensions, Inc.
FIDLER    Field Instrument for the Detection of Low-Energy Radiation
HE        High Explosives
HEU       Highly Enriched Uranium
MARSSIM   Multi-Agency Radiation Survey and Site Investigation Manual
mR/hour   Millirem Per Hour
P Ci/g    Average Picocuries Per Gram
PCL       Protection Concentration Limit
SPLP      Synthetic Precipitation Leaching Procedure
SSLs      Soil Screening Levels
SU        Survey Unit
SULLIVAN/AFS  Sullivan-Arrowhead Federal Programs JV
TCEQ      Texas Commission of Environmental Quality
TRRP      Texas Risk Reduction Program
USACE     U.S. Army Corps of Engineers
USAFSAM   U.S. Air Force School of Aerospace Medicine
1.0 INTRODUCTION

1.1 Introduction/Site Description

On 4 November 1958, a fire on-board a B-47 taking-off from Dyess AFB, caused a crash located approximately 4.5 miles southwest of the Dyess AFB flight line. The plane was carrying a full load of fuel and one nuclear weapon which caused on impact an explosion of the fuel and conventional high explosives (HE) in the nuclear weapon. The impact site was on private property that at the time was being cultivated for wheat. Within a couple of years after the accident and to present day, the land has supported cattle grazing operations.

Teams from Dyess AFB and the Atomic Energy Commission (AEC) responded to the accident site, and removed aircraft debris and some weapon debris that was not scattered by the HE detonation action. Contaminants dispersed by the detonation included depleted uranium (DU), highly-enriched uranium (HEU), and lead. The amount of these materials in the weapon remains classified.

Response individuals performed radiological measurements on soils with field instruments sensitive to the α-particle emissions from the uranium contaminant. Instrument readings ranged from those typical for background radiological conditions (i.e., that from naturally-occurring radioactive materials in soils) to 100 counts per minute (cpm). The highest readings were located within 100 feet of the crater produced by the HE detonation. The following conclusions were drawn from the recovery action: ground contamination had fairly low concentrations and decontamination was not necessary. These conclusions were based on the fact that the accident occurred in a fairly isolated area, the weapon contained no plutonium, and the force of the explosion apparently dispersed the radioactive material widely.

A team effort by the U.S. Air Force School of Aerospace Medicine (USAFSAM), U.S. Army Corp of Engineers, 7th Civil Engineering Squadron and the Air Force Safety Center (AFSC) conducted a Site Evaluation in winter/spring 2010 to evaluate uranium and lead concentrations in the surface and subsurface soils. Under the Multi-Agency Radiation Survey and Site Investigation Manual (MARSSIM) guidance, the site was divided into 13 Survey Units (SU) and the results of those surveys indicated that small areas within Survey Units 1, and 3 would require soil removal to meet soil screening levels (SSLs) established for the project (USACE et al. 2010). All lead impacted soils were below the Texas Risk Reduction Program (TRRP) protection concentration limit (PCL) of 150 mg/kg.

1.2 Project Description

The purpose of this project was to remove uranium-contaminated soils from areas specified in the Engineering Evaluation/Cost Analysis (USACE and HQ AFSC 2010) and to restore the site to preconstruction conditions. This removal action consisted of mobilizing personnel, equipment and instrumentation to the Dyess AFB crash site to excavate and remove radioactively contaminated soils from three distinct areas: Area of Interest (AOI) 1 within SU 1; AOI 7 within SU 3; and an area encompassed by AOI 2. This data indicated that approximately 20 cubic yards of shallow soils would be removed from the site and transported to an out of state disposal facility licensed to accept the waste.

Once the areas were defined for removal, the remediation construction contractor, Sullivan – Arrowhead Federal Services (SULLIVAN/AFS) and its radiation support contractor,
Environmental Dimensions, Inc. (EDi) began to implement the removal of the contaminated soil. The soil was excavated and subsequently loaded into a waste container and then transported to an offsite disposal facility.

1.3 Remediation Activities

Sullivan/AFS was contracted through the USACE to the Air Force to conduct the soil removal actions and to transport and dispose of the waste at the Abilene, Texas crash site in the vicinity of Dyess AFB. SULLIVAN/AFS contracted to EDi to provide radiological services which included the development of the Field Sampling Plan and to conduct radiation surveys and soil sampling activities (Sullivan-Arrowhead FS 2011).

On August 15, 2011, the Air Force, SULLIVAN/AFS and EDi were deployed to the Dyess crash site and remediation activities began on Tuesday, August 16. SULLIVAN/AFS heavy equipment consisted of a Caterpillar 320 DL tracked excavator and a Caterpillar 279 C skid steer loader. SULLIVAN/AFS provided the operator, labor and supervision for this activity. Waste transportation sub-contractor G&G Transportation provided a tractor and 24 cubic yard end dump to contain contaminated soil.

EDi deployed a Senior Radiation Control Technician and a Radiation Control Supervisor along with radiation detection instrumentation for guiding the excavation and for contamination control as listed below:

1) Ludlum Model 19
2) FIDLER (low energy gamma detector)
3) 44-9 probe (Beta/Gamma detector)
4) L-M2929 Scaler counter with 43-10-1 probe (dual alpha/beta smear counter)
5) 43-5 probe (alpha detector)
6) 2221 Rate Meters (Ratemeter/Scaler for operation with Fiddler and 43-5 detectors)
7) Model 3 (Ratemeter for operation with 44-9 detector)
8) Model 2929 with 43-10-1 Dual Alpha/Beta Sample Counter
9) Th-230 Check source
10) SrY-90 Check source
11) Am-241 Check Source
12) Cs-137 Check Source

FIDLER detectors were coupled to Ludlum 2221 Scaler Rate meters. Alpha and Beta radiation detectors were coupled with rate meters. Daily response checks and background measurements were conducted on all instrumentation used at the Dyess AFB crash site to establish respective responses and to assure consistent performance (Daily Response Checks are found in Appendix B). Background was determined by a minimum of three one minute counts. Source response consisted of pre and post shift measurements of one minute counts of Americium 214, Strontium-Yttrium 90 and Thorium 230 check sources. The Ludlum Model 19 microR Meter was source checked using a Cesium 137 check source.

All equipment and vehicles entering into the excavation areas were surveyed for Alpha and Beta contamination prior to entry into and exit from the site. All other vehicles were excluded from entering the areas near the excavations and were limited to the access road berm and a pre-designated parking area away from the Areas of Interest.
The USAFSAM and the AFSC (Government Field Support Team) performed field surveys using a field instrument for detection of low energy radiation (FIDLER) in the areas planned for excavation and implemented a systematic grid over the potentially impacted areas. The grid spacing in AOI #1 was three feet and the grid spacing in AOI #2 was eight feet. The grid spacing in AOI #2 was greater because the spatial variability in the radiological measurements from the site evaluation was more uniform than AOI #1, and the planned survey area was larger. Greater details on this portion of the field work is contained in Appendix A, as prepared by the HQ AFSC, USAFSAM, and USACE (Omaha District) team.

Prior to excavation activities, the Government Field Support Team conducted in-situ FIDLER surveys and placed pin flags within each AOI to delineate elevated radioactive soil concentrations designated for removal. The initial excavation was planned to remove contaminated soils down to 30 cm (1 foot) in depth. They also set an excavation threshold for removal of soil at a count rate of 13,000 – 15,000 cpm using the FIDLERs. The Government Field Support Team compared their FIDLER background results with EDi’s FIDLER background results and both units were found to be <500 cpm apart.

After the elevated contamination areas within AOI #1 in Survey Unit 1 were delineated, the SULLIVAN/AFS excavator (Caterpillar 320 DL) was moved into the area and began the soil removal activities. EDi personnel used FIDLERs to guide the excavation and Air Force personnel support confirmation that the areas removed met the excavation threshold for the instrumentation. Approximately 7 cubic yards of soil was removed from AOI #1 and placed into the waste transporter’s end dump.

SULLIVAN/AFS proceeded to set up the excavator and skid steer loader at the hot spot within AOI #7; an additional cubic yard of contaminated soil was excavated and placed into the end dump from this area. Some of this area was pre-excavated with a shovel to evaluate the potential for a discrete source of contamination.

SULLIVAN/AFS then set up in AOI #2 and removed an estimated volume of 8 cubic yards of contaminated soil. The G&G Transportation Truck was surveyed for dose rates and radioactive contamination and was found to meet the minimum Department of Transportation (DOT) regulations for release as well as for Regulatory Guide 1.86 for free release. Dose rate surveys were recorded in mR/hr as denoted on the appropriate survey form.

Surveys were performed using a calibrated dose rate survey instruments and measurements were collected on each side of the vehicle on contact with the surface. The highest readings in mR/hr were documented. The survey was conducted using the vertical planes and horizontal (for the top) of the trailer as described in 49 CFR 173.441(b)(3). Surveys also included the top and underside of the vehicle. All contact reading for all sides of the vehicle were not above background. Direct and removable contamination surveys were conducted on various areas of the truck and the results of those surveys met Reg Guide 1.86 for free release. Release survey documents as completed by EDi are contained in Appendix B. The transportation vehicle arrived at the US Ecology waste disposal facility on August 19. A copy of the Certificate of Disposal, manifest, and waste profiling documents are contained in Appendix C.

1.4 Final Status Survey

After the excavations in each AOI were completed, the Government Field Support Team set up a pre-designed (systematic) grid pattern using pin flags for taking static measurements and for
collecting soil samples in the excavated areas. All soil samples were collected from 0-30 cm from the existing surface elevation of the ground, post excavation.

In Survey Unit 1, AOI #1, eight samples were collected from areas with higher count rates and those locations were determined by the Government Field Support Team.

One sample was collected from a random location that was identified to be located in the exposed ponded substrate just north and west of the crash site (towards Dyess AFB). The surface water in the former pond had evaporated due to the existing drought in the area making it accessible for sampling. Five samples were collected in AOI #2. One sample was collected as a biased sample in AOI #7, former hot spot. Four samples were split samples co-located in the same sampling location collected by personnel employed by the Texas Commission on Environmental Quality (TCEQ). These are identified as 5-point composites. All sampling locations as well as a complete evaluation of final site status are contained in Appendix A.

The following Table is the Sampling Log, with reported results for radionuclides identified by γ-spectroscopy analysis and isotopic uranium and subsequent α-spectroscopy analysis. Copies of the Test America Analytical Reports are contained in Appendix D which contains quality control reports.
## Dyess AFB B-47 Soil Samples

### Gamma Spectrometry (pCi/g)

<table>
<thead>
<tr>
<th>Sample ID</th>
<th>Collected</th>
<th>Th-232</th>
<th>Ra-226</th>
<th>U-235</th>
</tr>
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<tbody>
<tr>
<td>S1-SS-6N9E</td>
<td>8/17/11</td>
<td>0.86±0.38</td>
<td>0.65±0.22</td>
<td>1.23±0.38</td>
</tr>
<tr>
<td>S1-SS-6N27E</td>
<td>8/17/11</td>
<td>0.91±0.38</td>
<td>0.80±0.25</td>
<td>3.73±0.65</td>
</tr>
<tr>
<td>S1-SS-12N15E</td>
<td>8/17/11</td>
<td>0.83±0.31</td>
<td>0.45±0.18</td>
<td>1.47±0.36</td>
</tr>
<tr>
<td>S1-SS-12N21E</td>
<td>8/17/11</td>
<td>0.79±0.36</td>
<td>0.62±0.23</td>
<td>1.67±0.51</td>
</tr>
<tr>
<td>S1-SS-12N27E</td>
<td>8/17/11</td>
<td>0.92±0.41</td>
<td>0.78±0.25</td>
<td>0.61±0.32</td>
</tr>
<tr>
<td>S1-SS-12N9E</td>
<td>8/17/11</td>
<td>1.03±0.41</td>
<td>0.67±0.24</td>
<td>1.76±0.45</td>
</tr>
<tr>
<td>S1-SS-18N9E</td>
<td>8/17/11</td>
<td>0.88±0.40</td>
<td>0.64±0.24</td>
<td>3.77±0.64</td>
</tr>
<tr>
<td>S1-SS-18N18E</td>
<td>8/17/11</td>
<td>0.70±0.33</td>
<td>0.64±0.23</td>
<td>2.76±0.57</td>
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<tr>
<td>S5-SS-POND</td>
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<td>1.41±0.53</td>
<td>0.72±0.25</td>
<td>ND</td>
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<td>S4-SS-8N32E</td>
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<td>S4-SS-32N40E</td>
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<td>0.65±0.28</td>
<td>7.7±1.0</td>
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<td>0.92±0.42</td>
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<td>S8-SS-AOI-7</td>
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</tr>
<tr>
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<td>1.03±0.42</td>
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<td>S4/7-SS-General AOI</td>
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<td>0.47±0.20</td>
<td>1.24±0.38</td>
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</table>

### Alpha Spectrometry (pCi/g)

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<tr>
<th>Sample ID</th>
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<th>U-234</th>
<th>U-235/6</th>
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</thead>
<tbody>
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<td>S1-SS-6N9E</td>
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<td>1.04±0.22</td>
<td>22.6±2.1</td>
<td>0.96±0.23</td>
</tr>
<tr>
<td>S1-SS-6N27E</td>
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<td>1.15±0.24</td>
<td>81.2±7.1</td>
<td>2.82±0.44</td>
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<td>S1-SS-12N15E</td>
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<td>38.4±3.5</td>
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<td>S1-SS-12N21E</td>
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<td>41.1±3.7</td>
<td>1.53±0.32</td>
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<td>S1-SS-12N27E</td>
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<td>0.55±0.16</td>
<td>11.3±1.2</td>
<td>0.40±0.15</td>
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<td>S1-SS-12N9E</td>
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<td>37.5±3.4</td>
<td>1.21±0.26</td>
</tr>
<tr>
<td>S1-SS-18N9E</td>
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<td>1.77±0.31</td>
<td>77.9±6.8</td>
<td>3.08±0.48</td>
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<td>S1-SS-18N18E</td>
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<td>1.33±0.26</td>
<td>60.1±5.3</td>
<td>2.25±0.39</td>
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<tr>
<td>S5-SS-POND</td>
<td>8/17/11</td>
<td>0.72±0.18</td>
<td>0.65±0.17</td>
<td>&lt;0.055 (U)</td>
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<tr>
<td>S4-SS-8N32E</td>
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<td>1.55±0.30</td>
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<tr>
<td>S4-SS-32N40E</td>
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<td>S8-SS-AOI-7</td>
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<tr>
<td>S4/7-SS-General AOI</td>
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<td>1.00±0.22</td>
<td>20.5±1.9</td>
<td>0.86±0.22</td>
</tr>
</tbody>
</table>
2.0 SITE RESTORATION.

On August 18, a locally-procured subcontractor to SULLIVAN/AFS brought in clean fill top soil to the site from a local borrow site approximately 9 miles southwest of the B-47 Crash site. All excavated areas were back-filled with clean soil, and the areas were seeded with grass. Field activities were completed without any equipment failures, on the projected schedule, and without any injuries or incident. Daily quality control reports are contained in Appendix E.

3.0 CONCLUSION AND RECOMMENDATIONS.

The objectives of the Removal Actions were met, with field activities being completed on schedule and without incident.

4.0 REFERENCES


US Army Corp of Engineers (Omaha District) and HQ Air Force Safety Center, “Engineering Evaluation/Cost Analysis, B-47 Crash Site, Dyess AFB, TX,” 3 November 2010.

US Army Corp of Engineers (Omaha District), HQ Air Force Safety Center, USAF School of Aerospace Medicine, HQ ACC, 7th Civil Engineering Squadron, “Site Evaluation Report, B-47 Crash Site, Dyess AFB, TX,” 1 November 2010.
APPENDIX A

FINAL STATUS OF SITE
(COMPLETED BY THE AIR FORCE)
APPENDIX B
RELEASE SURVEY DOCUMENTS
## WEEKLY FIELD SOURCE CHECK LOG

**Site Name:** Dyess Air Force Base  
**Week Ending:** 8/21/11  
**Bkg. Location:** 5.76

**Scaler/Ratemeter:** L-2221  
**Serial #:** 99466  
**Cal. Date:** 8/11/11  
**Cal. Due:** 8/11/12

<table>
<thead>
<tr>
<th>DATE</th>
<th>SOURCE</th>
<th>SERIAL #</th>
<th>SOURCE ACTIVITY (Bq/m²)</th>
<th>SOURCE CHECK cpm (A)</th>
<th>BKG. cpm (B)</th>
<th>CAL EFF/ RESPONSE (%)</th>
<th>DAILY CALCULATED EFF. (%)</th>
<th>HY</th>
<th>BATT.</th>
<th>SPKR</th>
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<td>8-16-11</td>
<td>Th-230</td>
<td>83494</td>
<td>25000</td>
<td>3613</td>
<td>40</td>
<td>14.45 %</td>
<td>14.4 %</td>
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<td>14.3 %</td>
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</tr>
</tbody>
</table>

### Comments:

- +20% of Calibrated Value:
- Value

### Daily Calculated Efficiency:

\[
\frac{(A) - (B)}{(A) - (D)}
\]

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### WEEKLY FIELD SOURCE CHECK LOG

**Site Name:** Dress A & B  
**Week Ending:** 8/21/11  
**Bkg. Location:** S-20

**Scaler/Ratemeter:** L-2221  
**Serial #:** 86308  
**Cal. Date:** 8/11/11  
**Cal. Due:** 8/11/12

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<tr>
<th>Detector</th>
<th>Serial #</th>
<th>Cal. Date</th>
<th>Cal. Due</th>
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</thead>
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<th>TIME</th>
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<th>SERIAL #</th>
<th>SOURCE ACTIVITY</th>
<th>SOURCE CHECK (cpm (A))</th>
<th>BKG CHECK (cpm (B))</th>
<th>CAL EFF RESPONSE (C)</th>
<th>DAILY CALC Eff (D)</th>
<th>HV</th>
<th>BATT</th>
<th>SPKR</th>
<th>DISP</th>
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**Notes:**

- **+ Value:** Daily Calculated Efficiency: \[ \frac{(A)-(D)}{D} \]
- **- Value:**

**Comments:**
**Weekly Field Source Check Log**

**Site Name:** Dyer AFB  
**Week Ending:** 8/21/1  
**Bkg Location:**  
**Scaler/Ratemeter:** Model -3  
**Serial #:** 205884  
**Cal. Date:** 8/11/11  
**Cal. Due:** 8/12/11

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<th>DATE</th>
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<th>SOURCE CHECK (A)</th>
<th>BKG (B)</th>
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<th>DAILY CALCULATED EFF (D)</th>
<th>HV</th>
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<th>SFER</th>
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<td>22.0 %</td>
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+ 20% of Calibrated Value:  
- 20% of Calibrated Value:  

**Daily Calculated Efficiency:** \( \frac{(A)-(B)}{A} \times 100\% \)

**Comments:**

Page 6 of 7

386
### WEEKLY FIELD SOURCE CHECK LOG

**Site Name**: Dyess AFB  
**Day Ending**: 8/21/11  
**Bkg. Location**: Site

**Scaler/Ratemeter**: L-2929  
**Serial #**: 182584  
**Cal. Date**: 7/28/11  
**Cal. Due**: 7/28/12

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± 20% of Calibrated Value:

- Value

Daily Calculated Efficiency: 

\[
\frac{(A) - (B)}{Activity} = (D)
\]

Comments:

Page 6 of 7
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<th>Distance</th>
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<td>620</td>
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5 min bkg. = 2 c/s, 0.4 cpm

5 min source = 18,264 cts, 3613 cpm

Source: Th 230, 75,000 cpm

Eff = 14.45%
## Radiological Survey Report

**Project:** Dyess AFB

**Location/Purpose:** G&G Transport Truck Survey - Incoming

### Instrument Data

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<th>SN.</th>
<th>Probe</th>
<th>SN.</th>
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### Soil Bag Transport Truck

#### Pre Load

#### Post Load

### Transferable (DPM/100cm²)

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<th>Description</th>
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<th>DPM</th>
<th>Gross β</th>
<th>DPM</th>
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<th>βR/hr</th>
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<td>17</td>
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<td>5</td>
<td>46</td>
<td>-7</td>
<td>8</td>
<td>0.008</td>
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<td>Bed Rear Left</td>
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<td>8</td>
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<tr>
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<td>51</td>
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<td>8</td>
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<td>5</td>
<td>Bed Center Right</td>
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<td>1</td>
<td>50</td>
<td>5</td>
<td>8</td>
<td>0.008</td>
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<td>Bed Front Right</td>
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<td>1</td>
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<td>-17</td>
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<td>Trailer Front</td>
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<td>NA</td>
<td>NA</td>
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<td>NA</td>
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<td>NA</td>
<td>NA</td>
<td>NA</td>
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L2529 MDA α= 21 MDA β= 62

**Comments:** NA

**Signature:** review:
Edi RADIOLOGICAL SURVEY

PROJECT: Dyess AFB
Abilene, TX

DATE/TIME: 8/16/11
TECH: Scott Balne
LOCATION/PURPOSE: G&G TRANSPORT TRUCK SURVEY Outgoing
SURVEY#: 201
TRAILER#: ID L1982

INSTRUMENT | SN. | PROBE | SN. | BKGD α | BKGD β | EFF α | EFF β | DATE | DUE |
--- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
L 2229 | 182584 | 43-10-1 | 185401 | 0.8 | 46 | 0.275 | 0.422 | 7/23/2011 | 7/22/2012 |
MODEL 19 | 214399 | NA | NA | NA | 8 μR/hr | NA | NA | 6/10/2011 | 6/9/2012 |
BKG Count time | 60 | NA | NA | NA | NA | NA | NA | NA | NA |
Smear Count Time | 1 | NA | NA | NA | NA | NA | NA | NA | NA |

SOIL BAG TRANSPORT TRUCK

PRE LOAD

POST LOAD

TRANSFERABLE (DPM/100cm²)

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<th>DPM</th>
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DOSE RATE AT 2 METERS

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L2229 MDA α= 22 MDA β= 60 COMMENTS: NA

Signature: review: NA

NTCRA Uranium and Lead Contaminated Soils Report, B-47 Crash Site, Abilene, TX
### Attachment 3

**Form 6.11**

**VEHICLE SURVEY FORM**

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<th>Date</th>
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**Dose Rate Data**

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<td>βγ</td>
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<th>Big Count Time</th>
<th>Big CPM</th>
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## Attachment 3
### Form 6.11
#### VEHICLE SURVEY FORM

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<td>bg/100cm²</td>
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<tr>
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<td>Sample DPM</td>
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### Dose Rate Data

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<td>4</td>
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<td>Big Count Time</td>
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<td>Big CPM</td>
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Page 10 of 11   3A.4
## VEHICLE SURVEY FORM

### Attachment 3

**Form 6.11**

**Outgoing Direct Read Survey**

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### Dose Rate Data

- **Model**: Scaler Model
- **Cal Dos**: Serial #
- **@ Cost @ 30cm**: Cal Dos

### Survey Instrument Data

- **Measurement**: Probe Model
- **Cal Dos**: Serial #
- **Efficiency**: Cal Dos
- **Big Counts**: Big Count Time
- **Big CPM**: Big Count Time
- **Aren Cerr. Factor**: MDA
- **Sample Count Time**: MDA

---

Page 10 of 11
### VEHICLE SURVEY FORM

**CAT 279C**  
**SKID STEER**  
**# MBT - 1541**  
**Incoming Direct Rad Survey**

**Attachment 3**  
**Form 6.11**

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**Dose Rate Data**  
**Survey Instrument Data**  
**Direct**  
**Removable**

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<td>@ Close</td>
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APPENDIX C
CERTIFICATE OF DISPOSAL, MANIFEST, AND WASTE PROFILING DOCUMENT
CERTIFICATE OF DISPOSAL

August 22, 2011

DYESS AFB TX AIR COMBAT COMMAND USAF
LAT. 32.364325 LONG. -99.85225 (WGS84)
BARKELEY, TX 79607

This is to certify that waste as defined on Waste Manifest number 26400 was received by U.S. Ecology, Inc., on 8/19/2011. The waste(s) were subsequently treated, if required by 40 CFR Part 26 and U.S. Ecology’s permits and disposed of by 08/19/2011 in accordance with permits and laws regulating this facility.

Reference Number: 11061908927-26400-1-1
Material: 1 DUMP TRUCK
Process: Direct Landfill

Management Code:
Facility: U.S. ECOLOGY IDAHO, INC.
20400 LEMLEY ROAD
GRAND VIEW, ID 83624
EPA ID: ID073114654

Waste Type: NON HAZARDOUS WASTE
Customer: ARROWHEAD CONTRACTING

Printed Name: DONNA PULLEN

Signature: [Signature]
Title: RECEIVING SUPERVISOR
<table>
<thead>
<tr>
<th>No.</th>
<th>Type</th>
<th>Quantity</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>Bulk</td>
<td>15 cy</td>
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1. Radioactive material, Low specific activity (LSA-I) Fissile-excepted

13. Special Handling Instructions and Additional Information

UN 2912

14. GENERATOR'S CERTIFICATION: I certify the materials described above on this manifest are not subject to federal regulations for reporting proper disposal of Hazardous Waste.

Signature: Steven R. Rademacher

Port of entry/exit: Date leaving U.S.:

15. International Shipment: Import to U.S. Export from U.S.

16. Transporter Acknowledgment of Receipt of Materials

Transporter 1: GAM MILLER

Transporter 2: 

17. Discrepancy

17a. Alternate Facility (or Generator)

Facility's Phone: 

17c. Signature of Alternate Facility (or Generator)
A. CUSTOMER INFORMATION

- **Waste as shipped will be:**
  - ☑ Industrial
  - ☐ NON - Industrial
  - *(Texas customers only)*

Generator: Dyess AFB, TX, Air Combat Command, USAF
Facility Address: Former Camp Berkeley, Texas
Lat. 32.364325 Long. -99.85225 (WGS84)
Mailing Address: 7th CES/CEAN, 710 Third Street
City/State/Zip: Dyess AFB, TX, 79067
Technical Contact: Dr. Steven E. Rademacher (Air Force Safety Center)
Phone: (505) 846-0428 Fax: 928110
NAICS# 928110 CESQQ SQG LQG EPA ID# N/A
Billing Contact: Mr. Josh Phillips

B. SHIPPING INFORMATION

- US DOT Shipping Name: Radioactive material, low specific activity (LSA-I), fissile-excepted
- UN/NA #: UN 2912
- Container Type: ☑ Bulk ☑ Totes ☑ Pallet Size:
- 1. Hazard Class: 7
- 2. UN/NA #: UN 2912
- 3. RQ: Below 100 mCi, Reportable Quantity Limit
- 4. Packagin Group: IP-1
- 5. Quantity: 15 cubic yds

C. GENERAL MATERIAL & REGULATORY INFORMATION

1. Common name for this waste: soil contaminated with dispersed uranium solids
2. Process generating the material: nuclear weapon accident residues dispersed in surface soil
3. Describe physical appearance of waste: brownish-red soil
4. Describe odor of waste: ☑ None ☑ Slight ☑ Strong
5. Knowledge is from: ☑ Lab Analysis ☑ MSDS ☑ Process/Generator knowledge
   ☑ Yes ☑ No Is the waste restricted under EPA Land Disposal Restrictions (40 CFR 268)?
   If yes, please complete LDR form
6. ☑ Yes ☑ No Is the waste, or generating facility, subject to regulation under 40 CFR Part 61 Subpart FF (Benzene Rule) of NESHAPS?
7. Has the waste been treated after the initial point of generation?
   □ Yes ☑ No Subpart XX (40 CFR 63.1080) Controls Required?
8. □ Yes ☑ No Consists of UHCS/Consids of Concern: List in section D
9. ☑ Yes ☑ No EPA Haz. Waste (list codes)
10. ☑ Yes ☑ No Cercla Regulated (Superfund) Waste
11. ☑ Yes ☑ No State waste codes

D. MATERIAL COMPOSITION (Physical/Chemical)

<table>
<thead>
<tr>
<th>Element</th>
<th>(Range Total &gt; or = 100%) Values are</th>
<th>%</th>
<th>Unit range</th>
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<tbody>
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<td>11.5 pCi/g</td>
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<tr>
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E. Does the waste exhibit or contain the following:

- Yes ☑ No Oxidizer
- Yes ☑ No React. Sulfides ppm
- Yes ☑ No Explosive
- Yes ☑ No React. Cyanides ppm
- Yes ☑ No Organic Peroxide
- Yes ☑ No Water/Air (Pyrophoric) React.
- Yes ☑ No Shock Sensitive
- Yes ☑ No Thermally Unstable
- Yes ☑ No Tires
- Yes ☑ No No Tires
- Yes ☑ No No Tires
- Yes ☑ No No Tires
- Yes ☑ No No Tires
- Yes ☑ No Pyrophoric
- Yes ☑ No No Pyrophoric
- Yes ☑ No No Pyrophoric
- Yes ☑ No Compressed Gasses
- Yes ☑ No No Compressed Gasses
- Yes ☑ No Radioactive**
- Yes ☑ No Halogenated Organic Compounds? (per 40 CFR 268, Appendix III)
- Yes ☑ No Exempt RAD**
- Yes ☑ No Additional Radioligical info is provided in USEC's WAC Addendum

F. PHYSICAL CHARACTERISTICS

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<tr>
<th>Property</th>
<th>Specification</th>
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</thead>
<tbody>
<tr>
<td>pH Range</td>
<td>7 ☑ 8, &lt;12.50</td>
</tr>
<tr>
<td>1. Flash Point</td>
<td>°F (if &lt;140°F)</td>
</tr>
<tr>
<td>2. Typical pH</td>
<td>7</td>
</tr>
<tr>
<td>3. Possibility of incidental liquid from transportation?</td>
<td>☑ Yes, ☑ No</td>
</tr>
<tr>
<td>4. Does waste pass the EPA specified paint filter test?</td>
<td>☑ Yes, ☑ No</td>
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</tbody>
</table>

G. GENERATOR'S CERTIFICATION:

- Yes ☑ No I certify this material may be disposed of without further treatment.

Certification Statement: I certify under penalty of law that I am familiar with this waste stream through analysis and/or process knowledge, and that all information provided is true, accurate, representative and complete, and that all known or suspected hazards have been disclosed. Furthermore, I certify that this form was completed in accordance with the instructions provided.

Print Name: Dr. Steven E. Rademacher
Title: Chief Radioact. Mat. Peri/Licen
Date: 30 March 2011
APPENDIX D
LAB RESULTS FOR SOIL ANALYSES AND SPLP
ANALYTICAL REPORT

PROJECT NO. DYESS USAF

B-47 Crash Site
Lot #: F1H200427

Josh Phillips
Arrowhead Contracting, Inc
10981 Eicher Drive
Lenexa, KS 66219

TESTAMERICA LABORATORIES, INC.

[Signature]

Michael C. Franks
Project Manager

September 9, 2011
Case Narrative  
LOT NUMBER: F1H200427  

This report contains the analytical results for the 20 samples received under chain of custody by TestAmerica St. Louis on August 19, 2011. These samples are associated with your B-47 Crash Site project.

The analytical results included in this report meet all applicable quality control procedure requirements.

The test results in this report meet all NELAP requirements for parameters in which accreditations are held by TestAmerica St. Louis. Any exceptions to NELAP requirements are noted in the case narrative. TestAmerica St. Louis' Florida certification number is E87689. The case narrative is an integral part of this report.

This report shall not be reproduced, except in full, without the written approval of the laboratory.

All chemical analysis results are based upon sample as received, wet weight, unless noted otherwise. All radiochemistry results are based upon sample as dried and ground with the exception of tritium, unless requested wet weight by the client.

Observations/Nonconformances  
Reference the chain of custody and condition upon receipt report for any variations on receipt conditions and temperature of samples on receipt.

There are no observations or non-conformances associated with the analyses contained in this report.
# Method Summary

Client: Arrowhead Contracting, Inc  
Project/Site: DYESS USAF  

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<thead>
<tr>
<th>Method</th>
<th>Method Description</th>
<th>Protocol</th>
<th>Laboratory</th>
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<td>Gamma Cs-137 &amp; Hts by EPA 901.1 MOD</td>
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<td>TAL SL</td>
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<td>Iso URANIUM (SHORT CT) DOE A-01-R MOD</td>
<td>EML</td>
<td>TAL SL</td>
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**Protocol References:**
- EPA = US Environmental Protection Agency

**Laboratory References:**
- TAL SL = TestAmerica St. Louis, 13715 Rider Trail North, Earth City, MO 63045, TEL (314)298-8566
## Sample Summary

**Client:** Arrowhead Contracting, Inc  
**Project/Site:** DYESS USAF  
**TestAmerica Job ID:** F1H200427

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### Client Sample Results

**Client:** Arrowhead Contracting, Inc  
**Project/Site:** DYES USAF  
**Client Sample ID:** S1-SS-6N9E  
**Date Collected:** 08/17/11 15:10  
**Date Received:** 08/19/11 06:50

**Method:** 901.1 MOD - Gamma Cs-137 & Hits by EPA 901.1 MOD

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<th>Total Uncertainty (2σ+)</th>
<th>MDC</th>
<th>Unit</th>
<th>Prepared</th>
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<td>0.16</td>
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<tr>
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<td>pCi/g</td>
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**Method:** A-01-R MOD - Iso URANIUM (SHORT CT) DOE A-01-R MOD

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<th>Unit</th>
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**Client Sample ID:** S1-SS-6N27E  
**Date Collected:** 08/17/11 15:25  
**Date Received:** 08/19/11 06:50

**Method:** 901.1 MOD - Gamma Cs-137 & Hits by EPA 901.1 MOD

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<th>Unit</th>
<th>Prepared</th>
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**Method:** A-01-R MOD - Iso URANIUM (SHORT CT) DOE A-01-R MOD

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Client Sample Results

Client: Arrowhead Contracting, Inc
Project/Site: DYE SS USAF

Client Sample ID: S1-SS-6N27E
Date Collected: 08/17/11 15:25
Date Received: 08/19/11 06:50

Lab Sample ID: F1H200427002
Matrix: Solid

Method: A-01-R MOD - Iso URANIUM (SHORT CT) DOE A-01-R MOD (Continued)

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Date Collected: 08/17/11 15:40
Date Received: 08/19/11 06:50

Lab Sample ID: F1H200427003
Matrix: Solid

Method: 901.1 MOD - Gamma Cs-137 & Hits by EPA 901.1 MOD

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<th>MDC</th>
<th>Unit</th>
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Method: A-01-R MOD - Iso URANIUM (SHORT CT) DOE A-01-R MOD

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<th>Qualifier</th>
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<th>Total Uncertainty (2σ±)</th>
<th>MDC</th>
<th>Unit</th>
<th>Prepared</th>
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<th>Dil Fac</th>
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</thead>
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<td>Uranium 238</td>
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Client Sample ID: S1-SS-12N21E
Date Collected: 08/17/11 15:45
Date Received: 08/19/11 06:50

Lab Sample ID: F1H200427004
Matrix: Solid

Method: 901.1 MOD - Gamma Cs-137 & Hits by EPA 901.1 MOD
### Client Sample Results

**Client Sample ID:** S1-SS-12N21E  
**Date Collected:** 08/17/11 15:45  
**Date Received:** 08/19/11 06:50

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<th>Unit</th>
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**Method:** A-01-R MOD - Iso URANIUM (SHORT CT) DOE A-01-R MOD

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### Client Sample Results

**Client Sample ID:** S1-SS-12N15E  
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**Date Received:** 08/19/11 08:50

**Method:** 901.1 MOD - Gamma Co-137 & Hits by EPA 901.1 MOD

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**Other Detected Radionuclides**

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**Method:** A-01-R MOD - Iso URANIUM (SHORT CT) DOE A-01-R MOD

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## Client Sample Results

**Client:** Arrowhead Contracting, Inc  
**Project/Site:** DYESS USAF

### Client Sample ID: S1-SS-12N9E

**Date Collected:** 08/17/11 15:55  
**Date Received:** 08/19/11 06:50

#### Method: 901.1 MOD - Gamma Cs-137 & Hits by EPA 901.1 MOD

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#### Other Detected Radionuclides

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### Method: A-01-R MOD - Iso URANIUM (SHORT CT) DOE A-01-R MOD

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### Client Sample ID: S1-SS-18N9E

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#### Other Detected Radionuclides

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### Method: A-01-R MOD - Iso URANIUM (SHORT CT) DOE A-01-R MOD

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Lot# F1H200427  
8 of 23
Client Sample Results

Client: Arrowhead Contracting, Inc
Project/Site: DYESS USAF

Client Sample ID: S1-SS-13N9E
Date Collected: 08/17/11 16:00
Date Received: 08/19/11 06:50

Lab Sample ID: F1H200427007
Matrix: Solid

Method: A-01-R MOD - Iso URANIUM (SHORT CT) DOE A-01-R MOD (Continued)

<table>
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<th>Uncertainty (2σ+/-)</th>
<th>Uncertainty (2σ+/-)</th>
<th>MDC</th>
<th>Unit</th>
<th>Prepared</th>
<th>Analyzed</th>
<th>Dil Fac</th>
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<tbody>
<tr>
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<tr>
<td>Uranium 238/236</td>
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<td>09/01/11</td>
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<td>% Yield</td>
<td>Qualifier</td>
<td>Limits</td>
<td></td>
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<td>06:21</td>
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<td>Uranium-232</td>
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Client Sample ID: S1-SS-18N-18E
Date Collected: 08/17/11 16:05
Date Received: 08/19/11 06:50

Lab Sample ID: F1H200427008
Matrix: Solid

Method: 901.1 MOD - Gamma Cs-137 & Hits by EPA 901.1 MOD

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<th>Prepared</th>
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<td>Bismuth 214</td>
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<td>22:27</td>
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<td>Lead 212</td>
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<td>pCi/g</td>
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<td>pCi/g</td>
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<td>22:27</td>
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<td>Potassium 40</td>
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<td>Thallium 208</td>
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Method: A-01-R MOD - Iso URANIUM (SHORT CT) DOE A-01-R MOD

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<th>Uncertainty (2σ+/-)</th>
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<th>Unit</th>
<th>Prepared</th>
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<td>0.26</td>
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<td>Qualifier</td>
<td>Limits</td>
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<td>06:21</td>
<td>1</td>
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Client Sample ID: S5-SS-POND
Date Collected: 08/17/11 16:10
Date Received: 08/19/11 06:50

Lab Sample ID: F1H200427009
Matrix: Solid

Method: 901.1 MOD - Gamma Cs-137 & Hits by EPA 901.1 MOD

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<th>Dil Fac</th>
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TestAmerica St. Louis
Client Sample Results

Client: Arrowhead Contracting, Inc
Project/Site: DYESS USAF
Client Sample ID: S5-SS-POND
Date Collected: 08/17/11 16:10
Date Received: 08/19/11 06:50

Lab Sample ID: F1H200427009
Matrix: Solid

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### Method: A-01-R MOD - Iso URANIUM (SHORT CT) DOE A-01-R MOD

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<th>Total Uncertainty (2σ+/-)</th>
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<th>Unit</th>
<th>Prepared</th>
<th>Analyzed</th>
<th>Dil Fac</th>
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</thead>
<tbody>
<tr>
<td>Uranium 234</td>
<td>0.65</td>
<td></td>
<td>0.16</td>
<td>0.17</td>
<td>0.05</td>
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<tr>
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<td>09/01/11 06:00</td>
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### Method: 901.1 MOD - Gamma Cs-137 & Hits by EPA 901.1 MOD

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<th>Unit</th>
<th>Prepared</th>
<th>Analyzed</th>
<th>Dil Fac</th>
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### Method: A-01-R MOD - Iso URANIUM (SHORT CT) DOE A-01-R MOD

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<th>Total Uncertainty (2σ+/-)</th>
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<th>Unit</th>
<th>Prepared</th>
<th>Analyzed</th>
<th>Dil Fac</th>
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<td>1.1</td>
<td>3.0</td>
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<td>09/09/11 06:21</td>
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<td>0.19</td>
<td>0.02</td>
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## Client Sample Results

**Client Sample ID:** S4-SS-16N-40E  
**Date Collected:** 08/17/11 16:20  
**Date Received:** 08/19/11 06:50

### Method: 901.1 MOD - Gamma Cs-137 & Hits by EPA 901.1 MOD

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<th>Total Uncertainty (2σ/%)</th>
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<th>Unit</th>
<th>Prepared</th>
<th>Analyzed</th>
<th>Dil Fac</th>
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<tr>
<td>Actinium 228</td>
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<tr>
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<td>0.16</td>
<td>pCi/g</td>
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<td>08/24/11 00:00</td>
<td>08/24/11 22:58</td>
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<td>Potassium 40</td>
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<tr>
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### Method: A-01-R MOD - Iso URANIUM (SHORT CT) DOE A-01-R MOD

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<tr>
<td>Uranium 238</td>
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<td>0.28</td>
<td>0.33</td>
<td>0.03</td>
<td>pCi/g</td>
<td>08/01/11 00:00</td>
<td>08/01/11 00:00</td>
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<td>Uranium-232</td>
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**Client Sample ID:** S4-SS-32N-40E  
**Date Collected:** 08/17/11 16:25  
**Date Received:** 08/19/11 06:50

### Method: 901.1 MOD - Gamma Cs-137 & Hits by EPA 901.1 MOD

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<th>Total Uncertainty (2σ/%)</th>
<th>MDC</th>
<th>Unit</th>
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<td>0.14</td>
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<td>pCi/g</td>
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### Method: A-01-R MOD - Iso URANIUM (SHORT CT) DOE A-01-R MOD

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TestAmerica St. Louis

Lot# F1H200427  
11 of 23
### Method: A-01-R MOD - Iso URANIUM (SHORT CT) DOE A-01-R MOD (Continued)

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<th>Unit</th>
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### Method: 901.1 MOD - Gamma Cs-137 & Hits by EPA 901.1 MOD

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### Method: A-01-R MOD - Iso URANIUM (SHORT CT) DOE A-01-R MOD

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### Method: 901.1 MOD - Gamma Cs-137 & Hits by EPA 901.1 MOD

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# Client Sample Results

**Client:** Arrowhead Contracting, Inc  
**Project/Site:** DYESS USAF  
**Client Sample ID:** S4-SS-32N-56E  
**Lab Sample ID:** F1H200427014  
**Matrix:** Solid  
**Date Collected:** 08/17/11 16:35  
**Date Received:** 08/19/11 06:50

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### Method: A-01-R MOD - Iso URANIUM (SHORT CT) DOE A-01-R MOD

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### Client Sample ID: S4-SS-24N-56E

**Lab Sample ID:** F1H200427015  
**Matrix:** Solid  
**Date Collected:** 08/17/11 16:40  
**Date Received:** 08/19/11 06:50

### Method: 901.1 MOD - Gamma Cs-137 & HITS by EPA 901.1 MOD

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### Other Detected Radionuclides

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<th>Unit</th>
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<th>Analyzed</th>
<th>Dil Fac</th>
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### Method: A-01-R MOD - Iso URANIUM (SHORT CT) DOE A-01-R MOD

<table>
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Lot# F1H200427  
13 of 23
### Client Sample Results

**Client: Arrowhead Contracting, Inc**  
**Project/ Site:** DYESS USAF  
**Client Sample ID:** S8-SS-AOI-7  
**Date Collected:** 08/17/11 16:45  
**Date Received:** 08/19/11 06:50  
**Lab Sample ID:** F1H200427016  
**Matrix:** Solid

#### Method: 901.1 MOD - Gamma Ca-137 & Hits by EPA 901.1 MOD

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#### Method: A-01-R MOD - Iso URANIUM (SHORT CT) DOE A-01-R MOD

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**Client Sample ID:** S4-SS-AOI-2  
**Date Collected:** 08/17/11 17:00  
**Date Received:** 08/19/11 06:50  
**Lab Sample ID:** F1H200427017  
**Matrix:** Solid

#### Method: 901.1 MOD - Gamma Ca-137 & Hits by EPA 901.1 MOD

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<th>Unit</th>
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#### Method: A-01-R MOD - Iso URANIUM (SHORT CT) DOE A-01-R MOD

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Lot# F1H200427  
14 of 23
### Method: A-01-R MOD - Iso URANIUM (SHORT CT) DOE A-01-R MOD (Continued)

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<td>Uranium 238/236</td>
<td>3.84</td>
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### Method: 901.1 MOD - Gamma Cs-137 & Hits by EPA 901.1 MOD

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### Other Detected Radionuclides

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<td>Potassium 40</td>
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<td>1.7</td>
<td>0.9</td>
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<td>Thallium 208</td>
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### Method: A-01-R MOD - Iso URANIUM (SHORT CT) DOE A-01-R MOD

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### Method: 901.1 MOD - Gamma Cs-137 & Hits by EPA 901.1 MOD

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# Client Sample Results

**Client:** Arrowhead Contracting, Inc  
**Project/Site:** DYES USAF

**Client Sample ID:** S1-SS-AOI-1  
**Date Collected:** 08/18/11 09:45  
**Date Received:** 08/19/11 06:50

### Method: A-01-R MOD - Iso URANIUM (SHORT CT) DOE A-01-R MOD

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### Method: 901.1 MOD - Gamma Cs-137 & Hits by EPA 901.1 MOD

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### Other Detected Radionuclides

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<td>Bismuth 214</td>
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<td>Thallium 208</td>
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**Lot# F1H200427**  
**TestAmerica St. Louis**  
**16 of 23**
Client Sample Results

Client: Arrowhead Contracting, Inc
Project/Site: DYESS USAF

Client Sample ID: S4/7-SS-GENERAL AOI
Date Collected: 08/18/11 10:45
Date Received: 08/19/11 06:50

Lab Sample ID: F1H200427020
Matrix: Solid

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TestAmerica St. Louis
Lot# F1H200427
## QC Sample Results

**Method:** 901.1 MOD - Gamma Cs-137 & Hits by EPA 901.1 MOD

### Lab Sample ID: F1H240000129B
**Matrix:** Solid  
**Analysis Batch:** 1236129

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**Matrix:** Solid  
**Analysis Batch:** 1236129

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**Matrix:** Solid  
**Analysis Batch:** 1236129

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### Method: A-01-R MOD - Iso URANIUM (SHORT CT) DOE A-01-R MOD

### Lab Sample ID: F1I010000053B
**Matrix:** Solid  
**Analysis Batch:** 1244053

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**Analysis Batch:** 1244053

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**Prep Type:** Total  
**Prep Batch:** 1236129_P

### Client Sample ID: Lab Control Sample
**Prep Type:** Total  
**Prep Batch:** 1236129_P

### Client Sample ID: S1-SS-6N8E DUP
**Prep Type:** Total  
**Prep Batch:** 1236129_P

### Client Sample ID: Lab Control Sample
**Prep Type:** Total  
**Prep Batch:** 1244053_P

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TestAmerica St. Louis

Lot# F1H200427

18 of 23
## QC Sample Results

Client: Arrowhead Contracting, Inc  
Project/Site: DYES USAF  
TestAmerica Job ID: F1H200427

Method: A-01-R MOD - Iso URANIUM (SHORT CT) DOE A-01-R MOD (Continued)

<table>
<thead>
<tr>
<th>Analyte</th>
<th>Sample Result</th>
<th>Sample Qual</th>
<th>Count Uncert. (2σ±)</th>
<th>Total Uncert. (2σ±)</th>
<th>MDC</th>
<th>LR1</th>
<th>LR1 Result</th>
<th>Qual</th>
<th>Unit</th>
<th>RPD</th>
<th>Limit</th>
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<tr>
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<td>22.6</td>
<td>0.9</td>
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<td>2.1</td>
<td>0.05</td>
<td>22.3</td>
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<td>Uranium 238</td>
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<td>0.06</td>
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<td>pCi/g</td>
<td>23</td>
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<td>Tracer</td>
<td>%Yield</td>
<td>Qualifier</td>
<td>Limits</td>
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</table>

Uranium-232 88  

TestAmerica St. Louis

Lot# F1H200427  
19 of 23
**Tracer/Carrier Summary**

Client: Arrowhead Contracting, Inc  
Project/Site: DYES USAF  
TestAmerica Job ID: F1H200427

Method: A-01-R MOD - Iso URANIUM (SHORT CT) DOE A-01-R MOD  
Matrix: Solid  
Prep Type: Total

<table>
<thead>
<tr>
<th>Lab Sample ID</th>
<th>Client Sample ID</th>
<th>U-232 (30-110)</th>
<th>Percent Yield (Acceptance Limits)</th>
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<tr>
<td>F1H200427001</td>
<td>S1-SS-8N9E</td>
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<td>S1-SS-8N9E DUP</td>
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<td>F1H200427003</td>
<td>S1-SS-12N27E</td>
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<td>F1H200427004</td>
<td>S1-SS-12N21E</td>
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<td>F1H200427005</td>
<td>S1-SS-12N15E</td>
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<td>F1H200427009</td>
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<td>F1H200427012</td>
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<td>F1010000053C</td>
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**Tracer/Carrier Legend**

U-232 = Uranium-232
# Chain of Custody Record

**Location:** TestAmerica St. Louis

**Lot #:** F1H200427

**Date:** 8/18/11

## Analysis Turnaround Time
- **TAT if different from Below:** 2 weeks
- **1 week**
- **2 days**
- **1 day**

## Sample Identification

<table>
<thead>
<tr>
<th>Identification</th>
<th>Sample Date</th>
<th>Sample Time</th>
<th>Sample Type</th>
<th>Matrix</th>
<th># of Cont.</th>
<th>15D/24</th>
<th>15D/24</th>
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<tbody>
<tr>
<td>S1 - SS - 0N 9E</td>
<td>8-17-11</td>
<td>1510</td>
<td>SS</td>
<td>Soil</td>
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<td>[✓]</td>
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<tr>
<td>S1 - SS - 0N 27E</td>
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<td>1525</td>
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<td>Soil</td>
<td>1</td>
<td>[✓]</td>
<td></td>
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<tr>
<td>S1 - SS - 12N 27E</td>
<td>8-17-11</td>
<td>1540</td>
<td>SS</td>
<td>Soil</td>
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<td>[✓]</td>
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<tr>
<td>S1 - SS - 12N 9E</td>
<td>8-17-11</td>
<td>1545</td>
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<td>Soil</td>
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<td>Soil</td>
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<tr>
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<td>1605</td>
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<td>Soil</td>
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<td>55.5% Pond</td>
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<td>S4 - SS - 8N-32E</td>
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<td>1625</td>
<td>SS</td>
<td>Soil</td>
<td>1</td>
<td></td>
<td>[✓]</td>
</tr>
</tbody>
</table>

## Preservation Used:
- 1 = Ice
- 2 = HCl
- 3 = H2SO4
- 4 = HNO3
- 5 = NaOH
- 6 = Other

## Possible Hazard Identification

- Non-Hazard
- Flammable
- Skin Irritant
- Poison B
- Unknown

## Sample Disposal (A fee may be assessed if samples are retained)
- Return To Client
- Disposal By Lab
- Archive For ______ Months

## Special Instructions/QC Requirements & Comments:

- Relinquished by: [Signature]
- Company: Arrowhead
- Date/Tim: 8/18/11 14:00
- Received by: [Signature]
- Company: TA - 57
- Date/Tim: 8/19/11 06:50
**Chain of Custody Record**

**Contact:** Josh Phillips  
**Project Manager:** Josh Phillips  
**Phone:** 815-577-8505  
**Fax:** 815-967-8605  
**Lab Contact:** Frank  
**Carrier:** FedEx  
**Site Contact:**  
**Date:** 8/18/11  
**COC No.:** 2 of 2 COCs

**TestAmerica St. Louis**

**Address:** 1184620 Enright Dr.  
**City/State/Zip:** St. Louis, MO 63141

**Lot #:** F1H200427

**PO #:** 11-105

**Sample Specific Notes:**

<table>
<thead>
<tr>
<th>Sample Identification</th>
<th>Sample Date</th>
<th>Sample Time</th>
<th>Sample Type</th>
<th>Matrix</th>
<th># of Cont.</th>
<th>TAT</th>
<th>Sample Specific Notes</th>
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<tbody>
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<td>1640</td>
<td>SS SOIL</td>
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<td>S4-S5-AOI-7</td>
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**Preservation Used:** 1= Ice, 2= HCl; 3= H2SO4; 4= HNO3; 5= NaOH; 6= Other

**Possible Hazard Identification**

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<tr>
<th>Non-Hazard</th>
<th>Flammable</th>
<th>Skin Irritant</th>
<th>Poison B</th>
<th>Unknown</th>
</tr>
</thead>
</table>

**Return To Client**

**Disposal By Lab**

**Archive For**

**Special Instructions/QC Requirements & Comments:**

**Relinquished by:**

- **Josh Phillips**  
  **Company:** Arrowhead  
  **Date/Time:** 9/18/11 14:00

**Relinquished by:**

- **Company:**  
  **Date/Time:**  
  **Received by:**  
  **Company:**  
  **Date/Time:**  
  **Date/Time:**  
  **Date/Time:**
**CONDITION UPON RECEIPT FORM**

Client: ARROWHEAD CONTROLS

Quote No: 89381

COC/RFA No: N/A

Initiated By: NJD

**Shipping Information**

<table>
<thead>
<tr>
<th>Shipping # (s):*</th>
<th>Sample Temperature (s):**</th>
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<td>1. 8756 2331 2375</td>
<td>1. Ambient 6.</td>
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<td>2.</td>
<td>2.</td>
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<tr>
<td>3.</td>
<td>3.</td>
</tr>
<tr>
<td>4.</td>
<td>4.</td>
</tr>
<tr>
<td>5.</td>
<td>5.</td>
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</tbody>
</table>

*Numbered shipping lines correspond to Numbered Sample Temp lines

**Sample must be received at 4°C ± 2°C - If not, note contents below. Temperature variance does NOT affect the following: Metals-Liquid; Rad tests- Liquid or Solids; Perchlorate

**Condition (Circle “Y” for yes, “N” for no and “N/A” for not applicable):**

1. Y N Are there custody seals present on the cooler?

2. Y N Do custody seals on cooler appear to be tampered with?

3. Y N Were contents of cooler frisked after opening, but before unpacking?

4. Y N Sample received with Chain of Custody?

5. Y N Does the Chain of Custody match sample ID’s on the container(s)?

6. Y N Was sample received broken?

7. Y N Is sample volume sufficient for analysis?

8. Y N Are there custody seals present on bottles?

9. Y N Do custody seals on bottles appear to be tampered with?

10. Y N Was sample received with proper pH1? (If not, make note below)

11. Y N Containers for C-14, H-3 & I-129/131 marked with “Do Not Preserve” label?

12. Y N Sample received in proper containers?

13. Y N Headspace in VOA or TOX liquid samples? (If Yes, note sample ID’s below)

14. Y N Was Internal COC/Workshare received?

---

**Notes:**

---

**Corrective Action:**
- [ ] Client Contact Name:
- [ ] Sample(s) processed “as is”
- [ ] Sample(s) on hold until:
- [ ] Project Management Review: 

Informed by: 
If released, notify: 
Date: 08.36.4

THIS FORM MUST BE COMPLETED AT THE TIME THE ITEMS ARE BEING CHECKED IN. IF ANY ITEM IS COMPLETED BY SOMEONE OTHER THAN THE INITIATOR, THEN THAT PERSON IS REQUIRED TO APPLY THEIR INITIAL AND THE DATE NEXT TO THAT ITEM.
ANALYTICAL REPORT

PROJECT NO. DYESS USAF

B-47 Crash Site

Lot #: F1H260460

Josh Phillips

Arrowhead Contracting, Inc

10981 Eicher Drive

Lenexa, KS 66219

TESTAMERICA LABORATORIES, INC.

Michael C. Franks

Project Manager

September 24, 2011
Case Narrative
LOT NUMBER: F1H260460

This report contains the analytical results for the sample received under chain of custody by TestAmerica St. Louis on August 26, 2011. This sample is associated with your B-47 Crash Site project.

The analytical results included in this report meet all applicable quality control procedure requirements. except as noted on the following page.

The test results in this report meet all NELAP requirements for parameters in which accreditations are held by TestAmerica St. Louis. Any exceptions to NELAP requirements are noted in the case narrative. TestAmerica St. Louis' Florida certification number is E87689. The case narrative is an integral part of this report.

This report shall not be reproduced, except in full, without the written approval of the laboratory.

All chemical analysis results are based upon sample as received, wet weight, unless noted otherwise. All radiochemistry results are based upon sample as dried and ground with the exception of tritium, unless requested wet weight by the client.

Observations/Nonconformances
Reference the chain of custody and condition upon receipt report for any variations on receipt conditions and temperature of samples on receipt.

There are no observations or non-conformances associated with the analyses contained in this report.
# METHODS SUMMARY

**F1H260460**

<table>
<thead>
<tr>
<th>PARAMETER</th>
<th>ANALYTICAL METHOD</th>
<th>PREPARATION METHOD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gamma Spectroscopy - Cesium-137 &amp; Hits</td>
<td>EPA 901.1 MOD</td>
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<tr>
<td>Isotopic Uranium by Alpha Spectroscopy</td>
<td>EML A-01-R MOD</td>
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</tbody>
</table>

**References:**

- EML "ENVIRONMENTAL MEASUREMENTS LABORATORY PROCEDURES MANUAL" HASL-300 28TH EDITION, VOLUME I and II DEPARTMENT OF ENERGY
- EPA "EASTERN ENVIRONMENTAL RADIATION FACILITY RADIOCHEMISTRY PROCEDURES MANUAL" US EPA EPA 520/5-84-006 AUGUST 1984
SAMPLE SUMMARY

F1H260460

<table>
<thead>
<tr>
<th>WO #</th>
<th>SAMPLE#</th>
<th>CLIENT SAMPLE ID</th>
<th>SAMPLED DATE</th>
<th>SAMPL TIME</th>
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<tr>
<td>ML3EP</td>
<td>001</td>
<td>S4-SS-32N-40E</td>
<td>08/17/11</td>
<td>16:25</td>
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**NOTE(S):**

- The analytical results of the samples listed above are presented on the following pages.
- All calculations are performed before rounding to avoid round-off errors in calculated results.
- Results noted as "ND" were not detected at or above the stated limit.
- This report must not be reproduced, except in full, without the written approval of the laboratory.
- Results for the following parameters are never reported on a dry weight basis: color, corrosivity, density, flashpoint, ignitability, layers, odor, paint filter test, pH, porosity pressure, reactivity, redox potential, specific gravity, spot tests, solids, solubility, temperature, viscosity, and weight.
#### REANALYSIS / SUB-CONTRACT / CLIENT RETURN FORM

**Request Initiated by:** M. Franks  
**Request Date:** 08/26/11  
**Quote Number:** 89381  
**Client Number:** 1353864  
**SDG Number:**

**Request is for (check one):**  
- [ ] Return to Client – *(Client FedEx #)*  
- [ ] Reanalysis  
- [ ] Sub-Contract Sample  
- [x] Additional Analysis

**Old Lot Number:** F1H200427-012

<table>
<thead>
<tr>
<th>Client ID</th>
<th>Sampled date/time*</th>
<th>Shelf Location</th>
<th>Line item from quote (include Rad Screen if required)</th>
</tr>
</thead>
</table>
| S4-SS-32N-40E | 08/17/11 1625      | RAD           | SOLID, SPLP EXTRACTION                  
|              |                    |               | SOLID, 901.1, Gamma Spec. (SPLP)            
|              |                    |               | SOLID, A-01-R, Iso Uranium (SPLP)            |

* or attach original Chain of Custody

**Due Date for New Login:**
- **Analytical**  
  09/15/11
- **Report**  
  09/16/11

**For Sub-Contract or Return to Client ONLY**

- **Shipping Address:**
- **Contact Person:**
- **Phone Number:**

**Project Manager Signature:**

**DO NOT HAVE LAB PULL ORIGINAL SAMPLE**

**Completed by:**  
**Date:**

**New Login Lot Number:**  
**Initial that Containers were Re-labeled:**
# Chain of Custody Record

**Contact:** Josh Phillips  
**Project Manager:** J. Phillips  
**Site Contact:** Phil  
**Date:** 8/18/11  
**COC No.:**  
**Lab Contact:** Carrier:  
**Job No.:**  
**SDG No.:**

## Analysis Turnaround Time
- TAT if different from Below
- 2 weeks
- 1 week
- 2 days
- 1 day

<table>
<thead>
<tr>
<th>Sample ID</th>
<th>Sample Date</th>
<th>Sample Time</th>
<th>Sample Type</th>
<th>Matrix</th>
<th># of Cont.</th>
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<td>8-17-11</td>
<td>1600</td>
<td>SS</td>
<td>Soil</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>S1-SS-18N18E</td>
<td>8-17-11</td>
<td>1605</td>
<td>SS</td>
<td>Soil</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>SS Pond</td>
<td>8-17-11</td>
<td>1610</td>
<td>SS</td>
<td>Soil</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>S4-SS-8N32E</td>
<td>8-17-11</td>
<td>1615</td>
<td>SS</td>
<td>Soil</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>S4-SS-16N40E</td>
<td>8-17-11</td>
<td>1620</td>
<td>SS</td>
<td>Soil</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>S4-SS-32N40E</td>
<td>8-17-11</td>
<td>1625</td>
<td>SS</td>
<td>Soil</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>

**Preservation Used:**  
1 = Ice, 2 = HCl, 3 = H2SO4, 4 = HNO3, 5 = NaOH, 6 = Other

**Possible Hazard Identification**

**Special Instructions/QC Requirements & Comments:**

Relinquished by: Josh Phillips  
**Company:** Arrowhead  
**Date/Time:** 8/18/11 14:00  
**Received by:**  
**Company:**  
**Date/Time:**

Relinquished by:  
**Company:**  
**Date/Time:**  
**Received by:**  
**Company:**  
**Date/Time:**

Relinquished by:  
**Company:**  
**Date/Time:**  
**Received by:**  
**Company:**  
**Date/Time:**

---

**Sample Disposal:** (A fee may be assessed if samples are retained)

**Return To Client**

**Disposal By Lab**

**Archive For**

**Months**
# Chain of Custody Record

<table>
<thead>
<tr>
<th>Sample Identification</th>
<th>Sample Date</th>
<th>Sample Time</th>
<th>Sample Type</th>
<th>Matrix</th>
<th># of Cont.</th>
<th>Sample Specific Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>34-SS-40N-40E</td>
<td>8-17-11</td>
<td>16:30</td>
<td>SS</td>
<td>Soil</td>
<td>1</td>
<td>SS = 0-12'</td>
</tr>
<tr>
<td>84-SS-32N-56E</td>
<td>8-17-11</td>
<td>16:35</td>
<td>SS</td>
<td>Soil</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>84-SS-24H-56E</td>
<td>8-17-11</td>
<td>16:40</td>
<td>SS</td>
<td>Soil</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>84-SS-A01-7</td>
<td>8-17-11</td>
<td>16:45</td>
<td>SS</td>
<td>Soil</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>84-SS-A01-2</td>
<td>8-17-11</td>
<td>17:00</td>
<td>SS</td>
<td>Soil</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>84-SS-A01-7 SPLIT</td>
<td>8-17-11</td>
<td>17:05</td>
<td>SS</td>
<td>Soil</td>
<td>1</td>
<td>TCEQ SPLIT</td>
</tr>
<tr>
<td>84-SS-A01-1</td>
<td>8-18-11</td>
<td>09:45</td>
<td>SS</td>
<td>Soil</td>
<td>1</td>
<td>TCEQ SPLIT</td>
</tr>
<tr>
<td>847-SS-GENERAL A01</td>
<td>8-18-11</td>
<td>10:45</td>
<td>SS</td>
<td>Soil</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>

**Preservation Used:** 1 = Ice, 2 = HCl; 3 = H2SO4; 4 = HNO3; 5 = NaOH; 6 = Other

**Possible Hazard Identification**

- Non-Hazard
- Flammable
- Skin Irritant
- Poison B
- Unknown

**Special Instructions/QC Requirements & Comments:**

- Sample Disposal (A fee may be assessed if samples are retained)
- Return To Client
- Disposal By Lab
- Archive For Months

**Relinquished by:**

- Josh Phillips
- Anwaves
- Date/Time: 8/18/11 14:00
- Received by: TCEQ
- Company: TA 57
- Date/Time: 8/19/11 06:50
Lot #(s): F1H200427

CONDITION UPON RECEIPT FORM

Client: ARROWHEAD CONTROLS
Quote No: 89381
COC/RFA No: N/A

Initiated By: N/A
Date: 8/19/11
Time: 0650

Lot# F1H260460

Shipping Information

Shipping # (s):*  1. E756 2321 2875

Sample Temperature (s):**  1. AMBIENT

Condition (Circle "Y" for yes, "N" for no and "N/A" for not applicable):

1. Y N Are there custody seals present on the cooler?
2. Y N N/A Do custody seals on cooler appear to be tampered with?
3. Y N Were contents of cooler frisked after opening, but before unpacking?
4. Y N Sample received with Chain of Custody?
5. Y N N/A Does the Chain of Custody match sample ID's on the container(s)?
6. Y N Was sample received broken?
7. Y N Is sample volume sufficient for analysis?

1 For DOE-AL (Pantex, LANL, Sandia) sites, pH of ALL containers received must be verified, EXCEPT VOA, TOX, Oil & Grease and soils.

Notes:

Corrective Action:

☐ Client Contact Name:

☐ Sample(s) processed "as is"

☐ Sample(s) on hold until:

Project Management Review:

This form must be completed at the time the items are being checked in. If any item is completed by someone other than the initiator, then that person is required to apply their initial and the date next to that item.

ADMIN-0004 rev13, REVISED 05/27/11 \Slvr01\QA\FORMS\ST-LOUIS\ADMIN\Admin-0004 CUR.doc
Arrowhead Contracting, Inc

Client Sample ID: S4-SS-32N-40E

Radiochemistry

Lab Sample ID: F1H260460-001
Work Order: ML3EP
Matrix: SOLID

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Result</th>
<th>Qual</th>
<th>Total Uncert. (2σ+/−)</th>
<th>RL</th>
<th>mdc</th>
<th>Prep Date</th>
<th>Analysis Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gamma Cs-137 &amp; Hits by EPA 901.1 MOD</td>
<td>pCi/L</td>
<td>7.4</td>
<td>20.0</td>
<td>14</td>
<td>Batch # 1249109</td>
<td>Yld %</td>
<td>09/06/11</td>
</tr>
<tr>
<td>Cesium 137</td>
<td>-1.2</td>
<td>U</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| Iso URANIUM (SHORT CT) DOE A-01-R MOD | PCl/L | 5.0 | 1.0 | 0.1 | Batch # 1257044 | Yld % 81 | 09/14/11 | 09/14/11 |
| Uranium 234 | 53.4 | | | | |
| Uranium 235/236 | 1.97 | 0.50 | 1.00 | 0.07 | |
| Uranium 238 | 0.62 | J | 0.25 | 1.00 | 0.14 | |

Soil Sampling Results for S4-SS-32N-40E.
U-234: 131 +/- 11 pCi/g (95.4 %)
U-235: 4.61 +/- 0.64 pCi/g (3.4 %)
U-238: 1.66 +/- 0.31 pCi/g (1.2 %)
Total Uranium: 137.3 +/- 11.0 pCi/g

Water Total Uranium: 56.0 pCi/L
(U-234: 95.4 %, U-235: 3.5 %, U-238: 1.1 %)
Therefore partition coefficient: 2450 mL/g
RESRAD Runs Used Default of 50 mL/g (fifty times more conservative than result)
EPA in 540-R-00-006-TBD recommends a default of 0.4 mL/g (6,000 times more conservative than result)

Uranium Concentration by Mass:
U-234: 0.0086 μg/L (0.3 %)
U-235: 0.91 μg/L (33 %)
U-238: 1.85 μg/L (66.7 %)
Total: 2.77 μg/L (SDWA limit: 30 μg/L)
(Note: EPA recommends dilution factor of 20)

SA:
U-234 - 6.21 E-03 Ci/g
U-235 - 2.16 E-06 Ci/g
U-238 - 3.35 E-07 Ci/g

NOTE (S)

Data are incomplete without the case narrative.
MDC is determined by instrument performance only.
Bold results are greater than the MDC.
J Result is greater than sample detection limit but less than stated reporting limit.
U Result is less than the sample detection limit.
Ground Water Committed Effective Dose Equivalent under Radiological Considerations*

<table>
<thead>
<tr>
<th>Isotope</th>
<th>Water Concentration (pCi/L)</th>
<th>Fraction</th>
<th>Intake (L/d)</th>
<th>Intake (L/y)</th>
<th>FGR11 CEDE (Sv/Bq)</th>
<th>Bq-y per pCi-Sv</th>
<th>CEDE (mrem/y) for given Dilution Factors</th>
</tr>
</thead>
<tbody>
<tr>
<td>U-234</td>
<td>53.4</td>
<td>0.954</td>
<td>2</td>
<td>730</td>
<td>7.66E-08</td>
<td>3700</td>
<td>11.05/20</td>
</tr>
<tr>
<td>U-235</td>
<td>1.97</td>
<td>0.035</td>
<td>2</td>
<td>730</td>
<td>7.19E-08</td>
<td>3700</td>
<td>0.38/0.02</td>
</tr>
<tr>
<td>U-238</td>
<td>0.62</td>
<td>0.012</td>
<td>2</td>
<td>730</td>
<td>6.88E-08</td>
<td>3700</td>
<td>0.12/0.01</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>11.5/0.58</td>
</tr>
</tbody>
</table>

* Note: SDWA recognizes a chemical toxicity limit only for uranium. SDWA recognizes a 4 mrem in a year limit for β/γ-emitters, based on ICRP 2 procedures.
### METHOD BLANK REPORT

#### Radiochemistry

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Result</th>
<th>Qual</th>
<th>Total Uncert. (2σ±/-)</th>
<th>RL</th>
<th>MDC</th>
<th>Lab Sample ID</th>
<th>Prop Date</th>
<th>Analysis Date</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Gamma Cs-137 &amp; Hits by EPA 901.1 MOD</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Cesium 137</td>
<td>1</td>
<td>U</td>
<td>6.1</td>
<td>20.0</td>
<td>11</td>
<td>F1I060000-109B</td>
<td>09/06/11</td>
<td>09/22/11</td>
</tr>
<tr>
<td><strong>Iso URANIUM (SHORT CT) DOE A-01-R MOD</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Uranium 234</td>
<td>0.005</td>
<td>U</td>
<td>0.041</td>
<td>1.00</td>
<td>0.11</td>
<td>F1I400000-044B</td>
<td>09/14/11</td>
<td>09/14/11</td>
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<tr>
<td>Uranium 235/236</td>
<td>-0.009</td>
<td>U</td>
<td>0.013</td>
<td>1.00</td>
<td>0.12</td>
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<td>09/14/11</td>
<td>09/14/11</td>
</tr>
<tr>
<td>Uranium 238</td>
<td>0.028</td>
<td>U</td>
<td>0.056</td>
<td>1.00</td>
<td>0.10</td>
<td></td>
<td>09/14/11</td>
<td>09/14/11</td>
</tr>
</tbody>
</table>

#### NOTE(S)

Data are incomplete without the case narrative.

MDC is determined using instrument performance only

Bold results are greater than the MDC.

U Result is less than the sample detection limit.
# Laboratory Control Sample Report

**Radiochemistry**

**Client Lot ID:** F1H260460  
**Matrix:** SOLID

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Spike Amount</th>
<th>Result</th>
<th>Total Uncert. (2 σ+/-)</th>
<th>MDC</th>
<th>% Yid</th>
<th>% Rec</th>
<th>QC Control Limits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gamma Cs-137 &amp; Hits by EPA 901.1 MOD</td>
<td>141000</td>
<td>138000</td>
<td>12000</td>
<td>400</td>
<td>98</td>
<td>(85 - 118)</td>
<td></td>
</tr>
<tr>
<td>Americium 241</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cesium 137</td>
<td>53100</td>
<td>52700</td>
<td>3300</td>
<td>200</td>
<td>99</td>
<td>(90 - 122)</td>
<td></td>
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<tr>
<td>Cobalt 60</td>
<td>87900</td>
<td>85200</td>
<td>5200</td>
<td>200</td>
<td>97</td>
<td>(90 - 116)</td>
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</tr>
<tr>
<td>Batch #:</td>
<td>1249109</td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Analysis Date:</td>
<td>09/21/11</td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Iso URANIUM (SHORT CT) DOE A-01-R MOD</th>
<th>PCI/L</th>
<th>A-01-R MOD</th>
<th>F11140000-044C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Uranium 234</td>
<td>13.0</td>
<td>11.9</td>
<td>1.4</td>
</tr>
<tr>
<td>Uranium 238</td>
<td>13.5</td>
<td>12.3</td>
<td>1.5</td>
</tr>
<tr>
<td>Batch #:</td>
<td>1257044</td>
<td></td>
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</tr>
<tr>
<td>Analysis Date:</td>
<td>09/14/11</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**NOTE(S)**

MDC is determined by instrument performance only  
Calculations are performed before rounding to avoid round-off error in calculated results.
### DUPPLICATE EVALUATION REPORT

**Radiochemistry**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>SAMPLE Result</th>
<th>Total Uncert. (2σ+/−)</th>
<th>% Yld</th>
<th>DUPLICATE Result</th>
<th>Total Uncert. (2σ+/−)</th>
<th>% Yld</th>
<th>QC Sample ID</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Gamma Cs-137 &amp; Hits by EPA 901.1 MOD pCi/L 901.1 MOD</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td><strong>F1H260460-001</strong></td>
</tr>
<tr>
<td>Cesium 137</td>
<td>-1.2 U</td>
<td>7.4</td>
<td></td>
<td>-3.0 U</td>
<td>9.2</td>
<td></td>
<td>87</td>
</tr>
<tr>
<td><strong>Iso URANIUM (SHORT CT) DOE A-01-R MOD PCI/L A-01-R MOD</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td><strong>F1H260460-001</strong></td>
</tr>
<tr>
<td>Uranium 234</td>
<td>53.4</td>
<td>5.0</td>
<td>81</td>
<td>47.3</td>
<td>4.4</td>
<td>95</td>
<td>12</td>
</tr>
<tr>
<td>Uranium 235/236</td>
<td>1.97</td>
<td>0.50</td>
<td>81</td>
<td>1.56</td>
<td>0.41</td>
<td>95</td>
<td>23</td>
</tr>
<tr>
<td>Uranium 238</td>
<td>0.62 J</td>
<td>0.25</td>
<td>81</td>
<td>0.89 J</td>
<td>0.27</td>
<td>95</td>
<td>35</td>
</tr>
<tr>
<td><strong>Batch #:</strong></td>
<td>1249109 (Sample)</td>
<td>1257044 (Duplicate)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**NOTE(S)**

Data are incomplete without the case narrative. Calculations are performed before rounding to avoid round-off error in calculated results.

**J** Result is greater than sample detection limit but less than stated reporting limit.

**U** Result is less than the sample detection limit.
APPENDIX E
DAILY QUALITY CONTROL REPORT
Sullivan-Arrowhead Federal Services
A Sullivan International Group, Inc. • Arrowhead Contracting, Inc.
SDVOSB Joint Venture

Daily Quality Control Report

REPORT NO. 1  SUBCONTRACT NO. W9128F-10-0643  Date: Monday, August 15, 2011

LOCATION OF WORK:  B-47 Plane Crash Site, Dyess AFB, Abilene, TX

DESCRIPTION:  Mobilization Activities Site Infrastructure Set up and Site survey

WEATHER CLASSIFICATION:

<table>
<thead>
<tr>
<th>Class</th>
<th>Description</th>
<th>Classification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Class A</td>
<td>No interruptions of any kind from weather conditions occurring on this or previous shifts</td>
<td></td>
</tr>
<tr>
<td>Class B</td>
<td>Weather occurred during this shift that caused a complete stoppage of work</td>
<td>Class: A</td>
</tr>
<tr>
<td>Class C</td>
<td>Weather occurred during this shift that caused a partial stoppage of work</td>
<td>Temperature</td>
</tr>
<tr>
<td>Class D</td>
<td>Weather overhead excellent or suitable for work during shift. Work completely stopped due to results of previous adverse weather.</td>
<td>Max 98°F Min. 85°F</td>
</tr>
<tr>
<td>Class E</td>
<td>Weather overhead excellent or suitable during shift but work partially stopped due to previous adverse manner.</td>
<td>Precipitation: None</td>
</tr>
<tr>
<td>Other</td>
<td>Explain:</td>
<td>Inches: 0.0&quot;</td>
</tr>
</tbody>
</table>

1. Work Performed Today:
   Josh Phillips arrived onsite at 1100. A short meeting was conducted with Dr. Rademacher, Bret Rogers and Mike Gifford to discuss the weeks activities. Mobilization of a skid steer occurred. Josh began to assist USAF with AOI-1 Survey and excavation area delineation. All involved off site at 16:30.

2. Work Performed Today by Subcontractors:
   None.

3. Type and Results of Inspection: (Include Satisfactory Work Completed or Deficiencies with Action to be taken).
   None.

4. List Type and Location of Tests Performed and Results of These Tests:
   None.

5. Verbal Instructions Received:
   None.
6. Corrective Actions Proposed/Taken:
   None.

7. Remarks:
   None.

8. Safety Violations Observed:
   None.

9. CERTIFICATION: I certify that the above report is complete and correct and that I, or my
   authorized representative, have inspected all work performed this day by the contractor and each
   subcontractor and have determined that all materials, equipment, and workmanship are in strict
   compliance with the plans and specifications, except as may be noted above.

   ________________________________
   Josh Phillips
   Quality Control Officer
Sullivan-Arrowhead Federal Services
A Sullivan International Group, Inc. • Arrowhead Contracting, Inc.
SDVOSB Joint Venture

DAILY TAILGATE SAFETY MEETING LOG

Date: 8/15/11

Location: Abilene, TX

Meeting conducted by: Phillips

Details of safety meeting presented (use back of sheet if necessary):

Level of Protection: Level D

Contaminants: LSA

Physical Hazards: Snakes, Heat Stress

Other:

Are any permits/clearances required on this day?

ATTENDEES:

Printed Name: Josh Phillips

Signature:
REPORT NO. 2  SUBCONTRACT NO. W9128F-10-D-0043  Date: Tuesday, August 16, 2011

LOCATION OF WORK:  B-47 Plane Crash Site, Dyess AFB, Abilene, TX

DESCRIPTION:  Mobilization Activities Site clearing and grubbing and Site survey

WEATHER CLASSIFICATION:

<table>
<thead>
<tr>
<th>Class</th>
<th>Description</th>
<th>Classification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Class A</td>
<td>No interruptions of any kind from weather conditions occurring on this or previous shifts</td>
<td></td>
</tr>
<tr>
<td>Class B</td>
<td>Weather occurred during this shift that caused a complete stoppage of work</td>
<td>Class: A</td>
</tr>
<tr>
<td>Class C</td>
<td>Weather occurred during this shift that caused a partial stoppage of work</td>
<td>Temperature</td>
</tr>
<tr>
<td>Class D</td>
<td>Weather overhead excellent or suitable for work during shift. Work completely stopped due to results of previous adverse weather.</td>
<td>Max 100°F Min. 85°F</td>
</tr>
<tr>
<td>Class E</td>
<td>Weather overhead excellent or suitable during shift but work partially stopped due to previous adverse manner.</td>
<td>Precipitation: None</td>
</tr>
<tr>
<td>Other</td>
<td>Explain.</td>
<td>Inches: 0.0&quot;</td>
</tr>
</tbody>
</table>

1. Work Performed Today:
   Josh Phillips (Sullivan/AFS), Jerry Craft (Sullivan/AFS), Mike Marable (EDI), Scott Baing (EDI), Steven Rademacher, Brett Rogers, Mike Gifford, arrived onsite at 0730. A tail gate safety meeting was conducted and short meeting was conducted to discuss events for the day, that included field mowing, AOI-2 area radiological survey, equipment delivery, and the weeks schedule. Additional mowing occurred that allowed for vehicle parking during intrusive activities. Josh, Mike (EDI) and Scott (EDI) joined the effort and assisted Dr. Rademacher’s field crew with the AOI-2 survey. The excavator arrived on site at 0900. Upon arrival the excavator was checked into the site. During site preparation activities a low hanging power wire was noted. A revised path to the excavation area was made for the waste truck and excavation equipment. Trees impeding the haul road were removed with construction equipment. Excavation areas were delineated for excavation activities on 8/17/11. All involved were off site at 1730.

2. Work Performed Today by Subcontractors:
   Mike Marable and Scott Baing with EDI Surveyed incoming construction equipment and supported Dr. Rademacher’s radiological survey crew for delineation of excavation areas AOI-1 and AOI-2.
US Bulk waste truck driver (Gary) onsite to plan truck route to excavation areas.
Ed Kinny (backfill provider) onsite to plan backfill material placement and delivery.

3. **Type and Results of Inspection:** (include Satisfactory Work Completed or Deficiencies with Action to be taken).
   None.

4. **List Type and Location of Tests Performed and Results of These Tests:**
   Radiological surveys of incoming equipment to be used during excavation activities indicated no issues.

5. **Verbal Instructions Received:**
   None.

6. **Corrective Actions Proposed/Taken:**
   None.

7. **Remarks:**
   None.

8. **Safety Violations Observed:**
   None.

9. **CERTIFICATION:** I certify that the above report is complete and correct and that I, or my authorized representative, have inspected all work performed this day by the contractor and each subcontractor and have determined that all materials, equipment, and workmanship are in strict compliance with the plans and specifications, except as may be noted above.

   Josh Phillips
   Quality Control Officer
Sullivan-Arrowhead Federal Services
A Sullivan International Group, Inc. • Arrowhead Contracting, Inc.
5DVOSB Joint Venture

DAILY TAILGATE SAFETY MEETING LOG

Date: 8/14/11
Location: Abilene, TX
Meeting conducted by: J. Phillips

Client: U.S. Corps of Engineers, Omaha
Job No.: 10-114

Details of safety meeting presented (use back of sheet if necessary):

Level of Protection: Level D
Contaminants: Uranium
Physical Hazards: Slip, trips, falls, snakes, heavy equipment
Other:

Are any permits/clearances required on this day?

ATTENDEES:

Printed Name: Signature:
Josh Phillips
Lt. Col. Mike Massad
Jerry Craft
Scott Brink
Michael Marable
Bret Rogers

Job Phillips
Jerry Craft
Michael Marable
Bret Rogers
HEAVY EQUIPMENT INITIAL INSPECTION CHECKLIST

<table>
<thead>
<tr>
<th>Project Name:</th>
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<th>Client:</th>
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<tbody>
<tr>
<td>B-47 Plane Crash Site</td>
<td>10-114</td>
<td>USACE Omaha</td>
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<tr>
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<tr>
<td>Excavation of Contaminated Soils</td>
<td>Sullivan-AFS.</td>
<td>Subcontract No.</td>
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<td>W9128F-10-D-0043</td>
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<tr>
<th>Type and Make of Equipment</th>
<th>Model</th>
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<tr>
<td>Excavator</td>
<td>CAT 320</td>
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## Checklist

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<td>23. Are fuel tanks located so that spills or overflows will not come in contact with engine or exhaust? (16.B.04)</td>
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<td>24. Are exhausts and discharges so directed as not to endanger workmen or obstruct view of operator? (16.B.05)</td>
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<td>25. Are guards in place on equipment with drop type skips? (16.B.03)</td>
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<td>26. Are adequate seats provided for all riders? (16.A.07 and 18.C.01)</td>
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<td>27. Are tires in serviceable condition? Are testing/inspections documented? (18.A.02)</td>
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<td>28. Are steering linkage and tie rod in good operating condition? Are testing/inspections documented? (18.A.02)</td>
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<td>29. Are dump bodies provided with holding device or other suitable device for locking body in raised position? (18.A.10)</td>
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<td>34. Is an acceptable spark arrestor installed and working? (?)</td>
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<tr>
<td>36. Does welding equipment comply with code requirements? (10.A.10 and 10.E.01)</td>
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<td>38. Do electrical components comply with code? (10.E.01)</td>
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<td>40. Are approved seat belts and roll-over protection provided? (16.B.08, 16.B.12, and 18.B.02)</td>
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<td>41. Is recommended preventive maintenance being followed? (16.A.08 and 18.A.02)</td>
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### CHECKLIST

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<tr>
<td>42. Do helicopter cranes meet construction requirements (16.J.01)</td>
<td></td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>43. Does hydraulic equipment meet special safety conditions (71.H.08, 71.H.09, and 13.A.09)</td>
<td></td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>44. Is concrete equipment fitted with adequate safety devices? (27.A.04)</td>
<td></td>
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</tr>
<tr>
<td>45. Are elevating and rotating work platforms in conformance with ANSI A92.2? (22.K.01)</td>
<td></td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>46. Do conveyors, cableways, and related equipment conform to ANSI 320.01? (7)</td>
<td></td>
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<tr>
<td>47. Are pile drivers equipped with all appropriate safety devices? (16.L)</td>
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<tr>
<td>48. Do material hoists conform to ANSI A10.5? (16.K.01)</td>
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<td>51. Is high voltage sign posted? (7)</td>
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<td>52. Is equipment fitted with positive stops for rotation when near power lines? (11.E and 16.D.06)</td>
<td></td>
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<tr>
<td>53. Is there any visible evidence of damage to boom? (16.C.12 and Appendix H)</td>
<td></td>
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</tr>
<tr>
<td>54. Is the boom position indicator operating and visible to operator? (16.D.01 and 16.D.04)</td>
<td></td>
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<tr>
<td>55. Have all operators had a current physical examination? (1.C and 16.C.04)</td>
<td></td>
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<tr>
<td>56. Is braking equipment capable of effectively braking, lowering, and safely holding a load of at least the full rated load as required? (7)</td>
<td></td>
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</table>

Remarks:

Certification: I hereby certify that this item of equipment is in good operating condition and that it meets all above requirements except as noted in the remarks.

Signature of Competent Mechanic: 

Date: 8/4/11

Signature of Superintendent/Quality Control Engineer: 

Date: 8/4/11
## HEAVY EQUIPMENT INITIAL INSPECTION CHECKLIST

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<td>52. Is equipment fitted with positive stops for rotation when near power lines? (11.E and 16.D.06)</td>
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<tr>
<td>53. Is there any visible evidence of damage to boom? (16.C.12 and Appendix H)</td>
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<td>54. Is the boom position indicator operating and visible to operator? (16.D.01 and 16.D.04)</td>
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<tr>
<td>55. Have all operators had a current physical examination? (1.C and 16.C.04)</td>
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<tr>
<td>56. Is braking equipment capable of effectively braking, lowering, and safely holding a load of at least the full rated load as required? (?)</td>
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</tr>
</tbody>
</table>

Remarks:

Certification: I hereby certify that this item of equipment is in good operating condition and that it meets all above requirements except as noted in the remarks.

[Signature]  [Date]  B-16-11
Signature of Competent Mechanic
[Signature]  [Date]
Signature of Superintendent/Quality Control Engineer
### HEAVY EQUIPMENT DAILY INSPECTION CHECKLIST

<table>
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Certification: [Signature]

Date: 8/4/4
## HEAVY EQUIPMENT DAILY INSPECTION CHECKLIST

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<td>10-114</td>
<td>USACE Omaha</td>
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<td>Excavation of Contaminated Soils</td>
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<td>W9128F-10-D-0043</td>
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<th>Equipment Description:</th>
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<tr>
<td>Skid Steer</td>
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**Remarks:**

**Certification**  
Signature of Certified Operator  
8/16/11  
Date
<table>
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<tr>
<th>Task</th>
<th>Yes</th>
<th>No</th>
<th>NA</th>
<th>Remarks</th>
</tr>
</thead>
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<tr>
<td>Is the work being performed in accordance with the Work Plan?</td>
<td></td>
<td>N</td>
<td></td>
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</tr>
<tr>
<td>Is the work being performed cautiously and with acceptable levels of workmanship?</td>
<td></td>
<td>X</td>
<td></td>
<td></td>
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<tr>
<td>Is equipment being operated properly?</td>
<td></td>
<td>N</td>
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<tr>
<td>Is the work being performed using proper methods and procedures?</td>
<td></td>
<td>N</td>
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<tr>
<td>Have any defective or damaged materials been identified?</td>
<td></td>
<td>X</td>
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<tr>
<td>Are results of applicable tests within acceptable levels?</td>
<td></td>
<td>X</td>
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<tr>
<td>Is the work being performed in accordance with the ESHP?</td>
<td></td>
<td>X</td>
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<tr>
<td>Have pertinent records been completed or collected?</td>
<td></td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Have any nonconformances been identified, corrected, and re-inspected?</td>
<td></td>
<td>X</td>
<td></td>
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</tr>
</tbody>
</table>

Notes:
Sullivan-Arrowhead Federal Services
A Sullivan International Group, Inc. + Arrowhead Contracting, Inc.
SDVOSB Joint Venture

Daily Quality Control Report

REPORT NO. 3 SUBCONTRACT NO. W9128F-10-D-0043 Date: Wednesday, August 17, 2011

LOCATION OF WORK: B-47 Plane Crash Site, Dyess AFB, Abilene, TX

DESCRIPTION: Excavation Activities and Excavation Conformation Sampling

WEATHER CLASSIFICATION:

<table>
<thead>
<tr>
<th>Class</th>
<th>Description</th>
<th>Classification</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>No interruptions of any kind from weather conditions occurring on this or previous shifts</td>
<td></td>
</tr>
<tr>
<td>B</td>
<td>Weather occurred during this shift that caused a complete stoppage of work</td>
<td>Class: A</td>
</tr>
<tr>
<td>C</td>
<td>Weather occurred during this shift that caused a partial stoppage of work</td>
<td>Temperature</td>
</tr>
<tr>
<td>D</td>
<td>Weather overhead excellent or suitable for work during shift. Work completely stopped due to results of previous adverse weather.</td>
<td>Max 102°F</td>
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<tr>
<td></td>
<td></td>
<td>Min. 85°F</td>
</tr>
<tr>
<td>E</td>
<td>Weather overhead excellent or suitable during shift but work partially stopped due to previous adverse manner.</td>
<td>Precipitation: None</td>
</tr>
<tr>
<td>Other</td>
<td>Explain:</td>
<td>Inches: 0.0&quot;</td>
</tr>
</tbody>
</table>

1. **Work Performed Today:**
   Josh Phillips (Sullivan/AFS), Jerry Craft (Sullivan/AFS), Mike Marable (EDI), Scott Baing (EDI), Steven Rademacher, Brett Rogers, Mike Gifford, Judy Overby arrived onsite at 0730. A tail gate safety meeting was conducted and short meeting was conducted to discuss events for the day, that included AOI-1 and AOI-2 excavation activities and excavation conformation sampling. Excavation activities began at AOI-1. An initial cut of soil was removed to the specified 1 ft excavation depth. After the initial 1 ft was removed, USAF and EDI began to scan AOI-1 with radiological detection equipment (Fiddler). The results of the detection equipment indicated additional areas for excavation. These areas were removed. Excavation Area AOI-2 began at 0915. Again, the initial 1ft of material was removed. The area was then scanned and additional material was removed were detection equipment indicated. Excavation activities ceased at approximately 1130. Excavation of AOI-1 and AOI-2 resulted in collection of approximately 15-18 CY. After excavation activities, the waste truck was scanned for exterior contamination. Scanning of the waste truck indicated no contamination. The waste truck was manifested and left site at 1230 for transport to US Ecology's Idaho Facility. After excavation activities, Sullivan/AFS began collection of excavation conformation
sampling. With the assistance of the USAF sample locations were identified and correlated to
the pre-excavation survey. Samples were collected.
TCEQ representatives were onsite at 1300 to perform scans of the excavation areas and
perform sampling activities. TCEQ rep’s were given a brief safety review prior to entering in
the construction zone.
Equipment used during excavation activities were decontaminated and scanned for
radiological contamination. All scanning results were negative.
All involved were off site at 1730.

2. **Work Performed Today by Subcontractors:**
   Mike Marable and Scott Baing with EDI Surveyed incoming construction equipment and
   supported Dr. Rademacher’s radiological survey crew for delineation of excavation areas
   AOI-1 and AOI-2.
   US Bulk waste truck driver (Gary) onsite for loading of excavated soil.

3. **Type and Results of Inspection:** (include Satisfactory Work Completed or Deficiencies
with Action to be taken).
   None.

4. **List Type and Location of Tests Performed and Results of These Tests:**
   Radiological surveys of incoming equipment to be used during excavation activities indicated
   no issues.

5. **Verbal Instructions Received:**
   None.

6. **Corrective Actions Proposed/Taken:**
   None.

7. **Remarks:**
   None.

8. **Safety Violations Observed:**
   None.

9. **CERTIFICATION:** I certify that the above report is complete and correct and that I, or my
    authorized representative, have inspected all work performed this day by the contractor and each
    subcontractor and have determined that all materials, equipment, and workmanship are in strict
    compliance with the plans and specifications, except as may be noted above.

   Josh Phillips
   Quality Control Officer
Sullivan-Arrowhead Federal Services
A Sullivan International Group, Inc. • Arrowhead Contracting, Inc.
SDVOSB Joint Venture

DAILY TAILGATE SAFETY MEETING LOG

Date: 8/17/11

Location: Abilene, TX

Meeting conducted by: Josh Phillips

Details of safety meeting presented (use back of sheet if necessary):

Level of Protection: Level D

Contaminants: ESA

Physical Hazards: Heavy Equipment, Snakes, Heat

Other:

Are any permits/clearances required on this day?:

ATTENDEES:

Printed Name:  

Signature:  

Josh Phillips

Steven Rademacher (USAF)

Jerry Craft

Lt. Mike Gillis

Bret Rogers
HEAVY EQUIPMENT DAILY INSPECTION CHECKLIST

<table>
<thead>
<tr>
<th>Project Name: B-47 Plane Crash Site</th>
<th>Project Number: 10-114</th>
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<td>Project: Excavation of Contaminated Soils</td>
<td>Contractor: Sullivan-AFS.</td>
<td>Contract No.: W91287-10-D-0043</td>
</tr>
<tr>
<td>Equipment Description:</td>
<td>Model No.(s): CAT 279</td>
<td>Serial No.(s):</td>
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Remarks: ____________________________________________________________________________________________

Certification: ________________________________________________________________________________________

Signature of Certified Operator: ____________________________________________________________

Date: 8/17/11
**Sullivan-Arrowhead Federal Services**  
*A Sullivan International Group, Inc. • Arrowhead Contracting, Inc. • SDVOSB Joint Venture*

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Remarks:

Certification: [Signature]

Signature of Certified Operator: [Signature]

Date: 8/17/11
INTRUSIVE ACTIVITIES PERMIT

Project Name: B-47 Plane Crash Site

Clearance is permitted for intrusive activity at: B-47 Crash Site

The attached map indicates the limits of the permitted intrusive activity. The area has not been staked or clearly marked.

Utilities Locate Service Reference Number: 112371

Description of permitted work:

1ft Excavation of 3 Areas @ crash site

Specific location of permitted work:

They 2-77 6.6 miles South of Winners Hwy. Turn East on County Road 257. Turn North on First Ave Rd

Precautions or comments:

Date Clearance Permitted: 8/1/11

Date Clearance Terminated: 8/18/11

Request Initiated By: Sullivan AFS

Phone No.: 515-577-8503

Organization: Sullivan AFS

Permission to proceed with intrusive activity granted:

Field Supervisor/Project Manager

Date: 8/16/11

Permission to proceed with intrusive activity granted:

Site Safety and Health Officer

Date: 8/16/11

I agree to perform work within the limits of this permit:

Supervisor/Foreman/Contractor

Date
**UTILITY CLEARANCE FORM**

Project Name: B-47 Plane Crash Site  
Project No. 10-114

Date: 8/17/11  
Location of Excavation: Abilene, TX

The undersigned personnel have staked or otherwise located existing underground utilities in order to proceed with excavation required. The Contractor shall repair any damage to the existing utilities at no cost to the Government.

<table>
<thead>
<tr>
<th>Signature</th>
<th>Date</th>
<th>Utility Company Name</th>
<th>Utility Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>USAL</td>
<td>8/10/11</td>
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<td>Electric</td>
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<tr>
<td>&quot;</td>
<td>8/14/11</td>
<td></td>
<td>Water and Sewer</td>
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<td>&quot;</td>
<td>8/14/11</td>
<td></td>
<td>Telephone</td>
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<td>&quot;</td>
<td>8/14/11</td>
<td></td>
<td>Fiber Optic</td>
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<td>&quot;</td>
<td>8/14/11</td>
<td></td>
<td>Cable</td>
</tr>
<tr>
<td>Trees</td>
<td>8/15/11</td>
<td>Axis - One-call 800-292-8525</td>
<td>Natural Gas</td>
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</tbody>
</table>

I certify that the location of excavation has been evaluated for clearance of underground utilities as well as 10-foot clearance from overhead power lines.

Signature of Contractor Representative

Date: 8/17/11
## Definable Feature of Work (DFW):

**Excavation**

<table>
<thead>
<tr>
<th>Task</th>
<th>Initial</th>
<th>Follow-Up</th>
<th>Yes</th>
<th>No</th>
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<th>Remarks</th>
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Notes:
Daily Quality Control Report

REPORT NO. 4  SUBCONTRACT NO. W9128F-10-D-0043  Date: Thursday, August 18, 2011

LOCATION OF WORK:  B-47 Plane Crash Site, Dyess AFB, Abilene, TX

DESCRIPTION: Backfilling Activities and Excavation Conformation Sampling

WEATHER CLASSIFICATION:

<table>
<thead>
<tr>
<th>Class</th>
<th>Weather Conditions</th>
<th>Classification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Class A</td>
<td>No interruptions of any kind from weather conditions occurring on this or previous shifts</td>
<td></td>
</tr>
<tr>
<td>Class B</td>
<td>Weather occurred during this shift that caused a complete stoppage of work</td>
<td>Class: A</td>
</tr>
<tr>
<td>Class C</td>
<td>Weather occurred during this shift that caused a partial stoppage of work</td>
<td>Temperature</td>
</tr>
<tr>
<td>Class D</td>
<td>Weather overhead excellent or suitable for work during shift. Work completely stopped due to results of previous adverse weather.</td>
<td>Max 102°F Min. 85°F</td>
</tr>
<tr>
<td>Class E</td>
<td>Weather overhead excellent or suitable during shift but work partially stopped due to previous adverse manner.</td>
<td>Precipitation: None</td>
</tr>
<tr>
<td>Other</td>
<td>Explain:</td>
<td>Inches: 0.0&quot;</td>
</tr>
</tbody>
</table>

1. Work Performed Today:
Josh Phillips (Sullivan/AFS), Jerry Craft (Sullivan/AFS), Mike Marable (EDI), Scott Baing (EDI), Steven Rademacher, Brett Rogers, Mike Gifford, Judy Overby arrived onsite at 0730. A tail gate safety meeting was conducted and short meeting was conducted to discuss events for the day, that included AOI-1 and AOI-2 backfilling activities and excavation conformation sampling.

TCEQ representatives were onsite at 0800 to perform scans of the excavation areas and complete sampling activities. TCEQ rep’s were given a brief safety review prior to entering in the construction zone. TCEQ also invited local and regional representatives to the site.

Ed Kinney Trucking Co. mobilized 2 truckloads of topsoil to the site for use as backfill in the excavated areas. Once onsite the excavation areas were backfilled, raked, and seeded.

Equipment used during backfill activities was cleaned and prepared for demobilization. All involved were off site at 1230.
2. Work Performed Today by Subcontractors:
   Mike Marable and Scott Baing with EDI continued to collect split samples with TCEQ rep's.
   Ed Kinney Trucking Co, mobilized 2 loads of topsoil for backfill.

3. Type and Results of Inspection: (include Satisfactory Work Completed or Deficiencies
   with Action to be taken).
   None.

4. List Type and Location of Tests Performed and Results of These Tests:
   None

5. Verbal Instructions Received:
   None.

6. Corrective Actions Proposed/Taken:
   None.

7. Remarks:
   None.

8. Safety Violations Observed:
   None.

9. CERTIFICATION: I certify that the above report is complete and correct and that I, or my
    authorized representative, have inspected all work performed this day by the contractor and each
    subcontractor and have determined that all materials, equipment, and workmanship are in strict
    compliance with the plans and specifications, except as may be noted above.

    Josh Phillips
    Quality Control Officer
### Daily Tailgate Safety Meeting Log

**Date:** 8/18/11  
**Location:** Abilene, TX  
**Meeting conducted by:** J. Phillips  
**Client:** U.S. Corps of Engineers, Omaha  
**Job No.:** 10-114

**Details of safety meeting presented (use back of sheet if necessary):**

- **Level of Protection:** Low/D
- **Contaminants:** LSA
- **Physical Hazards:** Heavy Equipment, Snakes, Heat
- **Other:**

**Are any permits/clearances required on this day?:**

**Attendees:**

- Josh Phillips
  - Jerry Craft
  - Mike Marable
- Scott Davis
- LT Mike Gifford

**Signature:**

---

**Printed Name:**

**Signature:**

---
## HEAVY EQUIPMENT DAILY INSPECTION CHECKLIST

<table>
<thead>
<tr>
<th>Project Name: B-47 Plane Crash Site</th>
<th>Project Number: 10-114</th>
<th>Client: USACE Omaha</th>
</tr>
</thead>
<tbody>
<tr>
<td>Project: Excavation of Contaminated Soils</td>
<td>Contractor: Sullivan-AFS.</td>
<td>Contract No.: W9128F-10-D-0043</td>
</tr>
<tr>
<td>Equipment Description: Shid Steer</td>
<td>Model No.(s): CAT 279</td>
<td>Serial No.(s):</td>
</tr>
</tbody>
</table>

### CHECKLIST

<table>
<thead>
<tr>
<th></th>
<th>OK</th>
<th>Not OK</th>
<th>N/A</th>
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</thead>
<tbody>
<tr>
<td>1. Fuel</td>
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<tr>
<td>2. Lubrication, engine oil</td>
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<td>3. Brakes</td>
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<td>4. Tires, tracks</td>
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<td>5. Air systems</td>
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<td>6. Horn</td>
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<td>7. Safety guards</td>
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<td>8. Mirrors</td>
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<td>9. Steering mechanism</td>
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<td>10. Cooling water</td>
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<tr>
<td>11. Operation controls</td>
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<tr>
<td>12. Lights and reflectors</td>
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<tr>
<td>13. Windshield wipers, defroster</td>
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<td>14. Backup alarm</td>
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<td>15. Fire extinguisher</td>
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<tr>
<td>16. Seat belts</td>
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<tr>
<td>17. Filters (air, oil, fuel, hydraulic)</td>
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<td>18. Lift arm and bucket</td>
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<td>19. Grab handles</td>
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<td>20. Steps (tread, no slip hazards)</td>
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<td>21. Parking brake</td>
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<td>22. General condition</td>
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Remarks:

Certification: [Signature of Certified Operator]

Date: 8/10/11
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Signature of Certified Operator: [Signature]  Date: 8/18/11
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